Twin Skin HFRA Environmental Assessment – APPENDIX B
Other Issues

Other Issues are defined as those resource issues that may have potential for direct, indirect or cumulative effects caused by implementing the proposed action or no-action alternative, but not with a level of significance to support altering the proposed action.

Development of the "design criteria and mitigations" for the proposed action as discussed in Chapter 2 effectively eliminated (through avoidance) or vastly reduced the potential impacts (through mitigation) for some of the other issues. Additional issues not analyzed in detail include those identified as: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; or 3) conjectural and not fully supported by scientific or factual evidence.

Other Issues include the following, and are discussed to the appropriate level of detail in this Appendix:

OTHER ISSUE #1 –

Threatened, Endangered and Sensitive Plants and Forest Species of Concern

A. Botanical Resource

Issue Indicator – Impact on individual species and reduction of suitable habitat.

No federally listed endangered plant species are suspected to occur on the IPNF, and no federally listed threatened plant species are suspected to occur in Boundary County, in which the project area occurs (USDI 2008). Previously documented populations of dwarf birch and arrowleaf coltsfoot occur in the Twin Skin project area.

Field surveys were conducted in 2006 and 2007. New occurrences of groundpine and arrowleaf coltsfoot were identified in the project area; site-specific buffers from all project activities were established by the project botanists. Marginally suitable habitat for sensitive moonworts (*Botrychium* species) occurs in the project area and may be impacted by project activities, with no trend to federal listing or loss of population or species viability expected to occur. A small amount of suitable habitat for clustered lady's slipper (a sensitive species) and pine broomrape (a Forest species of concern) also occurs in the project area and may be impacted by project activities; however, no trend to federal listing or loss of population or species viability would occur from project implementation. Results of field surveys and a detailed rare plants report are in the project file.

B. Wildlife Resource

Issue Indicator – Impact on individual species and reduction of suitable habitat.

Wildlife: Biological Assessment and Report - Including Threatened, Endangered and Sensitive Species

File Code: 2670 Date: February 15, 2008

Ref: Biological Assessment, *wildlife*, Twin Skin HFRA Project

To: Linda McFaddan, District Ranger

Introduction

Threatened and Endangered species are managed under authority of the Federal Endangered Species Act (36 U.S.C. 1531-1544) and the National Forest Management Act (16 U.S.C. 1600-1614). The Endangered Species Act requires that Federal agencies ensure all actions that they "authorize, fund, or carry out" are not likely to jeopardize the continued existence of any threatened or endangered species.

USDA Forest Service Policy (FSM 2670) requires a review of programs and activities, through a biological assessment, to determine their potential effects on threatened and endangered species. The biological assessment process is intended to analyze and document activities necessary to ensure proposed activities will not jeopardize the continued existence or cause adverse modification of habitat for listed species.

Project Area

Location - The Twin Skin Healthy Forest Restoration Act (HFRA) project area encompasses approximately 4200 acres of the lower Moyie River watershed and approximately 400 acres of the upper Kootenai River watershed within the Purcell Mountains of northern Idaho. It includes all or portions of Sections 19, 20, and 29-32 of T63N. R.3E, Sections 24, 25, 35 and 36 of T63N. R.2E, and Sections 1 and 2 of T62N. R.2E, of the Boise Meridian in Boundary County, Idaho and is located on the Bonners Ferry Ranger District, of the Idaho Panhandle National Forest.

Background - Approximately 98% of National Forest System Lands (NFS) within the project area are forested and of this, 76% consist of sawtimber sized trees including 2% that presently have a stand structure characteristic of old growth. The area includes approximately 14 miles of stream including the Moyie River along the western boundary,

Skin Creek along the south and east boundaries and Deer Creek along the northern boundary of the project area. Lands within 100 meters of a stream, which would include all riparian habitat occurs on approximately 9% of the area. Also there are approximately 100 acres of National Wetland Inventory (NWI) wetlands scattered across the project area, most of which are along the Moyie River, Skin Creek or on low-elevation private land. Greater than 80% of the project area is in mid to low elevation habitat and only approximately 9% of the project area occurs above 3500 ft., all of which is on Solomon Mountain in the eastern third of the project area. Conversely, all the low elevation habitat (<2500 ft) is associated with the Moyie River and lower Skin and Deer creek, in the western half of the project area, with mid-elevation (2500-3500 ft) habitat between these two areas. Over 75% of the project area is on slopes <40% and largely due to the proximity of private land in and around the project area, motorized access is good the project area has a total road density of 7.6 mi/mi^2 and an open road density of > 4 mi/mi^2. As a result there is very little remote habitat and presently <15% of the project area is greater than ¼ mile from an open road.

Proposed Action

Much of the lands in and around the project area are private and this area is considered a wildland urban interface (WUI). Historically periodic wildfires maintained open stands of ponderosa pine, western larch, Douglas fir and white pine and prevented fuels from building up in the understory. However due to decades of fire suppression, much of the project area is now characterized by dense stands of Douglas fir and grand fir, which have resulted in increased levels of insect and disease related mortality and increased fuel loading in many stands. The crowded nature and increased levels of dead wood that predominates in many of these stands has created a hazard for intense wildfire within the WUI. Such a fire would put private lands and residences, as well as wildlife and aquatic habitat at risk.

The Twin Skin HFRA project proposes treatments on approximately 713 acres of vegetation on National Forest System (NFS) land within the Twin Skin project area. Objectives of the project are to 1) reduce hazardous fuels, thereby improving our ability to suppress wildfires within a wildland-urban interface area (WUI) and 2) restore vegetation within the project area towards conditions that would be less susceptible to catastrophic fire, while maintaining and restoring habitat for fish and wildlife species.

The proposed action is summarized in Table 1 and would:

- Treat hazardous fuels and create sustainable stand compositions and structures that are adapted to fire on approximately 713 acres of National Forest System lands using a variety of silvicultural and slash disposal tools.
- Include 18 treatment units that utilize commercial thinning, sanitation salvage, group selection, shelterwood, irregular shelterwood, or free selection to achieve the desired conditions for the units. Logging systems will include a mixture of ground-based and skyline logging systems, which will be dictated by site specific terrain,

access and soil conditions. Slash and the hazards from fire will be reduced by prescribed burning, or by piling and burning.

- Pre-commercially thin 22 acres on one site to reduce competition and promote desired tree species.
- Improve and maintain the transportation system (roadside and surface maintenance, etc.) on approximately 14 miles of roads that will be used as haul routes including Forest roads 435, 2215 and associated spurs, 2549, 627, 2269, 2269A and 2534.
- Construct 1.5 miles of temporary roads that will be used to access timber and facilitate burning.

Table 1: Treatment Summary

Treatment Type	Acres / Miles
Even-aged Regeneration Cuts	
Irregular Shelterwood (ISW)	34
Shelterwood (SW)	17
Total Regeneration Cuts	**51**
Even and Uneven-aged Partial Cuts	
Commercial Thin/Sanitation Salvage (CT/SS)	273
Group Selection/Commercial Thin (GS/CT)	80
Weed Release/Improvement Cut (WR/IC)	100
Pre-commercial Thinning (PRC)	22
Free Selection (FS)	187
Total Partial Cuts	662
Total Acres Treated	**713**
Logging System	
Ground-based	412
Skyline	278
Treatment Type	**Acres / Miles**
Fuels Treatment	
Grapple Pile	394
Grapple Pile/Underburn	198
Underburn	98
Total Acres of Fuels Treated	**690**
Transportation Treatments	
Road maintenance/improvement	14 mi.
Temporary Road Construction	1.5 mi.

Timing and Duration of Activity - The activity will be under a five-year timber sale contract beginning in 2008. Prescribed burning would be implemented within one to two years following harvest.

Pre-field and Field Reviews

Proposed treatment units and surrounding areas were reviewed by a Wildlife Biologist and wildlife technicians during the 2006 and 2007 field seasons in order to identify possible wildlife issues and determine existing use by featured species. Prior to this, the District wildlife atlas was consulted to help determine historic use patterns, and habitat suitability models were used to identify potential habitat for various species.

Listed Species

On August 9, 2007 the U.S. Fish and Wildlife Service provided the Idaho Panhandle National Forests with a listing of threatened and endangered species that may occur on the Bonners Ferry Ranger District. These species include gray wolf (*Canis lupus*), woodland caribou (*Rangifer tarandus caribou*), Canada lynx (*Lynx canadensis*) and grizzly bear (*Ursus arctos*).

Table 2 summarizes species status, potential adverse effects and species specific determinations for the gray wolf, woodland caribou, Canada lynx and grizzly bear. Based on the known distribution of these species, habitat requirements, and habitat availability, only the gray wolf and grizzly bear may be impacted by the proposed action and as a result, only these species will be discussed in detail in this assessment.

Summary of Effects Analysis and Determinations

Table 2. Summary of Effects

Species	Species or Habitat Present?	Species or Habitat Potentially Affected?	Likelihood of Adverse Effects?	Determination of Effects
Endangered				
Gray Wolf	Yes	Yes	Low	**May Affect, Not Likely to Adversely Affect**
Woodland Caribou	No	No	None	**No Effect**

Threatened				
Canada Lynx	No	No	None	**No Effect**
Grizzly Bear	Yes	Yes	Low	**May Affect, Not Likely to Adversely Affect**

Species Not Discussed in Detail

Woodland caribou

The woodland caribou population is generally found above 3000 feet elevation in the Selkirk Mountains in Engelmann spruce/subalpine fir and western red cedar/western hemlock forest types. They are highly adapted to upper elevation boreal forests and do not occur in drier low elevation habitats except as rare transients. Seasonal movements are complex and normally occur as altitudinal patterns, moving to traditional sites for different seasons. The population is threatened by habitat fragmentation and loss, and excessive mortality from predators and illegal human take (USDI 1994). The recovery area for the population is the Selkirk Mountains of northern Idaho, northeastern Washington and southern British Columbia, Canada.

The project area is not within a designated Woodland Caribou Management Unit (CMU), and no caribou have been documented in the vicinity in recent years. In addition, 77% of the project is located below 3,000 ft elevation, and was probably not heavily utilized historically by woodland caribou. For these reasons there are no direct, indirect or cumulative effects to this species or its habitat anticipated and the project would have **no effect** on the woodland caribou.

Canada lynx

The Canada lynx was listed as Threatened on March 21, 2000. Lynx populations in Alaska and most of Canada are generally considered stable to slightly dropping. The conservation of lynx populations is the greatest concern in the western mountains of the United States because of the peninsular and disjunct distribution of suitable habitat at the southern periphery of the species' range. Both historic and recent lynx records are scarce, which makes identifying range reductions and determining the historical distribution of stable population's difficult (Koehler and Aubrey 1994).

Important risk factors that can impact lynx populations include alteration of forest habitats, expansion of the range of competitors, and increased levels of human access into lynx habitat. The Canada Lynx Conservation Assessment and Strategy (LCAS) (Ruediger et al. 2000) and Northern Rockies Lynx Managaement Direction (USDS 2007) direct agencies to delineate lynx analysis units (LAUs) to evaluate and analyze effects of planned and on-going projects on lynx and their habitat, and provide guidance for

addressing these risk factors. Both snow conditions (influenced by elevation and aspect) and vegetation types are important factors to consider in defining lynx habitat.

There is recent (2001) documentation of lynx tracks approximately two miles north of the project area. However the project area is not within a Lynx Analysis Unit (LAU) and is not along a linkage corridor between isolated LAUs. Also the area consists primarily of low elevation habitat not preferred by lynx and for these reasons, there are no direct, indirect or cumulative effects to this species or its habitat anticipated and the project would have **no effect** on the Canada lynx.

Species Discussed in Detail

Gray wolf

The northern Rocky Mountain wolf (a subspecies of the gray wolf) was listed as endangered in 1973. However, based on enforcement problems and a trend to recognize fewer subspecies of wolves, the full species was listed as endangered throughout the entire lower 48 states, except Minnesota, in 1978 (USDI 1987). In the past, substantial declines in numbers of wolves resulted from control efforts to reduce livestock and big game depredations. By the 1940's, the Rocky Mountain wolf was essentially eradicated from its range. In 1994, final rules in the Federal Register made a distinction between Idaho wolves that occur north of Interstate 90 and wolves that occur south of Interstate 90. Gray wolves occurring north of Interstate 90 are listed as endangered species and receive full protection in accordance with provisions of the Endangered Species Act.

Wolves are highly social animals requiring large areas to roam and feed. Conservation requirements of wolf populations are not fully understood, but the availability of prey and limiting the risk of human-caused mortality are considered important components (USDI 1987). The Fish and Wildlife Service identified key wolf habitats as those with: 1) a sufficient, year-round base of big game, 2) suitable and somewhat secluded denning and rendezvous sites, and 3) sufficient space with minimal exposure to humans. Wolves generally den on southerly aspects of moderately steep slopes in well-drained soils (or rock caves/abandoned beaver lodges), usually within 400 yards of surface water and at an elevation overlooking surrounding low-lying areas. Rendezvous sites are characterized by complexes of meadows and adjacent hillside timber, with surface water nearby (USDI 1987).

The Twin Skin HFRA project occurs north of Interstate 90. Gray wolves occurring in Idaho north of Interstate 90 are listed as endangered and receive full protection in accordance with provisions of the Endangered Species Act. The project area lies within the Northwest Montana Wolf Recovery Area. During the 2007 field season, a female wolf evidently denned approximately ½ mile east of the project area on a ridge above Solomon Lake. This female is believed to be part of a group that has been documented on the Kootenai NF in the Meadow Creek area, approximately seven miles east of the

project area. To date, a den location and reproduction of this un-named group has not yet been confirmed, although efforts are on-going to better document use of the area by this group (personal communication between Brett, Lyndaker, Wayne Kasworm and Wayne Wakkinen 2007). In addition to the Meadow Creek group, there is an established pack in Boulder Creek, 10 miles south of the project area.

Due to the amount and distribution of private land in and around the project area, its proximity to Moyie Springs and recreational use in the area and the relatively high road density (7.6 miles/mi^2), the area receives considerable human use. Also over 50% of existing roads are open to year round use and >80% of the project area is within ¼ mile of an open road. Collectively, the interspersion of private land and residences, total road density and large number of open roads, would make the area less preferred as den or security habitat. However the area supports populations of moose, elk and white-tailed deer as potential prey items and it is likely that portion of the project area lies within the home range of the Meadow Creek group.

Direct and Indirect Effects

Project activities with the potential to affect the gray wolf or its habitat include timber harvest, temporary road construction, road reconstruction and maintenance and proposed burning. Additionally in the event that incidental residual tree mortality occurs as a result of windstorms, ice damage, fire or insects and disease, some salvage harvest may occur in the treatment units and associated roadsides. There may also be some collection of special products from pre-commercial thinning sites. Although disturbance to wolves could result from the above activities, effects will be short term in nature. Additionally considering that there will be no increase in permanent open roads, there are no anticipated increases in road related mortality or conflicts with humans. Also because there will be no change in access, there will be no long-term direct impacts or loss of existing security habitat.

Timber harvest and associated fuels treatments may represent a persistent source of disturbance to gray wolves and their prey, but this impact would likely be confined to a few years in the area affected, after which use would resume. Currently, it is unclear to what extent the Solomon Lake group is using the Twin Skin project area. While there is a possibility that this group could be disturbed at den or rendezvous sites by project activities, because of the high open road density and yearlong human use in the area, it is unlikely that most of the project area would be utilized for anything other than foraging or transitory use. However in order to reduce the risk of disturbance and minimize impacts, the following conservation recommendations will be implemented:

- *Any gray wolf den or rendezvous sites identified in or adjacent to proposed activity areas will be spatially and/or temporally buffered as appropriate. This would include:*
    - *No project activities within one (1) mile of occupied sites from April 1-July 1 for den sites and from July 1-August 15 for rendezvous sites. Upon*

review by the Forest Level 1 team, these distances could decrease based on topographical characteristics at each site.

- *Due to their proximity to recent wolf sightings, all timber harvest in the Solomon Lake Units (Units 16-18) will be restricted from April 1 through August 15.*

It is assumed that as additional information becomes available, appropriate conservation requirements will be updated and applied as necessary.

Indirect effects can occur from any activity that may result in habitat changes to the gray wolf and vary depending on the type of treatment. Approximately 21% and 2% of the NFS lands within the project area will receive a partial harvest or regeneration timber harvest treatment respectively (See Table 1), whereas burning and fuels treatments will occur on all sites receiving harvest, or approximately 23% of the NFS lands within the project area. Although there would be a loss of hiding cover, particularly in regenerated areas, over 90% of the treatments involve partial harvest activities. Because these treatments maintain predominately sawtimber sized trees with a canopy closure of 50% or more, they will continue to offer some degree of hiding cover. Also following treatment, lands containing predominately sawtimber sized trees will continue to exist on almost 70% of the project area and suitable cover conditions will continue to predominate and will be well distributed across the project area.

Although there would be a loss of hiding cover, particularly in regenerated areas, and some behavioral avoidance by both wolves and big game during implementation, because treatments at any site will be completed within one to two seasons, it is anticipated that animals will re-occupy the area shortly after treatment and any effects will be short-term in nature. Long-term effects of timber harvest and prescribed burning would be an increase in the quality and quantity of big game forage on sites treated. As a result, it is anticipated that changes in habitat resulting from this project would likely create a net benefit to big game species, and consequently to wolves. This increased availability of big game habitat is consistent with Forest-wide direction, which calls for maintaining high number of prey species in areas of reported wolf occurrence (USDA-FS 1987).

While logging will reduce cover and structure on treatment sites, over the long term treatment would encourage growth of large diameter larch, white pine and Douglas-fir and this increase in stand diameter, as well as improved stand structure, will improve habitat for the gray wolf and its prey. Proposed timber harvest would also make measurable reductions in fuel loading and reduce the possibility for stand-replacing fire, which could result in a long-term loss of cover for the gray wolf.

Cumulative Effects

Potential cumulative effects (CE) to the gray wolf will be evaluated by looking at all past, present and foreseeable future actions on federal and non-federal lands within the project area boundary. The project area was chosen to asses cumulative effects, because the

levels of anticipated activities and habitat conditions are representative of those on similarly managed lands.

Since there is no new road permanent construction proposed or changes in road management on NFS lands, the primary factors affecting the gray wolf and its habitat include timber harvest and prescribed burning. Since 1970, timber harvest treatments have been implemented on approximately 50% of the project area. Also the pattern of past cutting on non-federal lands is expected to continue and by 2018, which is the period of time it may take to complete all treatments, it is estimated that approximately 70% of the project area received some form of timber harvest. Although it is estimated that approximately 67% of the project area will be characterized by stands that contain predominately sawtimber sized trees (including both mature and immature sawtimber) and a canopy closure of 50% or more, whereas up to approximately 22% of the area would have been affected by some form of regeneration treatment. Cumulative burning will total 23% of the analysis area and will occur on the same sites as those proposed for future timber harvest.

Current activities such as firewood collection, dispersed recreation and occasional noxious weed treatment along road corridors will continue. While these activities may be a short-term, localized source of disturbance to wolves, much of this will be concentrated along open roads and the level of disturbance is not anticipated to increase.

Based on the above analysis, approximately 67% of the project area will be characterized by forested stands that contain predominately sawtimber sized trees with a canopy closure of 50% or more. Also because there will be no increase in permanent roads or changes in road management, existing security habitat will remain intact under this alternative. Treatments proposed under this alternative will continue to provide adequate levels of forage and cover to maintain big game populations within the project area and there is no anticipated change in the wolf prey base.

Determination of Effect

The most important criteria for wolf management are the maintenance of an abundant prey base and minimizing the risk of illegal mortality. As a result, virtually any area that has sufficient prey and adequate protection from human-caused mortality could be considered potential gray wolf habitat (USDI 2003). With implementation of the above conservation recommendations to protect potential den and rendezvous sites and reduce disturbance related impacts in the Solomon mountain area, and considering there will be no new permanent open roads and existing security habitat will be retained, it is unlikely that the Twin Skin project will increase the vulnerability of wolves or adversely influence their ability to use the area. Further, the increased prey availability that will result due to implementation of the project will maintain or improve foraging habitat across the project area. For these reasons and considering the ability of the gray wolf to occupy a wide range of habitats and thrive under a variety of land uses (USDI 2003), the Twin Skin project **may affect, but is not likely to adversely affect** gray wolf or their habitat.

Grizzly bear

The grizzly bear was listed as Threatened in 1975. It was originally distributed in various habitats throughout western North America. Today, it is confined to less than two percent of its original range and represented in five or six population centers south of Canada, including the Cabinet-Yaak and Selkirk Ecosystems that are located in northeastern Washington, northern Idaho and northwestern Montana. Habitat loss and direct and indirect human-caused mortality are related to its decline (USDI 1993).

The U.S. portion of the Selkirk and Cabinet-Yaak Ecosystems is divided into grizzly bear management units (BMUs) ranging in size from ~30-160 square miles. The Idaho Panhandle, Kootenai and Colville National Forests, and the Idaho Department of Lands administer these BMUs. BMUs are designed to approximate the average home range of a female grizzly bear (~100 mi^2), facilitate documentation of bear numbers and distribution, and track cumulative effects within the ecosystem (Christensen and Madel 1982).

The Grizzly Bear Recovery Plan (USDI 1993) indicates that the most important element in grizzly bear recovery is reducing mortality risk. This is a reflection of an area's ability to support grizzly bears based on the quality of the habitat and the type/amount of human disturbance imposed on the area. Controlling and directing motorized access is one of the most important tools in achieving habitat effectiveness and managing grizzly bear recovery (USDI 1993). By controlling motorized access, certain objectives can be achieved including minimizing human interactions and potential grizzly bear mortality, reducing displacement from important habitats, and minimizing habituation to humans. This strategy involves achieving specified levels of "core" habitat (areas >500 m from drivable motorized routes) and road densities.

The Twin Skin project area encompasses approximately 4600 acres, of which approximately 600 acres is in the northeast portion of the Twin Skin project area are located within the Keno BMU. The Keno BMU is in the Cabinet-Yaak Recovery Zone, which is approximately 51,236 acres in size, including 21,000 acres on the IPNF. Conservation recommendations identified in the 2001 Amended Biological Opinion for the Continued Implementation of the IPNF Land and Resource Management Plan (USDI-FWS 2001) include maintaining established levels of core habitat, Total Motorized Route Density >2 mi/mi^2 (TMRD) and Open Motorized Route Density >1 mi/mi^2 (OMRD). Table 3 displays the current standard and existing condition related to these recommendations for the Keno BMU.

Table 3. Keno BMU existing condition and proposed standards (%).

	Core Habitat[1]	OMRD[2]	TMRD[3]
Existing (2007) condition	59	34	24
2001 BO standard	55	33	26

[1]Percent of BMU >500 m from drivable motorized routes.
[2]Open Motorized Route Density >1 mile/square mile (percent of BMU)
[3]Total Motorized Route Density >2 miles/square mile (percent of BMU)

Although the Keno BMU presently exceeds the standard for core habitat and TMRD, it currently does not meet the OMRD standard established in the 2001 Biological Opinion (USDI-2001). Total and open road densities for both the project area and that portion of the BMU within the project area are three to four times higher than the recommended standard and only 69 acres of core habitat currently exist within the Twin Skin project area. Considering the level of roading that presently occurs and the associated human activity, use of the project area by bears is expected to be low, with only periodic sightings or sign of grizzly bear activity. The nearest recent observation was a young male that was trapped in 2003 at the Deer Creek refuse site, immediately adjacent to the southeast corner of the project area.

Because much of the Twin Skin project area occurs at lower elevations below 3000 ft, it typically receives less snowfall and low elevation southerly and easterly aspect slopes green-up early in the year and can provide abundant spring forage for grizzly bear. However potential forage species dry out and lose palatability fairly early in the season. Also due largely to the suppression of wildfires, much of the project area consists of mesic habitats that generally contain a dense canopy layer of small diameter (<8" dbh) trees, that reduce the amount of herbaceous vegetation in the understory. These features, in combination with the fact that treatment areas are geographically situated between spring habitat and high elevation summer habitat, suggest that the greatest potential for grizzly bear use within the Twin Skin project area occurs in the spring. The larger total and open road density, as well as increased levels of human activity that characterizes much the project area, would reduce the suitability as grizzly bear habitat. For these reasons, the area would be considered primarily spring habitat for grizzly bears and any use in the area would be expected to be short-term in nature.

Direct and Indirect Effects

Project activities that have the potential to impact grizzly bears include timber harvesting, road re-construction and maintenance and prescribed burning activities (See Table 1). Additionally in the event that incidental tree mortality occurs as a result of windstorms, ice damage, fire or insects and disease, some salvage harvest may occur in treatment units and associated roadsides. There may also be some collection of special products from pre-commercial thinning sites. The effects of these activities on grizzly bears can be both short and long term, with short term impacts occurring within the next 5-10 years during implementation, whereas long-term effects include changes in forest structure (reduction

of cover and increased foraging habitat) and can last for decades. Since this proposal will not permanently increase motorized route miles, disturbance effects are limited to the short-term impacts of road related activities, timber harvesting and subsequent fuels treatment. The level of potential disturbance is influenced by a number of factors including: 1) the intensity and duration of activity, 2) the correlation of the activity with seasonal habitat preferences of bears, 3) the association of activity with quality habitat, and 4) cumulative impacts from other sources of disturbance.

A total of 199 acres of commercial thinning/sanitation salvage harvest will occur within the Keno BMU (Units 16-18). In order to avoid displacement of bears during the spring season, when bears are most likely to be present, the following design features will be implemented to minimize potential disturbance to bears within the BMU:

- *In order to minimize disturbance to grizzly bears during project implementation, all timber harvest in units 16-18, will take place outside the spring bear season (April 1 to June 15).*

Indirect effects or changes in habitat conditions that result due to proposed timber harvest will be an opening up of the canopy and development of herbaceous and woody vegetation in the understory. A mature overstory would be retained (@ 50% crown closure) and all sites would continue to provide some cover, as well as increased levels of forage. A total of 53 acres (Units 16 and 17) would be treated with ground based systems, while the remaining 146 (Unit 18) acres would be logged using a mix of tractor (50 acres) and skyline yarding (96 acres). All units are within the 500 m influence zone of drivable roads, outside of core habitat. . Because of the importance of minimizing human/bear interaction, the type of treatment and the proximity of treatments to open roads is a consideration. The 2001 BO requires that at least one sight distance be maintained between open roads and regeneration harvest units. There is no regeneration harvest proposed within the BMU. While treatments will occur along 0.6 miles of open road within the BMU, all treatments involve partial harvest activities that will retain a predominately sawtimber overstory on the site. Also the road is on a sideslope where topography further restricts sight distance and it is anticipated that adequate cover will be retained to reduce the visibility of bears from open roads. Also because there is no regeneration harvest proposed, treatments are consistent with the Terms and Conditions related to providing a vegetative screen outlined in the 2001 BO.

All sites receiving timber harvest treatment (199 acres) will also have fuels treated with a combination of grapple piling and burning, and underburning. Because this treatment will occur in the spring, it is possible that bears in the area could be disturbed and forced to move out of the area. Although because of the short duration of the treatment and in-frequent bear use, and considering all treatment areas are within 500 meters of an open road, there is a low probability of grizzly bear presence and displacement within the treatment areas.

Core habitat is an important consideration in managing grizzly bear habitat and is necessary to provide a sanctuary for grizzly bears that is relatively free of human disturbances, in order that bears may meet their life requisites for survival and

reproduction. Because all treatments are within 500 meters of an open road, there will be no reduction in core habitat.

Within the Keno BMU there are 2.4 miles of road reconstruction proposed and this work, as well as road maintenance and haul may result in disturbance to bears. However all work will occur on existing roads and with implementation of the following mitigation measures, potential disturbance will be minimized:

- *All road reconstruction and road maintenance activities that take place within the Keno BMU will occur outside the spring bear season (April 1 to June 15).*
- *Roads 2549 UH and 2549UE will be made impassable to public traffic during and after implementation of the Twin Skin project.*

All road re-construction will occur on existing roads. Also because all treatments are within 500 meters of open roads and with implementation of the above mitigation measures to keep roads closed during and after project implementation, there will be no change in open road densities or reduction of core habitat. As a result there will be no change in access and treatments will adhere to standards established in the 2001 Biological Opinion (USDI 2001).

Outside of the BMU, timber harvest, burning and temporary road construction will occur on 514 acres, 492 acres and 1.5 miles respectively. Although disturbance to bears outside of the recovery zone is a possibility, incidental use is infrequent. Also considering 80% of the proposed treatments outside of the BMU occur within 500 meters of open roads, potential for disturbance related effects outside of the BMU is remote. Over 90% of this harvest involves thinning and selection harvest and because treatment will maintain a mature overstory and increase spring forage (described above) on the site, there will be no significant changes in bear habitat outside of the Keno BMU.

While logging will reduce cover and structure on treatment sites, over the long term, treatment would encourage growth of large diameter larch, white pine and Douglas-fir and increase stand diameter, as well as improve stand structure. These changes in structure, including increased levels of large diameter dead wood and greater understory diversity would be expected to provide long-term improvement to grizzly bear habitat. Proposed timber harvest would also make measurable reductions in fuel loading and reduce the possibility for stand-replacing fire, which could result in a loss of grizzly bear cover.

Cumulative Effects

Past activities within the Keno BMU that have the greatest potential to adversely affect the grizzly bear include primarily road construction and management. While the short-term effect of these activities is not known, long term effects have included a reduction in core habitat and an increase in open and total road density to levels identified in Table 3. In addition to past activities within the Keno BMU, current activities such as firewood

collection and dispersed recreation will continue and may be a short-term, localized source of disturbance to bears. However these activities will be concentrated along open roads and the level of disturbance is not expected to increase.

Past levels of timber harvest on non-federal lands are expected to continue at current levels and based on harvest that has occurred within that portion of the Keno BMU within the project area and aerial photographs, it is anticipated that that preferred cover and forage conditions will continue to be widely available across the BMU. As discussed above, there is currently a high total and open road density and many of the non-federal lands within the BMU are heavily roaded. As a result it is anticipated that future timber harvest on these lands will largely utilize the existing road system. Additionally the USFS would have to manage roads to offset any additional road building on other ownerships and for these reasons and there is little change in core habitat or road densities anticipated.

Determination of Effect

While limiting seasons and duration of activities is expected to reduce the potential for disturbance and/or displacement, there are no guarantees that bears will not be present and affected during implementation of the Twin Skin project. However based on the analysis presented above and the following rationale, the risk of adverse affects is considered to be extremely remote:

- Implementation of site specific conservation recommendations will reduce the likelihood that a grizzly bear is harassed or harmed as a result of proposed activities. Also any displacement is expected to be short term in nature.
- Due to high total and open road density and level of human activity, use by the grizzly bear is infrequent and seasonal in nature.
- Within the Keno BMU there will be no change in access or loss of core habitat and implementation of Alternative 2 is consistent with Terms and Conditions established in the 2001 Biological Opinion (USDI 2001).

As a result, implementation of the Twin Skin project **may affect, but is not likely to adversely affect** the grizzly bear or its habitat.

Conservation Measures to Reduce or Avoid Adverse Effects

Gray wolf

- *Any gray wolf den or rendezvous sites identified in or adjacent to proposed activity areas will be spatially and/or temporally buffered as appropriate. This would include:*

    - *No project activities within one (1) mile of occupied sites from April 1-July 1 for den sites and from July 1-August 15 for rendezvous sites. Upon review by the Forest Level 1 team, these distances could decrease based on topographical characteristics at each site.*

- *Due to their proximity to recent wolf sightings, all timber harvest in the Solomon Lake Units (Units 16-18) will be restricted from April 1 through August 15.*

Grizzly bear

- In order to minimize disturbance to grizzly bears during project implementation, all timber harvest in units 16-18, will take place outside the spring bear season (April 1 to June 15).

- All road reconstruction and road maintenance activities that take place within the Keno BMU will occur outside the spring bear season (April 1 to June 15).

- Roads 2549 UH and 2549UE will be made impassable to public traffic during and after implementation of the Twin Skin project.

All listed species

- If any threatened, endangered, or sensitive species are located during project layout or implementation, management activities would be altered, if necessary, so that proper protection measures can be taken. Timber sale contract provisions that require the protection of Threatened, Endangered and Sensitive Species would be included in the timber sale contract.

Statement of Findings

Based on the above analysis, I conclude that the Twin Skin HFRA project would have **no effect** on the woodland caribou and Canada lynx and that it **may affect, but is not likely to adversely affect** the gray wolf and grizzly bear.

Twin Skin HFRA Environmental Assessment – APPENDIX B
Other Issues

Prepared by: _____
Date:_____
Scott L. Reitz
TEAMS Wildlife Biologist

Approved by:_____
Date:_____
Tim Layser
North Zone Staff Wildlife Biologist

Twin Skin HFRA EA

Wildlife Report
and
Biological Evaluation

Prepared by:

Scott L. Reitz, Wildlife Biologist
USDA Forest Service, TEAMS Enterprise

for:

Bonners Ferry Ranger District
Idaho Panhandle National Forests

February 2008

Abstract

This report analyzes the effects of the Twin Skin Fuels Reduction Project on wildlife and wildlife habitat within and adjacent to the Twin Skins project area. The proposed project would treat approximately 713 acres of National Forest land and this report discusses the changes in wildlife habitat conditions that would occur under each of the alternatives considered. Potential effects at the landscape and site or stand scale were evaluated. Although wildlife distribution and use may shift as preferred habitats either become available or are lost, based on the analysis provided, there will be no significant effects to the wildlife resource under any alternative. Additionally, habitat for wildlife that presently use the project area would continue to be available and viable populations of local wildlife will be maintained. There are no anticipated effects under any alternative that would contribute in a trend towards Federal listing for Regionally Sensitive species, adversely affect any threatened or endangered species and there will be no population-level effects or threats to management indicator species (MIS). As a result this project complies with the Forest Plan (USDA 1987) and all regulatory direction related to wildlife.

Introduction

This report addresses the impacts and benefits of the Twin Skin HFRA EA Project on wildlife and wildlife habitat in a portion of the Idaho Panhandle National Forests (IPNF). The project area is located within Sections 19, 20, 29-32 of T63N, R3E, Sections 24, 25, 35 and 36 of T63N, R2E and Sections 1 and 2 of T62N, R2E of the Boise Meridian, on the Bonners Ferry Ranger District in Boundary County, Idaho. The area encompasses roughly 4600 acres and is located @ 7 miles northeast of the city of Bonners Ferry, Idaho. The project is in the vicinity of Deer Creek, which is the northern boundary, Skin Creek along the southeast boundary and the Moyie River, which is the western project area boundary. The project area is surrounded by private land and is considered a wildland-urban interface (WUI). The Bonners Ferry Ranger District proposes to treat vegetation to reduce the threat of wildfire to life and property and this project would implement fuels reduction, timber stand maintenance, and restoration treatments. The treatments include removing live trees, reducing brush, prescribed burning, piling and burning woody debris, and up to 1.5 miles of temporary road construction. This report documents how these treatments are expected to affect wildlife and wildlife habitat.

The analysis presented considers regulatory direction related to the wildlife resource, evaluates potential effects on species whose viability is considered most at risk (Threatened, Endangered and Sensitive species (TES), and evaluates effects on Management Indicator Species (MIS), or species that are monitored across the Forest to assess effects of management. Because wildlife distribution and use is determined by both site specific and landscape level conditions, a multi-scale analysis is presented that looks at changes in habitat conditions on specific stands proposed for treatment (fine filter analysis), as well as landscape considerations (coarse filter analysis), such as the availability of habitat within and adjacent to the project area.

Regulatory Framework

Regulatory direction applicable to the management of wildlife resources includes:

- Multiple-Use Sustained-Yield Act of 1960
- National Environmental Policy Act (NEPA) of 1969 (as amended)
- Endangered Species Act (ESA) of 1973 (as amended)
- Forest and Rangeland Renewable Resources Planning act (RPA) of 1974 (as amended)
- National Forest Management Act (NMFA) of 1976 (as amended)
- Healthy Forests Restoration Act (HFRA) of 2003
- Executive Order 13186 (Migratory Bird Treaty Act)
- Idaho Panhandle National Forests Forest Plan (USDA Forest Service 1987)
- Forest Service policy regarding wildlife (FSM 2600)

In addition to the regulatory framework, the best available science was considered in preparation of this report. However, the best available science might vary over time and across scientific disciplines. As a result this report identifies methods used, references

scientific sources relied on, and discloses incomplete or unavailable information, scientific uncertainty, and risk.

Forest Plan Direction

The Idaho Panhandle National Forests Forest Plan contains specific goals, objectives, management direction and standards related to management of the Forests' wildlife resources. Forest-wide objectives, as well as Management Area (MA) direction, or direction to different areas of the Forest are described below.

Forest-wide Goals

The Forest Plan (p. II-1) contains the following goals regarding wildlife populations and habitat including:

- Provide for a diversity of plant and animal communities,
- Manage vertebrate wildlife habitat to maintain populations of all species,
- Manage big game habitat to achieve goals of Idaho Department of Fish and Game,
- Manage habitat for threatened, endangered and sensitive wildlife species.

Forest-wide Objectives

The Forest Plan contains the following objectives for management of wildlife and wildlife habitat.

- Maintain 10% old growth on the Forest and 5% in each old growth management unit (p. II-5)
- Provide habitat to maintain viable populations of vertebrae species (p. II-5)
- Manage white-tail deer winter range to provide a mosaic of cover and forage (p. II-6).
- Contribute to the conservation and recovery of listed species (p. II-6)
- Manage sensitive species to prevent the need for Federal listing. (p. II-6)

Forest-wide Management Direction

The following management area direction is related to wildlife and wildlife habitat within the Twin Skin project area.

Approximately 50% of the project area consists of timberlands within big game winter range (MA's 3 and 4). Management goals in these areas are aimed at providing adequate forage to support big game habitat needs through scheduled timber harvest and providing permanent forage areas. Up to 20% of these areas may be managed for forage production while retaining areas for thermal cover. Within white-tailed deer winter range, smaller units would be emphasized and Roads may be closed to meet wildlife needs (p. III-18). Approximately 20% of the project area consists of timberlands within identified grizzly bear habitat (MA's 2 and 3). Management goals include providing cost effective commercially valuable timber products, while minimizing human conflicts (pp. III-7 and III-12). In accordance with grizzly bear guidelines, silviculture can be used to improve grizzly bear habitat (p. III-8 & 13) and is to be scheduled to ensure security habitat is maintained (p. III-9). The remaining 30% of the project area lies within MA 1, which

provides for long-term growth and production of commercially valuable wood products on those lands that are suitable for timber production.

Methodology for Analysis

Multiple field reviews were conducted during the spring, summer and fall of 2007 (see project record). The following District and Forest wildlife records were reviewed for the preparation of this document:

- U.S Fish and Wildlife Service (USFWS) (USDI Fish and Wildlife Service 2007) list of federally threatened and endangered species in the Idaho Panhandle National Forests
- Region 1 Sensitive Species list
- IPNF Management Indicator Species (MIS) list
- Idaho Fish, Wildlife and Game website

Field survey data was also obtained from various surveys (see project record) conducted within the project area and surrounding vicinity.

The appropriate methodology and level of analysis needed to determine potential effects are influenced by a number of variables including presence of species or habitat, the scope and nature of the activities associated with the proposed action and alternatives, and potential risks that could ultimately result in adverse or favorable effects. The screening process used is tiered to the following documents and uses a variety of information including scientific literature, resource inventories, and sighting records, including but not limited to:

- Idaho Panhandle National Forests Forest Plan
- Idaho Bird Conservation Plan
- The 2001 amended Biological Opinion (BO) for listed T&E species
- Available conservation assessments and strategies for wildlife
- Best available science

The species evaluated for analysis include at-risk species (TES), MIS, and others identified through the scoping process. Some of these species either do not occur in the project area or their habitat would not be affected by the proposed actions and the level of detail provided in this analysis varies by species.

All stands within the project area were recently surveyed and information on site specific vegetative conditions were updated in the Timber Stand Management Reporting System (TSMRS). This data, including information on species composition, stand structure and history was used to assess wildlife habitat conditions described in this report. The Twin Skin HFRA Project was developed to reduce fuel loading within the county-defined WUI, while also restoring or maintaining fire-adapted ecosystems on National Forest System lands within the project area. The project would reduce the risk of significant threat to human life or property as a result of a wildfire. District and TEAMS wildlife biologists, have made numerous field visits to the project area and vicinity, including multiple visits to proposed units (see survey notes in project file). In addition, Forest Service personnel have been in the project area during every season of the year and

collectively this site specific information was used to assess potential impacts to species with viability concerns, as well as evaluate effects of management actions on Forest MIS species.

Timeframes for direct and indirect effects considered in the analysis include short-term effects, which generally go out 10 years and long term effects, which are greater than 10 years and may go out several decades.

Cumulative effects related to wildlife are evaluated by looking at past, present and foreseeable actions, which are most likely to affect wildlife or result in a change in wildlife habitat conditions and wildlife distribution and use, when considered cumulatively over time. Appendix D of the Twin Skin EA provides a summary of past and foreseeable future actions that have occurred within the project area and includes future activities listed on the Forest's Schedule of Proposed Actions (SOPA), and reasonably foreseeable actions on non-federal lands. Although due to the uncertainty of management actions and lack of detailed habitat data on these non-federal ownerships, when assessing risks to viability, the USFS assumes no contribution of suitable habitat for sensitive species/MIS from adjacent property.

When considering the effects to wildlife over time, and based on past and anticipated future disturbances, the primary factors of change affecting wildlife and wildlife habitat in the Twin Skin project area include; wildfire, timber harvest, forest succession, fire suppression, private land development and recreational use. Specific cumulative effects to wildlife evaluated in this report include an assessment of past, present and future activities on private and National Forest System (NFS) lands and an evaluation of changes in wildlife habitat that have occurred during the cumulative effects analysis period (described below).

Unless otherwise mentioned, the geographic scope or cumulative effects (CE) analysis boundary used to evaluate effects to the wildlife resource includes all private (1493 acres) and National Forest System lands (3132 acres) within the Twin Skin Project Area. This cumulative effects area totals 4625 acres and the following rationale was used to identify the CE analysis area for wildlife.

- A GIS analysis of 6th order watersheds was completed and results indicate that the Twin Skin project area is characteristic of the surrounding landscape, in that the area is over 95% forested and the mix of habitats and structural classes is representative of those found on the landscape.

- Expanding the project area to the north and west would pick up large acreages of upper elevation habitat that is generally less intensively managed. While this would include large areas of more remote wildlife habitat, because these lands are generally less intensively managed, the affect of adding these lands would be a "dilution" of the overall cumulative effects.

- Expanding the area to the south of the project area would pick up private lands that have more residential development, a State highway corridor and increased levels of human activity. As a result, wildlife habitat and use on these lands is quite different from those in the project area.

Although historic effects are considered, the analysis period spans approximately 45 years and runs from @ 1970, which is the period of time when recent timber harvest began within the project area, to 2018, which is the time when all of the proposed treatments are expected to be completed. Some long-term changes in wildlife habitat that go out several decades were also considered.

Project Design Features and Monitoring

Project design features and associated monitoring are described on pages 63 to 71 of this report. These include activities that occur during implementation that are designed to mitigate or reduce impacts to wildlife or wildlife habitat. This section also identifies the estimated effectiveness of these mitigation measures, which is based on monitoring of design features implemented on past activities, similar to those proposed under Alternative 2. Many of the anticipated effects described in the environmental consequences section of this document, are based on implementation of these project design features.

Wildlife Species Not Analyzed in Detail

In order to determine the scope of analysis, a preliminary evaluation was conducted for each potentially affected wildlife species and their habitat. The species listed in Table 1 would not likely be affected by proposed activities because they do not have suitable habitat, are not regularly present, and/or because potentially suitable habitat is adequately protected. For these reasons, these species were not analyzed in detail. Appendix A contains more detailed species specific information considered in the preliminary assessment.

Table 1. Wildlife species not analyzed in detail

Species	Rationale for Elimination from Detailed Analysis	Preferred Habitat
Threatened and Endangered Species		
Woodland Caribou (E) (*Rangifer tarandus caribou*)	No caribou documented within or near the project area; the project area is outside recognized caribou habitat.	Above 4,000 feet in Englemann spruce/subalpine fir and western red cedar/western hemlock forests.
Canada Lynx (T) (*Lynx Canadensis*)	No confirmed sightings; the project lies outside established Lynx Analysis Units.	Higher elevation lodgepole pine and spruce/fir forests with adequate prey base of snowshoe hares, its primary food.
Sensitive Species		
Bald Eagle (delisted from threatened status in August 2007, USDI 2007) (*Haliaeetus leucocephalus*)	No known nests or winter roosts within the project area. Treatment sites occur upland away from water courses and no impacts to this species or its habitat anticipated.	Normally nest and forage near large bodies of water; winter visitors and yearlong residents of northern Idaho.
American Peregrine Falcon *(Falco peregrinus anatum)*	No suitable habitat exists in the project area for this species.	Open habitats near cliffs and mountains; nesting cliffs near an adequate prey base.

Species	Rationale for Elimination from Detailed Analysis	Preferred Habitat
Common Loon *(Gavia immmer)*	No suitable habitat exists in the project area for this species.	Large, clear lakes below 5,000 feet elevation with at least a partially forested shoreline.
Harlequin Duck *(Histrionicus histrionicus)*	Suitable habitat adequately buffered with no impacts to suitable nesting habitat, streamflows or riparian vegetative diversity.	Shallow, swift streams in forested areas.
Black Swift *(Cypseloides niger)*	Suitable habitat buffered with no impacts to suitable nesting habitat, streamflows or riparian vegetative diversity.	Builds nest behind or next to waterfalls and wet cliffs.
Townsend's Big-eared Bat *(Plecotus townsendii)*	No suitable habitat (e.g., roosting, maternity, hibernation) is present within the project area for this species.	Primary roost habitat consists of caves, mines, and abandoned buildings; foraging over wet meadows and other areas of water.
Wolverine *(Gulo gulo)*	No suitable denning habitat. No decrease in prey densities or increased access to remote areas.	Far-ranging omnivorous habitat generalist; isolation from human impacts and a diverse prey base seem to be the most important habitat components.
Northern Bog Lemming *(Synaptomys borealis)*	No suitable habitat exists in the project area for this species.	Wet meadows containing standing water and extensive coverage of sedges and species such as sphagnum moss.
Coeur d'Alene Salamander *(Plethodon vandykei idahoensis)*	Limited suitable habitat exists in the project area; Best Management Practices (BMPs) and Inland Native Fish Strategy (INFS) are in place to protect suitable habitat.	Springs, seeps, spray zones of waterfalls, stream edges and fractured rock.
Management Indicator Species		
Marten (*Martes americana*)	Suitable habitat currently not available; dispersal habitat with no primary core habitat.	Variable mature confer stands with canopy closures greater than 40 percent with abundant large, down woody debris.

Wildlife Species Analyzed in Detail

Table 2 summarizes wildlife species analyzed in detail, the rationale for analysis, and a brief description of their habitats. Direct, indirect and cumulative effects to these species are assessed in this report.

Table 2. Wildlife species analyzed in detail

Species	Threatened (T), Endangered (E) Sensitive (S) or Management Indicator Species (MIS)	Rationale for Detailed Analysis	Preferred Habitat
Northern Gray Wolf (*Canis lupus*)	E	Recent documentation near the project area.	Wide variety of habitats that are generally remote and isolated from human development. Adequate populations of prey species, often wintering concentrations of deer or elk
Grizzly Bear (*Ursus arctos horribilis*)	T	Project area includes BMU with seasonal use.	Habitat generalist. Denning areas isolated and remote from human development.
Flammulated Owl (*Otus flammeolus*)	S	Suitable habitat is present and potentially affected.	Mature, old growth ponderosa pine, Douglas-fir forest.
Pygmy Nuthatch (*Sitta pygmaea*)	S	Suitable habitat is present and potentially affected. Treated as a guild with flammulated owl.	Ponderosa pine habitat, especially mature to old growth stands.
Fringed Myotis *(Myotis thysanodes*	S	Suitable habitat is present and potentially affected. Treated as a guild with flammulated owl.	Caves, mines, and abandoned buildings, large snag habitat.
Black-backed Woodpecker *(Picoides arcticus)*	S	Suitable habitat for this species is present and potentially affected.	Mature conifer stands with numerous snags; post-fire habitat producing an abundance of snags
Fisher *Martes pennanti*	S	Suitable denning and foraging habitat potentially affected	Mature to old growth forest with relatively closed canopies.
Western Toad (*Bufo boreas*)	S	Limited potential breeding habitat. Individuals could be adversely affected.	Adults occur in a variety of uplands; breed in shallow ponds, lakes, or slow moving streams.
Northern Goshawk *(Accipiter gentilis)*	MIS	Suitable habitat is present and potentially affected; past nesting activity.	Mature to old growth forest with relatively closed canopies.
Pileated Woodpecker (*Dryocopus pileatus*)	MIS	Suitable habitat is present and potentially affected.	Forests with tall, large-diameter dead or defective trees for nesting.

Species	Threatened (T), Endangered (E) Sensitive (S) or Management Indicator Species (MIS)	Rationale for Detailed Analysis	Preferred Habitat
White-tailed Deer Winter Range (*Odocoileus virginianus*)	MIS	Suitable habitat is present and potentially affected.	Mosaic of habitat types that provide open parks for foraging and forested areas for thermal and security cover.
Forest Land Birds (including migratory birds)	N/A	Suitable habitat for a variety of land bird species exists within the project area.	Mosaic of habitat types.

Project Area Description

Approximately 98% of National Forest System Lands (NFS) within the project area are forested and of this, 76% consist of sawtimber sized trees including 2% that presently have a stand structure characteristic of old growth. The project area includes approximately 14 miles of stream including the Moyie River along the western boundary, Skin Creek along the south and east boundaries and Deer Creek along the northern boundary of the project area. Lands within 100 meters of a stream, which would include all riparian habitat occur on approximately 9% of the area. Also there are approximately 100 acres of National Wetland Inventory (NWI) wetlands scattered across the project area, most of which are along the Moyie River, Skin Creek or on low-elevation private land. Greater than 80% of the project area is mid to low elevation habitat and only approximately 9% of the project area occurs above 3500 ft., all of which is on Solomon Mountain in the eastern third of the project area. Conversely, all the low elevation habitat (<2500 ft) is associated with the Moyie River and lower Skin and Deer creek, in the western half of the project area, with mid-elevation (2500-3500 ft) habitat between these two areas. Over 75% of the project area is on slopes <40% and largely due to the proximity of private land in and around the project area, motorized access is good. The project area has a total road density of 7.6 mi/mi^2 and an open road density of > 4 mi/mi^2. As a result there is very little remote habitat and presently <15% of the project area is greater than ¼ mile from an open road.

Historically within the project area, periodic wildfires maintained open stands of ponderosa pine, western larch, Douglas fir and white pine. However due to decades of fire suppression, much of the project area is now characterized by dense stands of Douglas fir and grand fir, which have resulted in increased levels of insect and disease related tree mortality, increased fuel loading in many stands and resulted in a departure from historic vegetation. Much of the lands in and around the project area are private and this area is considered a Wildland Urban Interface (WUI). The crowded nature and increased levels of dead wood that predominates in many of these stands has created a hazard for intense fires within the WUI.

Proposed Action (Alternative 2)

The Twin Skin HFRA project proposes treatments on approximately 713 acres of vegetation on National Forest System (NFS) land within the project area. Objectives of the project are to; 1) reduce hazardous fuels, thereby improving our ability to suppress wildfires within a WUI and 2) restore vegetation within the project area towards conditions that would be less susceptible to catastrophic fire, while maintaining and restoring habitat for fish and wildlife species. Road management activities include 14 miles of road reconstruction and maintenance on existing roads and up to 1.5 miles of temporary road may be needed to access timber. The temporary roads would be obliterated by the contractor following use. The obliteration would remove the road segments, and the landscape would be re-vegetated and covered with slash to prevent off-road vehicle use. There is no new permanent road construction proposed. A comprehensive list of treatments included in the proposed action is displayed in Table 3.

Table 3. Treatment Summary

Treatment Type	Acres / Miles
Even-aged Regeneration Cuts	
Irregular Shelterwood (ISW)	34
Shelterwood (SW)	17
Total Regeneration Cuts	**51**
Even and Uneven-aged Partial Cuts	
Commercial Thin/Sanitation Salvage (CT/SS)	273
Group Selection/Commercial Thin (GS/CT)	80
Weed Release/Improvement Cut (WR/IC)	100
Pre-commercial Thinning (PRC)	22
Free Selection (FS)(Uneven-aged)	187
Total Partial Cuts	**662**
Total Acres Treated	**713**
Fuels Treatment	
Grapple Pile	394
Grapple Pile/Underburn	198
Underburn	98
Total Acres of Fuels Treated	**690**
Logging System	
Ground-based	412
Skyline	278
Transportation Treatments	
Road Reconstruction & Maintenance	14 mi.
Temporary Road Construction	1.5 mi.

Timing and Duration of Activity - The activity will be under a five-year timber sale contract beginning in 2008. Prescribed burning would be implemented within one to two years following harvest.

Alternative 1 (No Action)

Alternative 1 – Under this alternative no new federal actions would be implemented. Alternative 1 will let ecological processes control vegetation development and habitat changes will occur primarily from natural disturbances, although on-going activities such as recreation, wildfire suppression, previously identified noxious weed control, and firewood collection would continue. This is a viable alternative and provides a baseline or reference point, from which effects of the action alternative (Alternative 2) can be evaluated.

Affected Environment and Environmental Consequences

This section describes the status and distribution of wildlife species analyzed in detail that could be affected by alternatives considered. It also describes the environmental baseline and relevant habitat components that may or may not be affected by the alternatives. Information presented here is based on scientific literature, wildlife databases, professional judgment, recent field surveys, and habitat evaluations.
The following definitions of capable and suitable habitat will help the reader distinguish between these important concepts used throughout this report.

Capable Habitat - Refers to the inherent potential of a site to produce essential habitat requirements of a species. The vegetative structure and composition on the site may not currently provide the necessary attributes (e.g., stand age, cover type, or stand density) to support a species, but the site has the fixed attributes that would enable it to provide those variables under appropriate conditions. Some examples of fixed attributes are slope, aspect, soil, or elevation.

Suitable Habitat - Refers to wildlife habitat that currently has both the fixed and variable stand attributes for a given species' habitat requirements. Variable attributes change over time and may include stand age, cover type, stand density, tree size, or canopy cover.
This section also describes the potential impacts associated with implementation of each of the alternatives considered. No site specific public concerns for wildlife and wildlife habitat were identified during the scoping process, which included a collaborative field trip with interested parties. However general wildlife related issues include:

- There is concern that the proposed action will result in impacts to wildlife, including MIS and T&E species and that adequate analysis needs to be completed to assess impacts.

- There is concern harvesting operations would remove valuable snags, reducing habitat important to snag-dependent species; and reducing future down woody material important to some species and soil development.

In addition, Table 4 lists the issue indicators that have been identified to measure potential impacts of alternatives on relevant wildlife species. Habitat associations provide the foundation for assessing habitat suitability and predicting effects. Specific vegetation data was assembled and evaluated to determine its application to key habitat components that define suitable conditions. The project file has an interpretation of key components for determining habitat suitability.

Table 4. Issue indicators used to measure effects

Species	Indicator
Fisher	Changes to suitable denning habitat
Flammulated Owl	Changes in late forest structure, canopy closure, and large snag habitat
Pygmy Nuthatch	Same as flammulated owl
Black-backed Woodpecker	Changes in quality, abundance, and distribution of snag habitat
Fringed Myotis	Same as flammulated owl
Western Toad	Changes in breeding and upland dispersal habitat
Pileated Woodpecker	Changes in quality and abundance of large diameter trees and snags
Northern Goshawk	Changes in habitat suitability, late forest structure and nest production
White-tailed Deer	Changes to critical winter range and forage availability
Forest Land Birds	Changes in forest health, stand structure, and habitat diversity

The desired future condition (DFC) for the project area includes reducing surface fuels to create a condition that lessens surface fire intensity from what is currently expected. Ladder fuel removal would reduce the ability of fire to move into the tree crowns. In the future these stands would have increased crown spacing to reduce the ability of fire to spread between crowns, should fire come into the stands. The DFC would provide improved safety for homeowners and firefighters by allowing for direct attack and a higher probability of success during fire suppression actions.

Historically, mixed severity fires broke up the fuels and created diverse structure that was less likely to support large wildfires and as a result, the project area was more resistant to intense large-scale wildfires. It is estimated that much of this area was burned by mixed severity wildfire in the 1920's and 1930s. Decades of fire suppression have subsequently resulted in a more continuous forest canopy with large amounts of fuels in the understory and this current condition is more prone to intense wildfire.

Fire suppression, fir engraver in grand fir, mountain pine beetle in lodgepole pine, and blister rust in white pine; have affected forest species composition and subsequent wildlife habitat. Some of the project area is crowded with immature to medium-sized trees. Fire suppression on drier sites has favored shade-tolerant species, primarily Douglas-fir and grand fir, which have formed dense, homogeneous understories that have displaced the ponderosa pine. On the moister sites, blister rust has caused Douglas-fir and grand fir to replace historically dominant western white pine and western larch. These changes in forest composition have led to higher incidences of insect and disease (root rot and heart rot) and higher levels of tree mortality.

Increased tree mortality has increased the number of snags and down logs. However many of the standing dead trees are small diameter (less than 20 inches dbh), which don't provide habitat for many snag dependent species. In addition, the disease agents weaken the roots and tree trunks of snags making them susceptible to windthrow. White pine blister rust is affecting large-diameter white pine, whereas root diseases affect larger Douglas-fir and grand fir. While these larger snags provide some short-term wildlife value, the overall effect has been a decline in the number of live, large-diameter trees (greater than 20 inches dbh), a change in species composition, and a loss of habitat diversity.

Federally Threatened and Endangered Wildlife Species

Based on the known distribution of these species, their habitat requirements, and availability, only the gray wolf and grizzly bear may be impacted by the proposed action and only these species will be discussed in detail in this assessment.

Gray Wolf

Existing Condition

The northern Rocky Mountain wolf (a subspecies of the gray wolf) was listed as endangered in 1973. However, based on enforcement problems and a trend to recognize fewer subspecies of wolves, the full species was listed as endangered throughout the entire lower 48 states, except Minnesota, in 1978 (USDI 1987). In the past, substantial declines in numbers of wolves resulted from control efforts to reduce livestock and big game depredations. By the 1940's, the Rocky Mountain wolf was essentially eradicated from its range. In 1994, final rules in the Federal Register made a distinction between Idaho wolves that occur north of Interstate 90 and wolves that occur south of Interstate 90. Gray wolves occurring north of Interstate 90 are listed as endangered species and receive full protection in accordance with provisions of the Endangered Species Act.

Wolves are highly social animals requiring large areas to roam and feed. Conservation requirements of wolf populations are not fully understood, but the availability of prey and limiting the risk of human-caused mortality are considered important components (USDI 1987). The Fish and Wildlife Service identified key wolf habitats as those with: 1) a sufficient, year-round base of big game, 2) suitable and somewhat secluded denning and rendezvous sites, and 3) sufficient space with minimal exposure to humans. Wolves generally den on southerly aspects of moderately steep slopes in well-drained soils (or rock caves/abandoned beaver lodges), usually within 400 yards of surface water and at an elevation overlooking surrounding low-lying areas. Rendezvous sites are characterized by complexes of meadows and adjacent hillside timber, with surface water nearby (USDI 1987).

The Twin Skin HFRA project occurs north of Interstate 90. Gray wolves occurring in Idaho north of Interstate 90 are listed as endangered and receive full protection in accordance with provisions of the Endangered Species Act. The project area lies within the Northwest Montana Wolf Recovery Area. During the 2007 field season, a female wolf recently denned approximately ½ mile east of the project area on a ridge above

Solomon Lake. This female is believed to be part of a group that has been documented on the Kootenai NF in the Meadow Creek area, approximately seven miles east of the project area. To date, a den location and reproduction of this un-named group has not yet been confirmed, although efforts are on-going to better document use of the area by this group (personal communication between Brett, Lyndaker, Wayne Kasworm and Wayne Wakkinen 2007). In addition to the Meadow Creek group, there is an established pack in Boulder Creek, 10 miles south of the project area.

Due to the amount and distribution of private land in and around the project area, its proximity to Moyie Springs and recreational use in the area and the relatively high road density (7.6 miles/mi^2), the area receives considerable human use. Also over 50% of existing roads are open to year round use and >80% of the project area is within ¼ mile of an open road. Collectively, the interspersion of private land and residences, total road density, and large number of open roads, would make the area less preferred as den or security habitat. However the area supports populations of moose, elk and white-tail deer as potential prey items and it is likely that portion of the project area lies within the home range of the Meadow Creek group.

Environmental Consequences

Methodology

Potential effects to the gray wolf were evaluated by assessing the potential for harm or harassment and by looking at impacts to denning sites, rendezvous sites, security habitat and hiding cover. Because the most important criteria for wolf management is the maintenance of an abundant prey base and minimizing the risk of illegal mortality, changes in access and big game were also evaluated.

Analysis Area

A GIS analysis of 6th order watersheds was completed and results indicate that the Twin Skin project area is characteristic of the surrounding landscape, in that the area is over 95% forested and the mix of habitats and structural classes is representative of those found on the landscape. As a result effects to the gray wolf will be evaluated by looking at all past, present and foreseeable future actions on federal and non-federal lands within the project area boundary. Although historic effects are considered, the cumulative effects analysis period spans approximately 45 years and runs from @ 1970, which is the period of time when recent timber harvest began within the project area, to 2018, which is the time when all of the proposed treatments are expected to be completed. Some long-term changes in wildlife habitat that go out several decades were also considered.

Alternative 1

Direct and Indirect Effects - Because there are no activities proposed, there will be no direct effects to the gray wolf under this alternative. However in the absence of mechanical treatments, wolf habitat conditions would change. There would be a continued shift toward more shade tolerant species, and small diameter trees and understory congestion would continue to build up in most stands. Insects, disease and competition for sunlight and nutrients would hasten tree mortality and trigger increases in

down woody material. As a result cover conditions would be improved. Conversely, the closed canopy conditions that will be resulting under this alternative will decrease available herbaceous and woody vegetation in the understory and it is anticipated that this alternative would result in a reduction in big game forage, resulting in localized reductions in big game and a subsequent reduction in the wolf prey base.

The scenario described above assumes that there would be no stand-replacing fire in this area. Given the history of active fire suppression, existing high fuel loads in many stands and increased fuel concentration resulting from the absence of management, it is reasonable to assume that the area will be affected by wildfire at some point in the future. The magnitude of this fire would depend upon area accessibility, available suppression resources, weather and other environmental factors. A mixed-severity fire would not likely alter large portions of available habitat, but a large stand-replacing fire would reduce the availability of suitable cover for several decades.

Current activities such as firewood collection, road maintenance, dispersed recreation, collection of special forest products (e.g Christmas trees & wreaths) and noxious weed treatment along road corridors will continue to occur. However much of this will be concentrated along open roads, many of which already have year-long access. As a result, the level of disturbance is not expected to increase and potential disturbance to wolves would be minor. Also none of these activities would adversely affect more remote habitat away from roads. It is also anticipated that there would be occasional wildfire suppression and because this may occur in more remote portions of the project area, this activity could be a source of short-term disturbance to wolves.

Cumulative Effects - Based on past disturbances within the CE area, the primary factors of change affecting gray wolf habitat include road construction, timber harvest, changes in access and land use changes. Although approximately 30% of the project area is in non-federal ownership, only approximately 10% of the area is in non-forest habitat associated with residences or small scale livestock production. There has been some residential development in the last 3-5 years within the project area and some additional development is expected in the future. Current levels of human activity in these areas are also expected to continue, although due to the proximity to year-round open roads, potential impacts to wolves would be minor.

Past timber harvest was assessed using TSMRS records, aerial photographs and some ground truthing and it is estimated that timber harvest treatments were implemented on approximately 50% of the project area during the analysis period (1970-2018). Of this, it is estimated that approximately 22% of the project area has been regenerated and consists of young (seedling/sapling/pole) third growth forest. As described previously, due to the level of past roading and proximity to private land and associated human disturbance, there is very little remote habitat within the project area. Because there is already access to much of the private land within the analysis area, there is no additional new road construction anticipated on non-federal lands and there are no anticipated reductions in remote habitat.

While there will be some increase in forage on private lands due to future timber harvest, because this alternative does not propose any activities that will maintain past and present levels of big game forage on NFS lands, it is anticipated that available big game forage will be reduced under this alternative within the next 10 years. If there are no natural disturbances that increase light to the forest floor, over the long-term there will be a reduction in herbaceous and woody vegetation. As a result implementation of Alternative 1 will reduce available big game forage, possibly resulting in localized decreases in big game and a reduction in the wolf prey base.

Potential hazards from wildfire are high under this alternative and without management intervention forested conditions within the project area would continue to deteriorate. High fuel accumulations resulting from fallen trees would lead to greater hazards if a stand-replacing wildfire occurs. Also if a stand-replacing fire were to occurs, it would take at least 75 years for successional processes to restore habitat to its present condition.

Effects Determination for Alternative 1

Although there will be some increases in available cover, because implementation of this alternative will result in decreased forage for big game, increased hazards associated with future wildfire and possible long-term loss of habitat, implementation of this alternative, **may affect, but is not likely to adversely affect** the gray wolf or its habitat.

Alternative 2

Direct and Indirect Effects - Project activities with the potential to affect the gray wolf or its habitat include timber harvest, road re-construction/maintenance on existing roads, temporary road construction and proposed burning identified in Table 3. Additionally in the event that incidental residual tree mortality occurs as a result of windstorms, ice damage, fire or insects and disease, some salvage harvest may occur in the treatment units and associated roadsides. There may also be some collection of special products from pre-commercial thinning sites. Although disturbance to wolves could result from the above activities, implementation at any site will occur within 2 years and effects will be short term in nature. Additionally, considering that there will be no increase in permanent open roads and temporary roads will be obliterated following use, there will be no increases in road related mortality or conflicts with humans.. Also because there will be no change in public access, there are no long-term direct impacts or loss of existing security habitat anticipated.

Timber harvest and associated fuels treatments may represent a persistent source of disturbance to gray wolves and their prey. Although up to 23% of the project area will be affected by commercial or non-commercial timber harvest, this localized disturbance would only occur for one to two years at a given site. Also almost 70% of proposed treatments occur within ¼ mile of open roads and some level of disturbance is already occurring at these sites. Currently, it is unclear to what extent the Meadow Creek group is using the Twin Skin project area. While there is a possibility that this group could be disturbed at den or rendezvous sites by project activities, because of the open road density and high amount of human use in the area, it is unlikely that most of the project area would be utilized for anything other than foraging or transitory use. However in

order to reduce the risk of disturbance and minimize impacts, the following conservation recommendations will be implemented:

- *Any gray wolf den or rendezvous sites identified in or adjacent to proposed activity areas will be spatially and/or temporally buffered as appropriate. This would include:*
    - *No project activities within one (1) mile of occupied sites from April 1-July 1 for den sites and from July 1-August 15 for rendezvous sites. Upon review by the Forest Level 1 team, these distances could decrease based on topographical characteristics at each site.*

- *Due to their proximity to recent wolf sightings, all timber harvest in the Solomon Lake Units (Units 16-18) will be restricted from April 1 through August 15.*

It is assumed that as additional information becomes available, appropriate conservation requirements will be updated and applied as necessary.

Indirect effects include any activity that may result in habitat changes for the gray wolf and vary depending on the type of treatment. Approximately 21% and 2% of the NFS lands within the project area will receive a partial harvest and regeneration timber harvest treatment respectively (See Table 3), whereas burning and fuels treatments will occur on all sites receiving harvest, or approximately 23% of the NFS lands within the project area. Although there would be a loss of hiding cover, particularly in regenerated areas, over 90% of the treatments involve partial harvest activities. Because these treatments maintain a sawtimber overstory on the treated site they will continue to offer some degree of hiding cover. Also following treatment, lands containing predominately sawtimber sized trees will continue to exist on almost 70% of the project area and suitable cover conditions will continue to predominate and be well distributed across the project area.

Although there would be a loss of hiding cover, particularly in regenerated areas (51 acres), and some behavioral avoidance by both wolves and big game during implementation, because treatments at any site will be completed within one to two seasons, it is anticipated that animals will re-occupy the area shortly after treatment and any adverse effects will be short-term in nature. Long-term effects of timber harvest and prescribed burning would be an increase in the quality and quantity of big game forage on sites treated. As a result, it is anticipated that changes in habitat resulting from this project would likely create a net benefit to big game species, and consequently to wolves. This increased availability of big game habitat is consistent with Forest-wide direction, which calls for maintaining high number of prey species in areas of reported wolf occurrence (USDA-FS 1987).

While logging will reduce cover and structure on treatment sites, over the long term, treatment would encourage growth of large diameter larch, white pine and Douglas-fir and this increase in stand diameter, as well as improved stand structure, will improve habitat for the gray wolf and its prey. Proposed timber harvest would also make measurable reductions in fuel loading and reduce the possibility for stand-replacing fire, which could result in a long-term loss of cover for the gray wolf.

Cumulative Effects – Since there is no new permanent road construction proposed or changes in road management on NFS lands, the primary factors affecting the gray wolf and its habitat include timber harvest and prescribed burning. As described under Alternative 1, past timber harvest treatments have been implemented on approximately 50% of the project area. Also the pattern of past cutting on non-federal lands is expected to continue. With implementation of Alternative 2, cumulatively during the analysis period it is estimated that approximately 70% of the project area received some form of timber harvest. Although approximately 67% of this included partial harvest treatments that maintained sawtimber sized trees and 50% canopy closure or more on the site, whereas approximately 22% of the area would have been affected by some form of regeneration harvest. Cumulative burning will total 23% of the analysis area and will occur on the same sites as those proposed for future timber harvest.

Other than treatments proposed under Alternative 2, there is no additional scheduled timber harvest anticipated. Although current activities such as firewood collection, dispersed recreation and occasional noxious weed treatment along road corridors will continue. While these activities may be a short-term (1 year), localized source of disturbance to wolves, much of this will be concentrated along open roads and the level of disturbance is not anticipated to increase.

Based on the above analysis, approximately 67% of the project area will be characterized by forested stands that contain predominately sawtimber sized trees that will continue to provide cover conditions for both the gray wolf and big game. Also because there will be no increase in permanent roads or changes in road management, existing security habitat will remain intact under this alternative. Treatments proposed under this alternative will continue to provide adequate levels of forage and cover to maintain big game populations within the project area and there is no anticipated change in the wolf prey base.

Effects Determination for Alternative 2

The most important criteria for wolf management are the maintenance of an abundant prey base and minimizing the risk of illegal mortality. As a result, virtually any area that has sufficient prey and adequate protection from human-caused mortality could be considered potential gray wolf habitat (USDI 2003). With implementation of the above conservation recommendations to protect potential den and rendezvous sites and reduce disturbance related impacts in the Solomon mountain area, and considering there will be no new permanent open roads and existing security habitat will be retained, it is unlikely that the Twin Skin project will increase the vulnerability of wolves or adversely influence their ability to use the area. Further, the increased prey availability that will result due to implementation of the project will maintain or improve foraging habitat across the project area. For these reasons and considering the ability of the gray wolf to occupy a wide range of habitats and thrive under a variety of land uses (USDI 2003), the Twin Skin project **may affect, but is not likely to adversely affect** gray wolf or their habitat.

Consistency with Forest Plan and Other Regulations

All alternatives are consistent with Forest Plan direction to manage the habitat of species listed under the Endangered Species Act (USDA Forest Service 1987 p. II-6). Alternatives are also consistent with recovery recommendations related to minimizing human access and wolf mortality, maintaining a sufficient, year-round big game forage base and protection of suitable den and rendezvous sites (USDI 1987).

Grizzly Bear

Existing Condition

The grizzly bear was listed as Threatened in 1975. It was originally distributed in various habitats throughout western North America. Today, it is confined to less than two percent of its original range and represented in five or six population centers south of Canada, including the Cabinet-Yaak and Selkirk Ecosystems that are located in northeastern Washington, northern Idaho and northwestern Montana. Habitat loss and direct and indirect human-caused mortality are related to its decline (USDI 1993).

The U.S. portion of the Selkirk and Cabinet-Yaak Ecosystems is divided into grizzly bear management units (BMUs) ranging in size from ~30-160 square miles. The Idaho Panhandle, Kootenai and Colville National Forests, and the Idaho Department of Lands administer these BMUs. BMUs are designed to approximate the average home range of a female grizzly bear (~100 mi^2), facilitate documentation of bear numbers and distribution, and track cumulative effects within the ecosystem (Christensen and Madel 1982).

The Grizzly Bear Recovery Plan (USDI 1993) indicates that the most important element in grizzly bear recovery is reducing mortality risk. This is a reflection of an area's ability to support grizzly bears based on the quality of the habitat and the type/amount of human disturbance imposed on the area. Controlling and directing motorized access is one of the most important tools in achieving habitat effectiveness and managing grizzly bear recovery (USDI 1993). By controlling motorized access, certain objectives can be achieved including minimizing human interactions and potential grizzly bear mortality, reducing displacement from important habitats, and minimizing habituation to humans. This strategy involves achieving specified levels of "core" habitat (areas >500 m from drivable motorized routes) and road densities.

The Twin Skin project area encompasses approximately 4600 acres, of which approximately 600 acres in the northeast portion of the project area are located within the Keno BMU. The Keno BMU is in the Cabinet-Yaak Recovery Zone and is approximately 51,236 acres in size, including 21,000 acres on the IPNF. Conservation recommendations identified in the 2001 Amended Biological Opinion for the Continued Implementation of the IPNF Land and Resource Management Plan (USDI-FWS 2001) include maintaining established levels of core habitat, Total Motorized Route Density >2 mi/mi^2 (TMRD) and Open Motorized Route Density >1 mi/mi^2 (OMRD). Table 5 displays the current standard and existing condition related to these recommendations for the Keno BMU.

Table 5. Keno BMU existing condition and proposed standards.

	% Core Habitat[1]	% OMRD[2]	% TMRD[3]
Existing (2007) condition	59	34	24
2001 BO Standard	55	33	26

[1]Percent of BMU >500 m from drivable motorized routes.
[2]Open Motorized Route Density >1 mile/square mile (percent of BMU)
[3]Total Motorized Route Density >2 miles/square mile (percent of BMU)

Although the Keno BMU presently exceeds the standards for core habitat and TMRD, it currently does not meet the OMRD standard established in the 2001 Biological Opinion. Total and open road densities for both the project area and that portion of the BMU within the project area are three to four times higher than the recommended standard and only 69 acres of core habitat currently exist within the project area. Considering the level of roading that presently occurs and the associated human activity, use of the project area by bears is expected to be low with only periodic sightings or sign of grizzly bear activity. The nearest recent observation was a young male that was trapped in 2003 at the Deer Creek refuse site, immediately adjacent to the southeast corner of the project area.

Because much of the Twin Skin project area occurs at lower elevations below 3000 feet, it typically receives less snowfall. As a result, these low elevation southerly and easterly aspect slopes green-up early in the year and these areas can provide abundant spring forage for grizzly bear. However potential forage species dry out and lose palatability fairly early in the season. Also due largely to the suppression of wildfires, much of the project area consists of mesic habitats that generally contain a dense canopy layer of small diameter (<8” dbh) trees, that reduce the amount of herbaceous vegetation in the understory. These features, in combination with the fact that treatment areas are geographically situated between spring habitat and high elevation summer habitat, suggest that the greatest potential for grizzly bear use within the Twin Skin project area occurs in the spring. The larger total and open road density, as well as increased levels of human activity that characterizes much the project area, would reduce the suitability as grizzly bear habitat. For these reasons, the area would be considered primarily spring habitat for grizzly bears and any use in the area would be expected to be short-term and transitory in nature.

Environmental Consequences

Methodology

The analysis of effects on grizzly bears focuses on impacts to core habitat and changes in road densities within the Keno Bear Management Unit (BMU). Grizzly bear core habitat consists of areas that are outside of a 0.31 mile (500 m) influence zone of both open and restricted roads, railroads, and motorized trails. Open motorized route density (OMRD) and total motorized route density (TMRD) are calculated using the moving windows

analysis described in Wakkinen & Kasworm (1997). OMRD calculations take into account open roads, railroads, motorized trails, and any restricted road segments where the number of administrative trips exceeds allowable limits for any given season during the "bear year" (non-denning period). TMRD calculations take in these same routes, as well as roads restricted by gates or guardrail barriers for the duration of the non-denning period. Roads closed by earthen barriers or roads that are physically impassable to motorized vehicles do not figure into road density calculations.

Since the IPNF does not have a vegetation-based grizzly bear habitat suitability model, possible changes to vegetation will be addressed qualitatively. Core habitat is reported as a percent of each BMU. Road densities are reported as the percent of the BMU having an OMRD >1 mile/mile^2 or TMRD >2 miles/mile^2. There is no core habitat requirement for occupied areas outside recovery zones.

Analysis Area

Because the Keno Grizzly Bear Management Unit (BMU) occurs within the recovery zone with specific management direction related to maintaining suitable habitat conditions within this area, the analysis of effects on grizzly bears focuses on possible direct effects, impacts to core habitat and changes in road densities within the Keno Grizzly Bear Management Unit (BMU). However some effects outside the recovery zone are also discussed.

Alternative 1

Direct and Indirect Effects – Under the no action alternative, there would be no increase in direct effects or harm or harassment to grizzly bears. However in the absence of mechanical treatments, habitat conditions would change. There would be a continued shift toward more shade tolerant species, and small diameter trees and understory congestion would continue to build up in most stands. Insects, disease and competition for sunlight and nutrients would hasten tree mortality and trigger increases in down woody material. As a result cover conditions would be improved. Conversely, the closed canopy conditions that will be resulting under this alternative will decrease available herbaceous vegetation and it is anticipated that this alternative would result in a reduction in available spring forage for grizzly bear.

The scenario described above assumes that there would be no stand-replacing fire in this area. Given the history of active fire suppression, existing high fuel loads in many stands and increased fuel concentration resulting from the absence of management, it is reasonable to assume that the area will be affected by wildfire at some point in the future. The magnitude of this fire would depend upon area accessibility, available suppression resources, weather and other environmental factors. A mixed-severity fire would not likely alter large portions of available habitat, but a large stand-replacing fire would reduce the availability cover for several decades. If wildfire occurs there could be a widespread increase in available spring forage and a loss of cover.

Current activities such as firewood collection, road maintenance, dispersed recreation, collection of special forest products (e.g Christmas trees & wreaths) and noxious weed

treatment along road corridors will continue to occur. However much of this will be concentrated along open roads, many of which already have year-long access. As a result, the level of disturbance is not expected to increase and the potential for disturbance to grizzly bear is discountable. Also none of these activities would adversely affect more remote habitat away from roads or existing core habitat. If wildfire occurs there may be suppression efforts in more remote portions of the project area. However because effects will be short-term in nature, potential effects to grizzly bears are discountable.

Alternative 2

Direct and Indirect Effects - Project activities that have the potential to impact grizzly bears include timber harvesting, road re-construction and maintenance activities and prescribed burning activities (See Table 3). Additionally in the event that incidental residual tree mortality occurs as a result of windstorms, ice damage, fire or insects and disease, some salvage harvest may occur in the treatment units and associated roadsides. There may also be some collection of special products from pre-commercial thinning sites. The effects of these activities on grizzly bears can be both short and long term, with short term impacts occurring within the next 5-10 years during implementation, whereas long-term effects include changes in forest structure (reduction of cover and increased foraging habitat) that can last for decades. Since this proposal will not permanently increase motorized route miles, disturbance effects are limited to the short-term impacts of road related activities, timber harvesting and subsequent fuels treatment. The level of potential disturbance is influenced by a number of factors including: 1) the intensity and duration of activity, 2) the correlation of the activity with seasonal habitat preferences of bears, 3) the association of activity with quality habitat, and 4) cumulative impacts from other sources of disturbance.

A total of 199 acres of commercial thinning/sanitation salvage harvest will occur within the Keno BMU (Units 16-18). In order to avoid displacement of bears during the spring season, when bears are most likely to be present, the following design feature will be implemented to minimize potential disturbance to bears within the BMU:

- *In order to minimize disturbance to grizzly bears during project implementation, all timber harvest in units 16-18, will take place outside the spring bear season (April 1 to June 15).*

Indirect effects or changes in habitat conditions that result due to proposed timber harvest will be an opening up of the canopy and development of herbaceous and woody vegetation in the understory. A mature overstory would be retained (@ 50% crown closure) and all sites would continue to provide some cover, as well as increased levels of forage. A total of 53 acres (Units 16 and 17) would be treated with ground based systems, while the remaining 146 (Unit 18) acres would be logged using a mix of tractor (50 acres) and skyline yarding (96 acres). All units are within the 500 m influence zone of drivable roads, outside of core habitat. Because of the importance of minimizing human/bear interaction, the type of treatment and the proximity of treatments to open roads is a consideration. The 2001 BO requires that at least one sight distance be maintained between open roads and regeneration harvest units and that adequate cover be retained

between management created openings. While there is no regeneration harvest proposed within the BMU, treatments will occur along 0.6 miles of open road and proposed treatments will increase visibility and the potential to expose bears using the area. However all harvest involves thinning that will retain cover across the entire site and this prescription would provide limited sight distances and ample forest cover for grizzly bear security.

All sites receiving timber harvest treatment (199 acres) will also have fuels treated with a combination of grapple piling and burning, and underburning. Because this treatment will occur in the spring, it is possible that bears in the area could be disturbed and forced to move out of the area. However treatment at any one site will only occur for one to two years and potential effects will be short term in nature. Also bear use within the project area is in-frequent and considering all treatment areas are within 500 meters of an open road, there is a low probability of grizzly bear presence and displacement within the treatment areas.

Core habitat is an important consideration in managing grizzly bear habitat and is necessary to provide a sanctuary for grizzly bears that is relatively free of human disturbances, in order that bears may meet their life requisites for survival and reproduction. Because all treatments are within 500 meters of an open road, there will be no reduction in core habitat due to proposed treatments.

Within the Keno BMU there are 2.4 miles of road reconstruction proposed and this work, as well as road maintenance and haul may result in disturbance to bears. However all work will occur on existing roads and with implementation of the following mitigation measures, potential disturbance will be minimized:

- *All road re-construction and maintenance activities that take place within the Keno BMU will occur outside the spring bear season (April 1 to June 15).*

- *Roads 2549 UH and 2549UE will be made impassable to public traffic during and after implementation of the Twin Skin project.*

All road re-construction will occur on existing roads. Also because all treatments are within 500 meters of open roads and with implementation of the above mitigation measures to keep roads closed during and after project implementation, there will be no change in open road densities or reduction of core habitat. As a result there will be no change in access and treatments will adhere to standards established in the 2001 Biological Opinion (USDI 2001).

Outside of the BMU, timber harvest, burning and temporary road construction will occur on 514 acres, 492 acres and 1.5 miles respectively. Although disturbance to bears outside of the recovery zone is a possibility, incidental use is infrequent. Also considering 80% of the proposed treatments outside of the BMU occur within 500 meters of open roads, potential for disturbance related effects is remote and discountable. Over 90% of this harvest involves thinning and selection harvest and because treatment will maintain a

sawtimber overstory and increase spring forage (described above), there will be no significant changes in bear habitat outside of the Keno BMU.

While logging will reduce cover and structure on treatment sites, over the long term, treatment would encourage growth of large diameter larch, white pine and Douglas-fir and this will increase stand diameter as well as improve stand structure. These changes in structure, including increased levels of large diameter dead wood and greater understory diversity, would be expected to provide long-term improvement to grizzly bear habitat. Proposed timber harvest would also make measurable reductions in fuel loading both within and outside the BMU and reduce the possibility for stand-replacing fire, which could result in a loss of grizzly bear cover.

Alternatives 1 and 2

Cumulative Effects - Past activities within the Keno BMU that have the potential to adversely affect the grizzly bear include primarily road construction and management. While the short term effects of these activities are not known, long term effects included a reduction in core habitat and an increase in open and total road densities to levels identified in Table 5. Alternative 2 will increase timber harvest and burning by 199 acres and result in up to 2.4 miles of road re-construction and maintenance. Although cover and forage conditions will be affected (as described above), there will be no reduction in core habitat and implementation of Alternative 2 is consistent with the 2001 BO (USDA-FS 2001).

In addition to treatments proposed under Alternative 2, current activities such as firewood collection, dispersed recreation and occasional noxious weed treatment along road corridors will continue under both alternatives and may be a short-term, localized source of disturbance to bears. However these activities will be concentrated along open roads and the level of disturbance is not expected to increase.

Past levels of timber harvest on non-federal lands are expected to continue at current levels and based on harvest that has occurred within that portion of the Keno BMU within the project area and aerial photographs, it is anticipated that that preferred cover and forage conditions will continue to be widely available across the BMU. As discussed above there is currently a high total and open road density and many of the non-federal lands within the BMU are heavily roaded. As a result it is anticipated that future timber harvest on these lands will largely utilize the existing road system. Additionally the USFS would have to manage roads to offset any additional road building on other ownerships and for these reasons and there is little change in core habitat or road densities anticipated.

Determination for Alternative 1

There would be no additional harassment or harm to the grizzly bear, no change in access and little change in security habitat under this alternative. However because the lack of treatment will reduce available spring forage and increase the hazards associated with

severe wildfire, implementation of Alternative 1 **may affect, but is not likely to adversely affect** the grizzly bear or its habitat.

Determination for Alternative 2

While limiting the season and duration of activities within the Keno BMU is expected to reduce the potential for disturbance and/or displacement of grizzly bears, there are no guarantees that bears will not be present and affected during implementation of the Twin Skin project. However based on the analysis presented above and the following rationale, the risk of adverse affects is considered to be extremely remote and considered discountable:

- There will be no changes in access to the project area.
- Implementation of site specific design criteria will reduce the likelihood that a grizzly bear is harassed or harmed as a result of proposed activities. Also any displacement is expected to be short term in nature.
- Due to high total and open road density and level of human activity, use by the grizzly bear is infrequent and seasonal in nature.
- Within the Keno BMU there will be no change in access or loss of core habitat and implementation of Alternative 2 is consistent with standards established in the 2001 Biological Opinion (USDI-FWS 2001).
- There will be no change in security habitat and Alternative 2 is consistent with Forest Plan direction to strive for at least 70% security or established threshold level for each grizzly bear unit (USDA-FS 1987 p. II-27).

As a result, implementation of the Twin Skin project **may affect, but is not likely to adversely affect** the grizzly bear or its habitat.

Consistency with Forest Plan and Other Regulations

All action alternatives are consistent with Forest Plan direction to manage the habitat of species listed under the Endangered Species Act (USDA Forest Service 1987 p. II-6) and to maintain 70% security habitat within each bear unit (USDA Forest Service 1987 p. II-27). Also within the Keno BMU there will be no loss of core habitat and with implementation of project mitigation measures, both alternatives are also consistent with the 2001 Amended BO addressing effects to listed Endangered and Threatened Species from Continued Implementation of the Idaho Panhandle National Forest Land and Resource Management Plan (USDI 2001).

Biological Evaluation—USFS Sensitive Wildlife Species

Flammulated Owl, Pygmy Nuthatch and Fringed Myotis

These species are discussed together because they share similar habitat requirements. The following section describes the existing condition and habitat requirements for each

species independently, whereas the environmental consequences section provides the effects analysis for all three species.

Existing Condition–Flammulated Owl

Flammulated owls are seasonal migrants that occupy home ranges in the northern Rocky Mountains during spring, summer, and early fall. They are strongly associated with ponderosa pine forests during breeding and prefer open, single-storied stand structures for foraging (Hayward and Verner 1994; Reynolds and Linkhart 1992). Areas that are composed of at least 75 percent old ponderosa pine/Douglas-fir forest type are occupied by flammulated owls more than those areas with less than 75 percent of this forest type (Wisdom et al. 2000). Variability in stand structure is also an important component because flammulated owls nest and forage in open stands and tend to roost in fairly dense stands (Wisdom et al. 2000). Flammulated owls prefer mature ponderosa pine and Douglas-fir with low stand densities and moderately open canopies for nesting; however, they sometimes nest in spruce/fir, lodgepole pine, and aspen. Flammulated owls are secondary cavity nesters and favor cavities excavated by pileated woodpeckers and northern flickers. These owls feed primarily on moths and large insects at night.

Based on vegetation estimates, ponderosa pine has suffered an 84 percent decrease from historic conditions (Idaho Partners in Flight 2000) and Noss et al. (1995 *In* IPIF 2000) listed old-growth ponderosa pine forests as endangered (85-95% decline) in the northern Rocky Mountains, Intermountain West, and eastside Cascade Mountains. It is also important to note that the types of dry ponderosa pine forest in Idaho represent a significant component of their worldwide distribution. Objectives for this forest community include restoring as much ponderosa pine forest as possible by 2025, but at a minimum, achieving desired structural conditions on 10% of the historical range (Idaho Partners in Flight 2000). The flammulated owl is considered a high priority bird species in the State if Idaho, due largely to the reduction of ponderosa pine/Douglas fir communities across its range (Idaho Partner in Flight 2000).

Primary factors that contribute to the loss of older ponderosa pine/Douglas-fir forests include fire suppression and intense forest management. Early timber harvests usually targeted the largest trees, which in most instances were ponderosa pine, and to a much lesser extent Douglas-fir and western larch. This form of harvest, coupled with fire suppression, has allowed smaller, shade-tolerant, late-successional species such as Douglas-fir to capture the growing space (Sampson et al. 1994). These dense stands of shade tolerant species are also highly susceptible to drought stress, insect and disease infestations and high intensity fires. The result has been a rapid shift on many sites from open stands of old growth trees to dense stands of young trees and has greatly reduced habitat available to wildlife dependent on this community. When natural fire is not suppressed, drier habitats tend to produce older, single strata ponderosa pine/Douglas-fir communities, which in turn provide the necessary habitat attributes for the flammulated owl.

A habitat model for the flammulated owl that is applicable to the IPNF was applied to the project area. This model uses current TSMRS data (described previously) to assess site specific vegetative conditions and identify those areas that have the tree species

composition and structural conditions (open canopy and understory, likelihood of the presence of large diameter stands) required by this species. The model identifies both capable and suitable flammulated owl habitat. Sites identified as capable habitat include those areas that have desired tree species composition necessary to provide the required understory and overstory conditions and are considered capable of providing desired conditions. However because they currently lack the open conditions preferred and are less likely to provide large diameter snags, they are currently not considered suitable. Suitable habitat includes those sites that are likely to provide all the necessary habitat components including desired tree species, desired open canopy conditions and are more likely to have large diameter snags. Because the distribution of snags cannot be accurately predicted from TSMRS data, the model may overestimate suitable flammulated owl habitat. However it will predict sites that currently have, or have the potential to provide necessary structural conditions. As a result, it is a useful tool in assessing habitat quality, identifying those areas that are most likely to contain owls, and in assessing potential effects.

While approximately 22% of the area currently provides capable habitat, less than 1% of the area is presently considered suitable. The general absence of suitable habitat is due to the predominance of closed canopy conditions, the decline of preferred forest types (ponderosa pine) due to the development of dense stands of Douglas fir and grand fir, and the predominance of small diameter trees and limited potential to recruit large diameter snags. Although not documented within the project area, this species has been found approximately 4 miles west of the project area. Given the reduction of historic levels of ponderosa pine, flammulated owls were probably more abundant in the past than they are today. Also considering the limited amount of suitable habitat currently available, flammulated owl populations are likely to be present at very low densities within the project area.

Existing Condition–Pygmy Nuthatch

The pygmy nuthatch is a sedentary, year-round resident of ponderosa pine forests (Ghalambor 2003). It relies heavily on the foliage of live, larger ponderosa pines as foraging habitat and on larger ponderosa pine snags for nesting and roosting cavities (McEllin 1979). Their almost exclusive association with ponderosa pine, particularly mature stands that are fairly open (less than 70 percent canopy closure), leads to a patchy distribution of the pygmy nuthatch, because they mirror ponderosa pine distribution (Kingery and Ghalambor 2001; Engle and Harris 2001). Pygmy nuthatch abundance is also directly correlated with snag density and foliage volume (Ghalambor 2003). They generally excavate their own nest cavity, but at times are secondary cavity nesters and locate their nest cavities in dead trees or in dead sections of live trees (Ghalambor 2003).

The main threats to pygmy nuthatches are the loss of ponderosa pine-dominated forests and low snag densities (Ghalambor 2003). Studies have shown that due to the high dependence of pygmy nuthatch on snags, reducing the number of snags greatly reduces pygmy nuthatch densities by decreasing the availability of suitable nest and roost cavities (Balda et al. 1983; Scott 1979). Therefore, management actions should retain or restore

the long-term sustainability of ponderosa pine stands, retain and recruit large-diameter ponderosa pine snags, and reduce hazards from wildfire in ponderosa pine stands. Due to the predominance of moist sites, habitat capable of producing mature ponderosa pine-dominated forests with low stand densities and moderately open canopies is limited in the project area.

Although there are no ponderosa pine dominated stands, there are approximately 700 acres of capable habitat within the project area. Past timber harvest activities probably removed some of the dead and dying component and today insects and disease agents continue to create new snags. Although not documented within the project area, the pygmy nuthatch has been documented at two locations, including one approximately 4 miles NW in the Dawson Ridge area and one location, approximately 4 miles to the southwest. The lack of open stands of large-diameter ponderosa pine and Douglas-fir have reduced the abundance of pygmy nuthatches from historical levels and like the flammulated owl, if present, they are likely to occur at very low numbers within the project area.

Existing Condition–Fringed Myotis

The fringed myotis is a member of the group of bats referred to as the "long-eared" bats. Fringed myotis use a fairly broad range of habitats represented by open areas (e.g. grasslands) interspersed with mature forests (usually ponderosa pine, pinyon-juniper or oak) at middle elevations that contain suitable roosts sites and are near water sources (Keinath 2004). They are relatively slow but highly maneuverable flyers, and are most active the first two hours following sunset (O'Farrell and Studier 1980 *In* Keinath 2004). Fringed myotis feed on insects during flight and glean insects off of vegetation, usually near the top of the forest canopy, with beetles and moths making up the majority of their diet (Keller 2000 *In* Keinath 2004, O'Farrell and Studier 1980 *In* Keinath 2004, Wisdom et al. 2000).

Where available, fringed myotis use caves, mines, buildings and rock crevices as maternity and hibernation roost sites (Ellison et al. 2004 *In* Keinath 2004). They also roost underneath the bark and inside hollows of snags, particularly larger ponderosa pine and Douglas-fir snags in medium stages of decay (O'Farrell and Studier 1980 *In* Keinath 2004, Rabe et al. 1998 *In* Keinath 2004, Weller and Zabel 2001 *In* Keinath 2004, Rasheed et al. 1995 *In* Keinath 2004). Generally, snags used as roost sites are in somewhat open microsites within otherwise contiguous forest (Weller and Zabel 2001 *In* Keinath 2004). Because of the short lifespan of snags, bats using snags to roost require a high density of snags and often move between snags while roosting (Weller and Zabel 200 *In* Keinath 20041, Rabe et al. 1998 *In* Keinath 2004).

The main risks to fringed myotis are the loss of suitable habitat for foraging or roosting and human disturbance of roost sites. Fringed myotis, like many bat species, are very sensitive to disturbance or habitat modification and any change in conditions altering the microclimate (e.g. airflow, thermal regime) close to roosts can have a substantial impact (Keinath 2004). Fringed myotis are perhaps more vulnerable to alterations of mature or

old growth forest conditions than most bat species because of their close association with those forests that contain abundant, large snags for roosting (Keinath 2004). According to Rabe et al. (1998 *In* Keinath 2004), the use of multiple snags by roosting bats and the short-term nature of snags in the early decompositional stages of decay suggest that bats require higher densities of snags than birds. In addition, riparian areas should be managed to retain natural stream hydrology and healthy riparian vegetation to allow for sufficient water sources and to promote use by emergent insects. Therefore, management activities should, 1) manage for the retention and recruitment of large diameter snags at relatively high densities, particularly in late-successional forests; 2) protect known roost sites to prevent human disturbance or habitat alteration of microsite conditions, and 3) maintain and improve riparian areas (Wisdom et al. 2000).

Although not known to occur within the project area, a pregnant, lactating fringed myotis was documented at the Montgomery Mine in 2007, approximately 17 miles northwest of the project area. There is also an existing old-growth dry-site stand within the project area that may provide preferred roosting conditions.

Environmental Consequences–Flammulated Owl, Pygmy Nuthatch and Fringed Myotis

Methodology

As a starting point, habitat for flammulated owls was modeled using a compilation of information derived from the Forest Timber Stand Management Record System database (described previously). Following application of the model, each site proposed for treatment was visited by a wildlife biologist to validate the structural conditions identified by the model and better assess snag availability. Collectively, the model and information collected during field validation was used to identify capable and suitable flammulated owl habitat described in this report.

While it is recognized that not all stands identified as capable and suitable habitat may currently provide required habitat conditions, these stands have the greatest likelihood of providing desired habitat. Additionally stand conditions were validated on sites proposed for treatment during subsequent field reviews and collectively this information was used to predict anticipated effects described below. Because the distribution of snags cannot be accurately predicted from TSMRS data, the model may have overestimated suitable flammulated owl habitat. However it did predict sites that currently have, or have the potential to provide necessary structural conditions and as a result, was a useful tool in assessing habitat quality, identifying those areas that are most likely to contain owls, and in assessing potential effects. Finally, because the pygmy nuthatch and northern fringed myotis have similar habitat requirements (described above), effects to these species are expected to be similar to those described for the flammulated owl.

Presently 1% and 22% of the project area are considered suitable and capable flammulated owl habitat respectively.

Analysis Area

The average size home range for flammulated owls is about 40 acres (Hayward and Verner 1994). Territory size for pygmy nuthatches varies from 0.2 to 3.3 acres (Norris 1958; Balda 1967; Storer 1977), apparently as a function of the density of pines and cavity availability, whereas the territory size for the finged myotis varies but has been documented at approximately 100 acres (Keinath 2004). Considering the size of the required home range for each species, the project area is of adequate size to accurately assess the direct, indirect, and cumulative effects that may occur to these species.

Alternative 1

Direct and Indirect Effects - Alternative 1 would result in no direct impacts to flammulated owls pygmy nuthatches or fringed myotis. However if the current trend continues, forest stands would continue to decline in health and vigor, become increasingly crowded with immature, shade-tolerant trees, and have increased mortality of small- to medium-sized Douglas-fir/grand fir. As a result, shade-tolerant Douglas-fir and grand fir would continue to replace ponderosa pine, further decreasing habitat for these species. The dense, small diameter stand conditions that result under this alternative would continue to further reduce the forest structure and open canopy conditions required, as well as result in a continued decline of the ponderosa pine forest. Alternative 1 would not result in an immediate change in snags or suitable habitat. However, as the stands become crowded with immature trees, the available snags will eventually shift to small-diameter snags that are less preferred. Some large snags will continue to be present supporting low population levels of these species.

Without management intervention, the dry habitats in the project area would continue to degenerate. High fuel accumulations resulting from fallen trees would lead to greater hazards from stand-replacing fires. If a stand-replacing fire were to occur, it would take over 75 years for successional processes to restore habitat which would be similar to today's condition.

Cumulative Effects – Historic timber harvest in combination with active fire suppression have contributed to the lack of habitat that currently exists within the project area for these species. Although there are no treatments proposed, future firewood gathering may reduce available snags on a localized basis. Most of this will occur within 50 meters of a road (approximately 20% of the project area). Cumulatively under this alternative, past timber harvest, in combination with continued fire suppression and ongoing forest succession, will result in the continued loss of the dry ponderosa pine forest community. As a result, Alternative 1 will not help reverse declining trends in suitable habitat, nor will it meet the Idaho Partner In Flight objectives related to the restoration of the dry ponderosa pine community.

Effects Determination for Alternative 1

Due to the continued loss of suitable habitat and elevated hazards from wildfire, implementation of Alternative 1 ***may impact individual flammulated owls, pygmy nuthatches, fringed myotis and their habitat; however, this alternative would not contribute to a trend towards Federal listing or cause a loss of viability to the population or species.***

Alternative 2

Direct and Indirect Effects - The proposed action would treat approximately 7% of the capable flammulated owl habitat and 6% of the existing suitable habitat. Of this, 46 acres of capable and 2 acres of suitable would receive a thinning/sanitation salvage treatment, 26 acres of capable would receive a group selection/commercial thinning treatment, and one acre of suitable would receive a free selection treatment (See Table 3). All sites would receive a burning treatment within one to two years following harvest. Additionally in the event that incidental residual tree mortality occurs as a result of windstorms, ice damage, fire or insects and disease, some salvage harvest may occur in the treatment units and associated roadsides. Although the total acres treated would not change and any additional salvage would adhere to project design criteria (described below).

Although design features are in place that require the retention of large diameter snags, some cutting of snags >16" dbh may be necessary for safety or logging system requirements in all treatment units and some may be lost in subsequent burning. As a result, it is possible that any flammulated owls nesting or roosting in snags would be harmed during timber harvest and fuel reduction activities and a reduction in snag densities may impact potential nesting habitat. However considering the small amount of suitable habitat affected and widespread lack of required structural conditions that currently exists, the potential for direct impacts is extremely remote. Additionally, design features would focus on the protection and retention of large-diameter snags, especially ponderosa pine, thereby minimizing these impacts. Also, displacement may be short-term in nature, since owls would be expected to move back into some sites following treatment, as is indicated by Forest monitoring of sites receiving a thinning/burning prescription, similar to that proposed (USDA-FS 2007a). Finally, monitoring of past sites indicates that strategic placement of large snags within leave clumps is effective at retaining large snags and it is anticipated that trees suitable for nesting will continue to be available in the short and long-term.

Potential Indirect effects of management include changes in habitat suitability and will vary by treatment as follows:

> *Commercial Thinning/Sanitation Salvage and Free Selection* (47 acres capable, 2 acres suitable, 359 acres unsuitable in Units 1-3, 6-8, 14, 16-18) - One of the objectives of this alternative is to increase shade-intolerant seral species, such as ponderosa pine, western larch, and white pine, and create a more open stand of mature trees. While 50% canopy cover will be retained on sites treated and design

criteria call for the retention of large diameter snags, treatment will result in the loss of some large snags during harvest or post-harvest in subsequent fuels treatments. Also, treatment will eliminate small areas of dense small-diameter stems utilized as roosting sites. As a result over the short-term, these treatments will reduce flammulated owl habitat on the site. However over the long term (>50 years), the thinning prescription in combination with prescribed burning would improve flammulated owl habitat by managing for an older age class of ponderosa pine and Douglas-fir. Habitat improvement would also result from opening up the existing canopy and providing for understory shrub development, thereby improving flammulated owl foraging habitat (Reynolds and Linkhart 1992).

Group selection treatments (26 acres capable and 54 acres unsuitable in Unit 9 & 10) -Group selection harvest in these units should result in a clumpy distribution of remaining trees with varying overstory canopy cover. This treatment would reverse the general trend toward understory congestion and increased fire hazards in dry site stands (Unit 9), thus enhancing habitat in the long term. Treatment may result in a temporary disturbance to resident animals if present, and subsequent underburning may leave shrub and forb understory insufficient to provide preferred foraging habitat in the short term. However based on the observed response of past treatments, it is anticipated that within 2 to 3 years, the understory will have recovered sufficiently to provide habitat for the insects these species rely upon for foraging. The goal of this treatment is to improve vegetative structure and composition by featuring large-diameter seral species, ponderosa pine and Douglas Fir where they currently exist in the overstory, and to initiate or culture new ponderosa pine, Douglas fir and western larch on about 10 to 15 percent of the stands. Although proposed group selection harvest will result in small openings of up to one acre in size on 10 to 15 percent of the stand, 85-90% of the stand will continue to provide canopy closure conditions (@50%) conducive for use by flammulated owls.

Converting these high-risk stands through this prescription would provide an opportunity to alter species composition and favor the longer-lived, more disease resistance species like ponderosa pine. Therefore the prescription is expected to benefit flammulated owl habitat in the long term by re-establishing a more open-grown stand of ponderosa pine/Douglas-fir (Hayward and Verner 1994), which would lead to long-term habitat stability in the affected stand for flammulated owls.

Regeneration Harvest (See Table 1) – (50 acres unsuitable in Unit 15) – Many of the sites proposed for a regeneration treatment are showing signs of advanced insect and disease related mortality. These stands currently contain predominantly small diameter lodgepole pine, and would likely remain in this cover type without management intervention. Converting the stands through regeneration cutting methods would alter species composition and favor the longer lived, more disease resistant species like ponderosa pine. However due to the reduction in the

overstory and the reduced risk of subsequent tree mortality, these sites would not provide suitable habitat in the short them, or in the foreseeable future (<50 years). However over the long term (>50 years), this activity combined with the re-introduction of fire would promote the restoration of more open grown, older forests of ponderosa pine/Douglas-fir and help lead to long-term habitat stability for flammulated owls.

While there are no guarantees that flammulated owls will occupy these areas after treatment, most of the acres affected by treatment (75%) are not meeting habitat conditions preferred by flammulated owls, and will continue to move away from suitable condition over time. Therefore, it is expected that manipulating stands that do not currently meet species habitat requirements presents far less risk to the continued viability of the species, than lack of action would. Additionally, both the Idaho Partners in Flight (IPF 2000) and Montana Partners in Flight (MPF 2000), in their State conservation plans, recommend dry-site restoration treatments that include removal of small diameter trees and subsequent burning (as is proposed here), to enhance and/or restore habitat for this species.

Finally, because Alternative 2 will promote the long-term recruitment of higher densities of large diameter snags and maintain riparian habitat within the project area, this alternative is consistent with recommendations by Wisdom et al (2000), related to improvement of habitat for the Northern fringed myotis.

Cumulative Effects - It is estimated that up to 23% of the lands within the analysis area will be affected by future timber harvest, temporary road construction and burning proposed under Alternative 2. Additionally as described above, all of the currently capable habitat will be treated with a thinning or group selection harvest, which result in fewer and **s**horter term impacts than regeneration harvest.

Other than treatments proposed under Alternative 2, there is no additional scheduled timber harvest anticipated. However, given the history of active fire suppression, existing high fuel loads in many stands and increased fuel concentration resulting from the absence of management, it is reasonable to assume that the area will be affected by wildfire at some point in the future. The magnitude of this fire would depend upon area accessibility, available suppression resources, weather and other environmental factors. A mixed-severity fire would not likely alter large portions of available habitat, but a large stand-replacing fire would reduce the availability of habitat for several decades. However because conditions will be reduced on much of the project area, the possibility of a severe stand replacing fire and an associated reduction in habitat will be greatly reduced under this alternative.

Because non-federal land is already well roaded, there is no additional new road construction anticipated. However additional timber harvest may take place on non-federal lands within the project area and based on past activities, it is anticipated that potentially suitable flammulated owl habitat will be reduced on another five to seven percent of these lands. Although due to the uncertainty of management actions and lack

of detailed habitat data on these ownerships, the USFS assumes no contribution of suitable habitat for sensitive species/MIS from adjacent property.

Cumulatively during the analysis period, it is estimated that up to 70% of the project area will have received some form of timber harvest, with up to approximately 22% of this occurring as regeneration harvest. Although considering that over 80% of the analysis area is presently considered unsuitable, and considering implementation of design features will reduce impacts on sites treated, potential impacts to this species from implementation of Alternative 2 are not considered significant. Also because proposed timber harvest and prescribed burning in dry-site forest stands are designed to mimic or move these stands toward structural conditions this species prefers, implementation of Alternative 2 will help reverse declining trends in suitable habitat and help to achieve the Idaho Partner In Flight objectives, related to the restoration of the dry ponderosa pine community (IPF 2000).

Effects Determination for Alternative 2

While implementation of Alternative 2 may result in disturbance to flammulated owls during project implementation, as well as a reduction in habitat in treated areas, over 90% of the existing suitable habitat within the project area will be maintained. In addition, approximately 93% of the capable habitat will be unaffected and approximately 76 acres of existing capable habitat will be trended toward a suitable condition of open grown ponderosa pine. As a result, over the long term it is anticipated that implementation of the proposed action will improve habitat for the flammulated owl. Also considering that over 90% of existing suitable habitat will be unaffected, the distribution of this species would be maintained and the proposed action would not be expected to result in a local or regional change in habitat quality or population status Further, Samson (2006) concluded that short-term viability of the flammulated owl in the Northern Region is not an issue because:

- No scientific evidence exists that the flammulated owl is decreasing in numbers.
- Increases in the extent and connectivity of forested habitat have occurred since European settlement.
- Well-distributed and abundant flammulated owl habitat exists on today's landscape.
- The level of timber harvest in the Northern Region is insignificant (in 2006, 6,876 ha of 9,045,255 ha or 0.08% of the forested landscape) and IPNF (1,397 ha of 999,733 forested ha or 0.14%) (http://www.fs.fed.us/r1/forest_range/timber_reports/timbersales.shtml).

As a result, implementation of the Twin Skin project, ***may impact individual flammulated owls, pygmy nuthatches or fringed myotis and their habitat, however Alternative 2 will not contribute in a trend towards Federal listing,*** cause a loss of viability or a reduction in local or regional populations for these species**.**

Consistency with Forest Plan and Other Regulations

Because Alternative 2 will maintain suitable roost trees and provide for the long-term increase in suitable habitat, it complies with Forest Plan direction to manage habitat of species listed on the Regional Forester Sensitive Species list and to prevent further declines in populations, which could lead to Federal listing under the Endangered Species Act (USDA 1987 p. II-28). In addition, because over 90% of suitable habitat within the project area will be unchanged and viable populations of these species will be maintained, Alternative 2 is consistent with National Forest Management Act (NFMA) requirements for providing for diversity of animal communities (16 USC 1604((g)(3)(B)).

Black-backed Woodpecker

Existing Condition

The black-backed woodpecker is a year-round resident occurring in various forest types over a wide elevation range. It is regarded as a narrow endemic (a species ecologically restricted to very specialized habitats), responding positively to fires and other large-scale disturbances.

A Wyoming/Montana study conducted by Hutto (1995) revealed that the species is nearly restricted to early post-fire habitats. While populations are irruptive in response to beetle outbreaks connected to recent fires, source habitats include late-seral forests (Wisdom et al. 2000). Forests that contain patches of beetle-infested trees may provide adequate habitat to support baseline (source) populations of black-backed woodpeckers when burned areas are not available (Montana Partners in Flight 2000).

In a study that involved stand-replacement fires and subsequent salvage logging, Saab and Dudley (1998) found that black-backed woodpeckers favored the un-logged controls for nesting. These areas were characterized as sites with high densities of relatively small, hard snags. Compared to other cavity-nesting birds, black-backed woodpeckers selected nest sites with the highest densities and the smallest diameters of snags (Saab and Dudley 1998). Due to past and on-going mortality that is occurring across the district, including the Twin Skin project area, it is estimated that small diameter snags (10” to 19.9” dbh) occur at a density of 9.9 snags/acre USDA 2006) and as a result, potentially suitable habitat is available.

Black-backed woodpeckers tend to move from area to area as suitable habitat develops (recent fires, insect infestations). In the absence of active management, tree mortality would continue to provide source level nesting and foraging habitat. Black-backed woodpeckers have been documented immediately west of the project area near Eileen and at Perkins lake, approximately 1 mile southeast of the project area. Although there have been no recent fires, considering mountain pine beetle mortality is widespread, it is likely that baseline populations of this species occur within the project area and that their population would remain at low endemic levels due to the absence of recent fire.

Environmental Consequences

Methodology

Potential black-backed woodpecker habitat was initially derived from modeling stand conditions provided in the Forest TSMRS database. Specific paramaters analyzed include changes in distribution of quality snag habitat by modeling USFS-managed property covered with pole-sized or larger timber that has not had any harvest for the last 20 years and is more than 50 m from a road (i.e. unlikely that snags would be taken as firewood). While it is likely this approach overestimates the number of snags and there is no assurance that areas that meet the model criteria have high snag densities, given the increasing rate of moratality due to insects and disease, it is reasonable to assume that small pockets of morality scattered throughout the project area are providing suitable black-backed woodpecker habitat on these sites. Additionally, stand conditions were validated on sites proposed for treatment during subsequent field reviews and collectively this information was used to predict anticipated effects described below.

Analysis Area

The typical home range size for black-backed woodpeckers is approximately 870 acres. Forests that contain patches of beetle-infested trees may provide adequate baseline habitat and black-backed woodpeckers tend to move from area to area as suitable habitat develops (recent fires, insect infestations). As a result the project area, which includes approximately 3100 acres of NFS lands and is large enough to assess anticipated effects to this species.

Alternative 1

Direct and Indirect Effects - Implementation of the no action alternative would not result in an immediate change in snags or suitable habitat for black-backed woodpeckers. If management techniques were not implemented, forest stands would continue to decline in health and vigor, eventually resulting in high levels of tree mortality favorable to black-backed woodpeckers. Over time, the available snags would shift to dense stands of smaller diameter snags desired by black-backed woodpeckers. As species such as ponderosa pine, western larch, and white pine are replaced by shade-tolerant species, the stands would accumulate high fuel loads, putting them more at risk for intense fire and continued disease outbreaks. These disturbances would result in increased black-backed woodpecker habitat.

Cumulative Effects – Potential cumulative effects to this species result from any activities that reduce small diameter snags including, timber harvest, firewood gathering, road construction and land development, as well as forest succession and forest health concerns, that would result in an increase in tree mortality. It is estimated that approximately 70% of the analysis area will have been affected by past timber harvest, road construction and land development during the analysis period and there would have been a reduction in habitat on these areas. However due to the existing stand conditions and insect and disease related tree mortality, as well as the natural thinning that results due to the overstocked conditions that exist across the project area, new snags would

have been recruited into many of the sites affected by past activities, as well as on untreated areas. As a result, black-backed woodpecker habitat will continue to be available across much of the project area. Finally, because of the increased risk of wildfire that will occur under this alternative, it is likely that large acreages within the project area could be burned through future wildfire and subsequently improve habitat for this species on the acreage affected.

Determination for Alternative 1

Due to the lack of management, there will be greater hazards and loss of habitat from future wildfire under Alternative 1 and this alternative may affect individual black-backed woodpeckers and their habitat. However suitable nesting and foraging would be more widespread following fire and as a result this alternative ***may impact individuals or habitat, but will not contribute to a trend towards Federal listing,*** cause a loss of viability or a reduction in local or regional populations**.**

Alternative 2

Direct and Indirect Effects - The proposed action would treat 713 acres that could potentially be providing black-backed woodpecker nesting and foraging habitat and reduce the quality and quantity of black-backed woodpecker habitat on this acreage. Black-backed woodpeckers tend to prefer dense stands of small- to medium-diameter recently fire-killed trees. Alternative 2 would develop more open, fire-resistant stands with larger diameter trees. Alternative 2 does however incorporate wildlife tree retention measures to mitigate the impacts to snag habitat and following Regional snag protocols would help ensure that an adequate number of snags and snag recruits are retained (see Project Design Features). Snag retention objectives on dry sites would be a minimum of four snags per acre with replacement of eight live trees per acre from the largest trees. On moist sites, snag retention objectives would be retention of a minimum of 6 snags and replacement of 12 live trees per acre from the largest trees. Studies indicate that this ratio of snags would provide habitat to maintain viable woodpecker populations (Bull et al. 1997).

Alternative 2 would also result in a reduction in snag habitat in the project area over the short-term by reducing the number of densely spaced, small and intermediate trees and snags, as well as excess fuels. Indirect impacts associated with the implementation of Alternative 2 would be a reduction in the level of insect and disease-related tree mortality and recruitment of future small diameter snags within treated stands. The proposed temporary road construction (@ 5 acres) would likely enter and remove small pockets of dense trees and snags on up to five acres, whereas prescribed burning could create new snags on up to 296 acres proposed for underburning. Other proposed management activities such as fire line construction, road maintenance and improvement and landing construction may also result in the felling of snags and localized reductions in suitable black-backed woodpecker habitat. These activities, as well as proposed timber harvest and burning also have the potential to result in disturbance and short-term displacement and behavioral avoidance of the treatment area (23% of the project area).

Other than treatments proposed under Alternative 2, there is no additional scheduled timber harvest anticipated. However in the event that incidental residual tree mortality occurs as a result of windstorms, ice damage, fire or insects and disease, some salvage harvest may occur in the treatment units and associated roadsides. These treatments could result in the additional loss of black-backed woodpecker habitat on these sites.

Areas outside of proposed treatment areas would continue to be susceptible to insect and disease, thereby perpetuating small to medium sized snag habitat for black-backed woodpeckers. Forest Inventory and Analysis (FIA) data demonstrate that forested USFS lands on the Bonners Ferry/Kootenai Geographic Area contain an estimated 9.9 snags/acre (90% confidence interval) between 10" and 19.9" dbh (USDA 2006). In addition, annual aerial surveys of new insect-induced tree mortality across the Bonners Ferry Ranger District conducted by USFS Forest Health Protection personnel have shown that bark beetles infested an average of almost 4,000 acres per year from 1990-1998 across the District, and the level of new infestation increased to over 20,000 acres from 1999-2000 (S. Kegley, pers. com.). This higher rate of infestation and mortality is expected to continue for the next few years due to increasing mountain pine beetle, western balsam bark beetle and fir engraver populations, especially if drier than normal weather conditions continue (USDA-FS 2007a). Furthermore, mortality due to root diseases is not included in aerial survey data and has been steadily increasing. This data indicates that snag and down woody debris recruitment from insects and disease activity from 1990 through 1998 have been occurring at a steady rate of about two to five percent of the District per year and increased to around six to 22 percent of the District from 1999 to the present (USDA-FS 2007a). Based on the existing and predicted increase in snag levels over the project area, there should continue to be a quantity of snags less than 20" dbh that can be considered in excess of those necessary to meet the Northern Region Snag guideline recommended levels. As a result, although the proposed actions would reduce the quantity of available snag habitat, tree mortality would continue to persist in adjacent areas, allowing black-backed woodpeckers to maintain populations at their present levels.

Cumulative Effects - Potential cumulative effects include timber harvest, insect and disease related tree mortality, fire suppression and firewood collection. Since the early 1970's, it is estimated approximately 50% of the lands within the project area have received some form of timber harvest. Although snag retention and snag recruitment (leaving higher densities of green trees for future snags) have recently improved in harvested areas through implementation of Forest Plan standards and, more recently, by adoption of the Northern Region Snag Protocol (USDA 2000), virtually all of this past timber harvest would have reduced small diameter snag densities on this area. Additionally, past and future firewood collection has and will continue to reduce snags within 50 meters of open roads and collectively it is estimated that small diameter snags may have been reduced on up to approximately 70% of the project area during the 48 year analysis period. However as described above, due to insect and disease related mortality, there has been and will continue to be a steady increase in small diameter snags. As a result, suitable black-backed woodpecker habitat will continue to be available on un-treated sites, as well as on many of the stands that have previously been

harvested for timber. Also un-treated sites would contain higher densities of small diameter snags and adequate habitat would continue to be available to support endemic population levels of this species.

Because the black-backed woodpecker is largely a fire dependent species and considering fuels treatments will reduce the possibility of wildfire, future habitat for this species will be reduced under this alternative.

Determination for Alternative 2

Although the action alternatives would reduce the quantity of available snag habitat, tree mortality would continue to persist in the analysis area, allowing black-backed woodpeckers to maintain populations at low endemic levels and their current distribution would be sustained. This is supported by Samson (2005), who concluded that short-term viability of the black-backed woodpecker in the Northern Region and on the IPNF is not an issue because:

- No scientific evidence exists that the black-backed woodpecker is decreasing in numbers.
- Increases in the extent and connectivity of forested habitat have occurred since European settlement.
- Increases in amounts of small and mid-size trees have increased since European settlement.
- Well-distributed and abundant black-backed woodpecker habitat exists on today's landscape.
- Level of salvage timber harvest (in 2004, 1,210 ha of 2,276,588 ha or 0.0005%) or overall timber harvest (8,581 ha of 9,045,255 or 0.0009% of forested landscapes in the Northern Region) is insignificant.

As a result, implementation of Alternative 2 ***may impact individuals or habitat, but will not contribute to a trend towards Federal listing,*** cause a loss of viability or a reduction in local or regional populations.

Consistency with Forest Plan and Other Regulations

Because adequate habitat will continue to be available, both alternatives comply with Forest Plan direction to manage habitat of species listed on the Regional Forester Sensitive Species list and to prevent further declines in populations, which could lead to Federal listing under the Endangered Species Act (USDA 1987 p. II-28). In addition, because adequate habitat is available to support current populations of this species, both alternatives are consistent with National Forest Management Act (NFMA) requirements for providing for diversity of animal communities (16 USC 1604((g)(3)(B)).

Fisher

Existing Condition

Fishers are low-density forest carnivores, occurring most commonly in landscapes dominated by late-successional forests with complex forest structure and high canopy

cover, especially in riparian areas (Ruggiero et al. 1994). While summer use is generally restricted to mature and old-growth grand fir and spruce forests, winter use can also include Douglas-fir and lodgepole pine forests in a variety of successional stages (Jones 1991, Heinemeyer and Jones 1994). Although fishers are normally tolerant of human activities, human access to occupied areas may negatively affect fisher populations, as this species is easily trapped. The only recent verified sightings of fishers on the Bonners Ferry Ranger District have been in the Selkirk Mountains, more than 20 miles to the west of the Twin Skin project area and in the Boulder Creek vicinity, 10 miles south of the project area (S. Cushman personal communication).

Although fisher are selective in their use of habitats, home ranges typically encompass a diversity of plant communities. In the west, fishers are generally found in conifer-dominated forests containing a diversity of habitat types and successional stages. Fishers are closely associated with forested riparian areas, which are used extensively for foraging, resting and as travel corridors (USDA 1994).

Grand fir habitat types similar to those in the project area are used by fishers. Mature and old growth coniferous forests have commonly been described as optimal or preferred fisher habitat. Although a seasonal shift in the use of successional stages has been documented (Jones and Garton 1994 *In* USDA 1994) and while fisher were detected almost exclusively in mature/old growth habitat in the summer, a combination of mature/old growth and young stands were utilized in the winter months, with young stands being preferred at this time of year. While mature forests were utilized more for resting and reproduction, a broader range of habitats, including young stands is utilized for hunting (Jones 1991 *In* USDA 1994).

The Twin Skin project area currently has 82 acres (two sites) of suitable habitat in the northern portion of the project area, whereas capable habitat is widely distributed and occurs on almost 70 percent of the area. Capable habitat is currently dominated by small-diameter (less than 15 inches) trees, and these stands are deficient of large-diameter dead and down material that fishers prefer for denning.

Environmental Consequences

Methodology

Fisher/marten habitat was evaluated using a habitat suitability model derived from data in the Forest timber stand database (TSMRS). Modeling rules and assumptions can be found in the project file. The analysis is based on management guidelines from *Fisher Biology and Management in the Western United States* (Heinemeyer and Jones 1994) and *DRAFT, Forest Carnivores in Idaho* (IDF&G 1995). Although the guidelines make a distinction between “preferred” and “suitable” habitat, they are grouped together to assess habitat quality; and so were not separated for this analysis. IDF&G (1995) also makes minor distinctions between fisher and marten habitat, but *Martes* species were treated as a guild in this assessment. Additionally, stand conditions were validated on sites proposed for treatment during subsequent field reviews and collectively this information was used to predict anticipated effects described below.

Because of their preference for older stands with dense canopy cover and large snags (used for maternal dens), suitable fisher habitat closely mimics that required for other old-growth indicator species such as goshawk and pileated woodpecker. However, unlike goshawks, fishers prefer stands with congested understories for the cover these stands offer for hunting and avoiding predators. The potential effects on the fisher and its habitat were determined by predicting the change in habitat suitability that would result from each alternative.

Analysis Area

Although the project area lacks the large snag component preferred by fisher for denning, forest communities contained within the area include some old growth and sawtimber sized trees, preferred forest types (e.g congested grand fir), riparian forest and a young forest component utilized during the winter months. Because the project area contains an adequate mix of habitats utilized by the fisher, this area was used to assess direct, indirect and cumulative effects. Also levels of anticipated activities and habitat conditions are representative of those on similarly managed lands.

Alternative 1

Direct and Indirect Effects – Because no activities are proposed, the no action alternative would preserve potential foraging habitat and continue to provide preferred closed canopy conditions. There would be no change in access under this alternative and as a result, no anticipated increases in mortality from trapping or other human interaction. Fisher habitat will be largely unchanged under this alternative and will occur on approximately 70% of the project area.

Although cover will be improved under this alternative, given the history of active fire suppression, existing high fuel loads in many stands and increased fuel concentration resulting from the absence of management, it is reasonable to assume that the area will be affected by wildfire at some point in the future. The magnitude of this fire would depend upon area accessibility, available suppression resources, weather and other environmental factors. A mixed-severity fire would not likely alter large portions of available habitat, but a large stand-replacing fire would reduce the availability of habitat for several decades. So while the no action alternative would provide fisher habitat in the future, some of these acres may subsequently be converted to an unsuitable condition through wildfire.

Cumulative Effects – Past and more recent logging within the project area have reduced fisher habitat by removing forest canopy, large snags and dead and down material on approximately 50% of the area. In addition, firewood cutting along seasonally and yearlong open roads has and will continue to reduce snags and downed woody debris preferred by this species within 50 meters of open roads (approximately 22% of the project area). Although preferred den habitat away from roads would be unaffected.

Additional timber harvest (@120 acres) may also take place on non-federal lands within the project area and it is anticipated that potentially suitable fisher habitat will be reduced

on these lands. Cumulatively it is estimated that up to 70% of the analysis area may have been affected by past timber harvest, approximately 22% of which consisted of regeneration harvest that would have resulted in a long-term loss of suitable cover. However due to increases in canopy closure, much of the acreage affected by past partial harvest activities would now provide desirable cover conditions. Also desirable habitat conditions will continue to develop on these areas, as well as un-treated sites, due to the overstocked conditions that occur across the project area and increasing tree mortality and associated increases in downed woody debris.

Ongoing activities such as firewood collection, road maintenance, dispersed recreation, collection of special forest products (e.g Christmas trees & wreaths) and noxious weed treatment along road corridors will continue to occur and may be a source of disturbance. However much of this will be concentrated along open roads, many of which already have year-long access. As a result, the level of disturbance is not expected to increase and potential disturbance to more remote habitat would be minor.

Determination for Alternative 1

Although current cover conditions would be improved under this alternative, stand replacement wildfire would be more likely under Alternative 1. As a result, this alternative ***may impact individuals or habitat, but will not contribute to a trend towards Federal listing,*** cause a loss of viability, or a reduction in local or regional populations.

Alternative 2

Direct and Indirect Effects – Proposed timber harvest could affect fisher habitat by reducing the forest canopy, and reducing structural characteristics such as snags, and downed woody material. Although timber harvest will occur on 633 acres of capable denning habitat, 80% of this occurs as smaller diameter stands less preferred by fisher. Also 71% of the existing capable and 100% of the existing suitable fisher habitat will be unaffected. In the event that incidental residual tree mortality occurs as a result of windstorms, ice damage, fire or insects and disease, some additional salvage harvest may occur in the treatment units and associated roadsides. Although the amount of capable and suitable habitat will be unchanged, existing roads, landings and skid trails will be used and all treatments would adhere to site specific design criteria that call for the maintenance of large diameter snags, as well as a downed wood component. There may also be some collection of special products from pre-commercial thinning sites.

Although a downed woody debris component will be retained on all sites proposed for treatment, because the DFC for the project area includes a reduction in fuels to reduce the hazards associated with wildfire, proposed treatments will reduce downed woody debris to levels below those preferred by the fisher (USDA 1994) on sites treated. However over 74% of existing capable and suitable fisher habitat will remain un-treated and will continue to provide current levels of downed woody debris. Also, considering much of the project area will continue to be subject to increased levels of tree mortality and subsequent recruitment of standing and downed woody debris across the landscape, adequate levels of downed woody debris will continue to be available to meet the needs of this species.

Proposed burning is expected to have some direct effects on fisher/marten if they are occupying the site at the time of treatment. While behavioral avoidance of fire by wildlife is documented by Landers (1987) and it has been observed that less mobile species such as small rodents are most likely to panic, larger mammals usually move calmly during a fire. Also most un-desirable direct effects are overcome by choosing proper times, places and methods of prescribed burning. Since proposed underburning will consist of a relatively slow moving strip headfire or backing fire, and will be done an a small scale, direct mortality resulting from proposed burning is not anticipated and direct effects will be limited to possible temporary displacement from the treatment area during implementation.

Stand level objectives related to fisher management, including those areas managed through even-age timber harvest, include; 1) manage stands treated through timber harvest in a manner that allows rapid re-colonization of preferred prey (e.g. snowshoe hare, red-backed voles) and subsequently fishers, 2) manage forested riparian areas conservatively, 3) retain at least 12 trees/ha greater than 46 cm dbh for future snag and den/log recruitment, 4) retain 50-100 tons/ha of large diameter logs for prey habitat and future rest sites, 5) retain some slash piles (1 per 2 ha) for potential fisher rest sites and prey habitat and 6) no more than 60% of regenerated stands should be pre-commercially thinned (USDA 1994). As described previously, sites proposed for treatment will not provide desired levels of downed woody debris, although design criteria include maintaining at least 1 slash pile/acre on approximately 70% of the sites treated. Also with implementation of project design criteria, live tree replacement objectives described above will be achieved on 95% (moist forest) of the sites treated and there is no pre-commercial thinning proposed on regenerated stands. So while there will be a reduction in habitat on sites treated, many of the desired structural components will be retained. Additionally there are no treatments proposed within 100 meters of any stream and all existing riparian habitat will be maintained. Considering that during the summer months, 50% to 70% of the fisher observations were within 100 meters of water (USDA 1994), retention of riparian habitat will also help ensure that connectivity between suitable habitat within and adjacent to the project area is provided for.

In addition to stand level recommendations, guidelines for fisher management include maintaining the habitat structure and composition across the drainage or watershed (USDA 1994). Because there is very little remote habitat within the Twin Skin project area, the project area is considered a moderate to low quality drainage and in these areas, management should strive to; 1) maintain 30% to 50% of preferred and suitable habitat as mature or older forests, and 2) maintain 60% of preferred habitat as connected travel corridors (USDA 1994). Although Alternative 2 will treat 633 acres of capable fisher habitat, approximately 1639 acres or 72% of existing capable/suitable will remain un-treated. Considering these untreated areas are all interconnected through riparian corridors, sub-drainage level objectives identified above will be maintained and habitat for fisher will continue to be available across the landscape.

Finally, while logging will reduce cover and structure, over the long term (>75 yrs), treatment would encourage growth of large diameter larch, white pine and Douglas-fir and this increase in stand diameter, as well as improved stand structure provide desired fisher habitat in the future. Like Alternative 1, there would be no change in access under this alternative and there will be no anticipated increases in mortality from trapping or other human interaction.

Cumulative Effects – Like Alternative 1, past timber harvest has reduced suitable habitat for fisher within the Twin Skin project area and other than treatments proposed under Alternative 2, there is no additional scheduled timber harvest anticipated. Current activities such as firewood collection, dispersed recreation and occasional noxious weed treatment along road corridors will continue and may be a short-term, localized source of potential disturbance to fishers. However much of this will be concentrated along open roads and the level of disturbance or trapping is not anticipated to increase. Also as described under Alternative 1, these areas provide little if any den habitat. Additional timber harvest may also take place on non-federal lands within the project area and it is anticipated that cumulatively during the analysis period, up to 70% of the area will have been affected by some form of timber harvest and that preferred habitat conditions would have been reduced on this area. However as described under Alternative 1, due to increases in canopy closure, most of the acreage affected by past partial harvest activities (68% of past harvest) would now provide desirable habitat. Also desirable habitat conditions will continue to develop on these areas, as well as un-treated sites, due to the overstocked conditions that occur across the project area and increasing tree mortality and associated increases in downed woody debris. As a result, cumulative effects to fisher habitat are reduced.

While anticipated timber harvest will reduce fisher habitat, over 50% of the area will continue to occur as interconnected fisher habitat. Also approximately 70% of the project area will be characterized by forested stands that contain predominately sawtimber sized trees with at least 50% canopy closure, so for these reasons the project area will continue to provide suitable cover conditions required by this species. Finally because there will be no increase in permanent roads or changes in road management, remote habitat will remain unchanged under this alternative and there will be no anticipated increases in fisher/human interaction.

Determination for Alternative 2

Although proposed timber harvest will reduce stand structure on 663 acres, there will be no reduction in existing suitable habitat. Also riparian habitat will be unaffected by treatment and connectivity between suitable habitat within and adjacent to the project area will be maintained under this alternative. Consequently, and considering there has been no documentation of fisher/marten near the project area, the proposed action ***may impact individuals or habitat, but will not contribute to a trend towards Federal listing,*** cause a loss of viability, or a reduction in local or regional populations.

Consistency with Forest Plan and Other Regulations

Because adequate habitat will continue to be available to support existing use of the area by fisher, both alternatives comply with Forest Plan direction to manage the habitat of species listed in the Regional Sensitive Species Lists and to prevent further declines in populations, which could lead to Federal listing under the Endangered Species Act (USDA Forest Service 1987, p. II-28). Also both alternatives are consistent with the National Forest Management Act requirements for providing for diversity of animal communities (16 USC 1604((g)(3)(B)).

Western Toad

Existing Condition

Western toads are most common near marshes and small lakes, but may wander great distances through dry forests or shrubby thickets. In contrast to the jumping habits of frogs, toads move overland by climbing or crawling. Outside of breeding season (February to April, Leonard et al 1993), western toads are nocturnal, spending the day buried in the soil, concealed under woody debris, or in the burrows of other animals. Western toads breed in lakes, ponds, streams, and road ditches, with a preference for shallow areas with mud bottoms. Historical data indicate that western toads were widely distributed and common, but the species has apparently undergone severe population declines in the past 25 years (Currim 1996). Surveys in the late 1990s indicate that they are absent from many historic locations and that they now occupy less than 10 percent of the suitable habitat (Maxell 2000). Western toads are sensitive to environmental changes caused by human development and disturbances to natural habitat; principally the loss of wetlands (Leonard et al. 1993).

Although there is no documentation of western toads, shallow backwater areas along the Moyie River and lower reaches of Skin and Deer Creeks provide potentially suitable habitat within the project area.

Environmental Consequences

Methodology

The potential effects on western toads and its habitat were derived from an assessment of potential impacts to breeding habitat and considered the risk of mortality to individuals.

Analysis Area

Male western toads in Idaho traveled on average 0.36 mile from the breeding pond and females on average traveled 0.69 mile. The farthest distance for a male to travel was 0.58 mile, while the female traveled 1.5 miles (Natureserve 2007). Based on home range size and dispersal distances, the project area is of adequate size to assess direct, indirect, and cumulative effects to this species.

Alternative 1

Direct and Indirect Effects – Since there are no actions proposed under this alternative, there are no direct or indirect effects to breeding habitat anticipated. However given the history of active fire suppression and existing high fuel loads in many stands, it is reasonable to assume that the area will be affected by severe wildfire at some point in the future and if this occurs, direct mortality and impacts to breeding habitat could occur.

Cumulative Effects – Western toads, like many other amphibians, are sensitive to environmental changes caused by human development and disturbances of habitat (Leonard et al 1993). As a result, past timber harvest, road construction and maintenance, loss of wetlands due to development, periodic flooding, and fires and firefighting, have all likely affected the western toad and its habitat within the project area, as well as across the Idaho Panhandle National Forests. Periodic road maintenance, specifically cleaning out roadside ditches, has probably also impacted western toads if tadpoles were present and dependent on ditch water. Future activities under this alternative that may affect this species include continued road maintenance, dispersed recreation, harvest on non-federal lands, fire suppression and possible noxious weed control along roads. Although up to 22% of the area (lands within 50 m of a road) could be affected, because these activities largely occur away from breeding habitat and because associated use is scattered and in-frequent, there is only a remote possibility that impacts to the Western toad will occur.

Effects Determination for Alternative 1

This alternative may affect individual western toad and their habitat. However breeding habitat will be unchanged and potential for disturbance/mortality is extremely remote. As a result, implementation of Alternative 1***, may impact individuals or habitat, but will not contribute to a trend towards Federal listing,*** cause a loss of viability or a reduction in local or regional populations.

Alternative 2

Direct and Indirect Effects - Western toads have been documented traveling more than 1.5 miles from aquatic habitats following their breeding season. Although there are no treatments proposed near preferred aquatic breeding habitat, there is a remote possibility that individual toads could be temporarily displaced or killed due to proposed timber harvest, burning, road construction or road maintenance.

Western toads use a variety of upland areas, however potentially suitable breeding habitat will be unaffected by treatment and considering some low cover will be maintained on all sites proposed for treatment, areas affected could continue to be utilized for dispersal. Indirect effects to breeding habitat could occur if there is increased sediment delivery to wetlands and waterways resulting from proposed road work and timber harvest. However BMPs are in place to protect water quality and fish habitat and considering that INFS protection measures will be implemented to protect waterways and wetlands, impacts to western toads should be minimal.

Cumulative Effects – In addition to past and anticipated future cumulative effects described under Alternative 1, the proposed action would affect approximately 718 acres (timber harvest, burning and temporary road construction) of upland habitat within the Twin Skin project area. However no treatments will be implemented within 100 meters of any stream and no wetlands or preferred breeding habitat will be adversely affected. Also as described above, implementation of project design features will minimize impacts to water quality and for these reasons, there are no significant effects to this species anticipated under Alternative 2.

Effects Determination for Alternative 2

Although implementation of Alternative 2 may modify upland habitat and result in a short-term increase in use of existing roads and potential for mortality to toads dispersing from breeding habitat, because there are no treatments within 300 ft of any stream and preferred wetland breeding habitat will be unaffected, the potential for disturbance or mortality is extremely remote. As a result, implementation of Alternative 2 ***may impact individual western toads or their habitat, but would not contribute to a trend towards Federal listing or cause a reduction of viability to the population or species.***

Consistency with Forest Plan and Other Regulations

Because preferred breeding habitat is unaffected, both alternatives comply with Forest Plan direction to manage the habitat of species listed in the Regional Sensitive Species Lists and to prevent further declines in populations, which could lead to Federal listing under the Endangered Species Act (USDA Forest Service 1987 p. II-28). In addition, all alternatives are also consistent with National Forest Management Act requirements for providing for diversity of animal communities (16 USC 1604((g)(3)(B)).

Management Indicator Species (MIS) and Others

Northern Goshawk

Existing Condition

The goshawk is a forest habitat generalist, although, due to its large size and wingspan, it tends to avoid young, dense forests. Optimal habitat consists of forest stands with canopy cover greater than 60 percent, overstory tree sizes greater than 15 inches in diameter, and a presence of dead or defective trees greater than 10 inches in diameter.

Goshawks typically select large trees with northerly exposures for nesting (Hayward and Escano 1989). Nesting pairs of goshawks in the northern Rocky Mountains often have 6,000-acre home ranges (Reynolds et al. 1992). Goshawks typically use three to nine alternate nest sites distributed among one to five different forest stands (Woodbridge and Detrich 1993). The post-fledging area surrounds the nest site and is used by the fledglings prior to independence from their parents. The critical post-fledgling area contributes to the survival of young goshawks and typically occurs within 420 acres of the nest tree (Reynolds et al. 1992). Young goshawks typically fledge by July and use the post-fledging area for 4 to 6 weeks (Bull and Hohmann 1994). Additional feeding habitat surrounds the nest within the home range. Optimal goshawk nesting habitat has

approximately 30 acres for the nest site, 420 acres for the post-fledging area, and 5,400 acres for adjacent foraging habitat (Reynolds et al. 1992). These habitat features should be contiguous and meet habitat requirements to support a nest site and alternate nest sites.

Existing goshawk habitat within the project area has been largely determined by past actions including intensive timber harvest, wildfire and decades of fire suppression. Today's landscape contains small remnant pockets of individual legacy white pine, ponderosa pine, and western larch. Douglas-fir and grand fir have replaced much of the growing space once occupied by these species. Controlling wildfires since the early 1900s has also reduced age-class diversity and much of the project area is dominated by an immature forest (80- to 90-year-old trees) with relatively dense understories of Douglas-fir and grand fir regeneration. Other stands have large trees, but also have dense understories. While there can be minor variations of forest structure within stands that provide nesting possibilities, the prevalence of immature trees leads to unsuitable nesting conditions. So while almost 60% of the project area is considered capable goshawk nesting habitat, currently only 11% of the project area is suitable, although most of this has been field checked and is considered validated suitable habitat. Approximately 165 acres of the existing suitable habitat occurs in or adjacent to units 16-18 in the Solomon Mountain area, whereas approximately 155 acres occurs in the southeast corner of the project area, in or adjacent to units 10, 13, 14 and 15.

There are three historic documented territories within one mile of the project area. The Skin Creek territory occurs in the east portion of the project area approximately 500 ft. north of Skin Creek, whereas the Perkins I and II territories occur approximately 0 .9 and 0.5 miles southwest of the project area respectively. Goshawk detection surveys were conducted within the project area in 2007. Although a foraging bird was detected in Unit 18, no nests were discovered as a result of these surveys and there has been no documented nesting in or near the project area in the last five years.

Environmental Consequences

Methodology

Goshawk nesting habitat was evaluated using a habitat suitability model derived from stand level data related to the Forest timber stand database (TSMRS), in combination with topographic information from digital elevation model (DEM) data. While suitable northern goshawk nesting habitat was initially determined using the Forest-wide HSI model (see Interpretation of IPNF Wildlife Queries, project file), habitat suitability was validated for a large portion of suitable stands in the project area through site visits or by comparing data with other sources such as aerial photographs and field reconnaissance notes. Capable habitat for northern goshawks includes stands of moderately dry Douglas-fir or grand fir, moist grand fir, western red cedar and western hemlock (habitat type groups 2–6), with 40 percent slope or less (Hayward and Escano 1989; Warren 1990; Reynolds et al. 1992; and Graham et al. 1999). Suitable habitat generally consists of stands in the later stages of succession (mature and old growth trees) having moderate to high tree densities (canopy cover of 50 percent or more).

Analysis Area

The project area contains a mix of habitat conditions that are representative of adjacent lands within the affected watersheds and is representative of the surrounding landscape. As a result, the project was used to assess direct, indirect and cumulative effects to the northern goshawk and its habitat. However, because nesting goshawks in the Rocky Mountains often have 6000 acre home ranges (Reynolds et al 1992), habitat availability was also assessed on the larger, 32,000 acre area that comprises NFS lands within watersheds included in the Twin Skin project area.

Alternative 1

Direct and Indirect Effects - Because there are no actions proposed, this alternative would have no direct impacts on goshawks. However there would be indirect effects to goshawk habitat as forest stands continue to increase in stem densities and understory congestion. These stands would continue to decline in vigor and would become increasingly crowded with immature trees. The high amount of ladder fuels will prevent natural fire from clearing out the understory. Large snags will eventually disappear, trending these stands even further away from suitable goshawk nesting and foraging habitat. A large stand-replacing fire would remove the dense forests this species prefers, but small fire-produced openings may be beneficial for foraging. Regardless of whether these stands suffer from stand-replacing fire or not, due to the above stand conditions, suitable goshawk nesting habitat will likely be reduced over time under this alternative.

Cumulative Effects - Past activities within National Forest System lands that can affect the goshawk or its habitat include logging, fire suppression, road development, and recreation. Fires in the 1920's and 1930's have affected goshawk habitat by setting back forest vegetation to an early seral stage on lands affected. Forest succession and fire suppression continue to alter goshawk habitat within the project area by increasing small diameter stem densities and forest health concerns, which cause a change in forest structure that will continue to reduce suitable goshawk nesting habitat.

Approximately 50% of the analysis area has been affected by past logging. While nesting habitat would have been reduced on the sites treated, sites affected by these treatments would continue to provide foraging and post-fledgling habitat. Much of this (@68%) consisted of partial harvest activities that maintained an average of 50% canopy closure and portions of the acreage affected by these treatments would provide canopy closure conditions conducive to nesting. While future timber harvest on non-federal lands will reduce suitable goshawk nesting habitat, suitable goshawk nesting habitat will be continue to be restricted primarily due to the overstocked, dense stand conditions that characterize much of the project area. Additionally suitable and capable habitat on NFS lands will remain relatively unchanged under this alternative and these areas will continue to provide suitable as well as potential nest habitat.

Current activities such as firewood collection, road maintenance, dispersed recreation, collection of special forest products (e.g. Christmas trees & wreaths) and previously approved noxious weed treatment along road corridors will continue to occur. However

much of this will be concentrated along open roads, many of which already have year-long access. As a result, the level of disturbance is not expected to increase and potential disturbance to goshawks would be minor. It is also anticipated that there would be occasional wildfire suppression and should it occur, this would be a source of short-term disturbance. There has also been some residential development in the last 3-5 years within the project area and some additional development is expected in the future. Current levels of human activity in these areas are also expected to continue, although due to the proximity to open roads and existing development, potential impacts would be minor.

Although suitable nesting, foraging and post-fledgling habitat will be available under this alternative, the overstocked stand conditions that presently limit suitable nest habitat will continue. As a result and considering the increased hazards associated with future wildfire, it is expected that goshawk habitat will be reduced under this alternative.

Effects Determination for Alternative 1

While there is expected to be a reduction of habitat under this alternative due to the continued high density stand conditions that will exist, unless there is a large stand replacing wildfire, any habitat changes will be gradual and will occur over several decades. Also because goshawks have a large home range and can successfully move to alternate nest sites and suitable habitat, ***Alternative 1 may impact individual goshawks or their habitat, but would not cause a local or regional change in habitat quality or population status***.

Alternative 2

Direct and Indirect Effects – Although there are no old growth areas affected, treatments proposed under Alternative 2 would affect 194 acres that are validated as suitable goshawk habitat. Of this, 106 acres would receive a commercial thinning/sanitation salvage treatment, 54 acres would be harvested with a group selection/commercial thinning and 34 acres would receive an irregular shelterwood treatment. Treated areas are unlikely to retain sufficient overstory canopy cover to remain as suitable nesting habitat in the short term (5 to 10 years). However approximately 50% canopy closure will continue to occur on sites receiving a thinning or group selection harvest treatment and these stands (82% of suitable habitat treated) will continue to provide suitable foraging and post-fledgling habitat (Samson 2006) during this period. Also available foraging/post-fledgling habitat will continue to be widespread and occur within all affected watersheds. Additionally, although empirical data is lacking, Reynolds et al. (1992 *In* Samson 2006) and Graham et al. (1997 *In* Samson 2006) have also suggested that the use of controlled fire and thinning may improve habitat by creating favorable conditions for goshawks and their prey (i.e., promoting diameter growth in overstory trees, creating open understories or downed wood). Finally due to increased canopy closure, it is likely that suitable habitat affected by partial harvest treatments will again provide suitable nesting habitat conditions within 5 to 10 years (Moser and Garton, 2004 In Samson 2006) and a long-term loss of suitable nesting habitat is only expected to occur on 34 acres.

Approximately 426 acres of unsuitable habitat would also be treated under this alternative. Because many of these stands are characterized by forest health concerns, the incidences of disease and insect outbreaks have affected their capacity to maintain sufficient structure and contribute to future habitat suitability. Of this unsuitable habitat, 321 acres would receive a commercial thinning/sanitation salvage, group selection or free selection treatment. Although there will be no loss of nesting habitat on this acreage, because these treatments will create more open stand conditions and maintain an average of 50% canopy closure, it is expected that within 10-15 years, many of these sites may provide suitable nesting habitat conditions.

While there will be a reduction in suitable habitat under this alternative, silvicultural prescriptions would be designed to retain large-diameter live trees, which can be managed for future snag recruitment and an emphasis would be placed on the retention of large snags. These design features as well as retaining and promoting hardwood trees would ultimately improve habitat conditions for goshawk on some sites (Samson 2006). Finally because future overstory mortality would be reduced, moving these stands to more disease-resistant species would be expected to help stabilize future nesting habitat

Other than changes in habitat, proposed management activities including logging, road re-construction and maintenance, temporary road construction and burning can result in short term disturbance. Although there are currently no known active nests, goshawks utilizing the area for foraging could be adversely affected by the noise and human presence associated with these activities. These impacts would be short in duration and have minimal impacts to goshawks or their habitat. In addition, if any goshawk nests were established during project implementation, the following mitigation measures would be implemented; 1) A no-activity buffer (greater than 150 foot radius) would be placed around each known active nest tree 2) a 40-acre buffer would be placed around each nest area to provide long-term nesting habitat, and 3) purchaser operations and related Forest Service activities would be suspended within 0.5 miles from active nest areas from March 15 to August 15 to promote nesting success and provide foraging opportunities for adults and fledgling goshawks during fledgling-dependency period. Activity restrictions would be removed after June 30 if the Forest Service determines the nest site is inactive or unsuccessful. Collectively these project design features would help ensure the nest site and post-fledgling area received minimal disturbance and reduce the likelihood that there would be a reduction in nest site productivity.

In summary, while timber harvest in suitable habitat would make measurable reductions in fuel loading and reduce the possibility for stand-replacing fire in the future, proposed regeneration cutting under Alternative 2 will result in a long-term reduction of suitable habitat on 34 acres. In addition, there will be a short-term reduction in canopy closure on another 160 acres of suitable habitat. Although almost 50% of the project area would continue to provide suitable and capable goshawk habitat and over the long-term, proposed actions would lead to long-term stability of habitat for northern goshawks by promoting and maintaining a more open forest structure (300 acres) than exists today. Finally, with implementation of project design features, there will be no anticipated loss of future goshawk nest productivity.

While implementation of Alternative 2 will result in a reduction of goshawk habitat, it will also provide for the long-term enhancement of flammulated owl habitat. Northern goshawks have proven to be somewhat flexible in their choice of nest stands on the District, occasionally utilizing stands with inferior structural conditions (Brett Lyndaker personal communication). Also, new goshawk territories are being discovered on the District nearly every year. In the last five years, at least seven new territories have been documented, four of which are known to have produced young in 2006 ("d7goshawk.xls" – project file). Conversely, flammulated owls are uncommon locally with relatively small amounts of suitable habitat remaining. Therefore, it seems prudent to tilt the management of stands capable of providing habitat for species in favor of flammulated owls – particularly in light of the evidence that these stands historically were maintained in an open-grown condition that more closely approximated flammulated owl habitat.

Cumulative Effects – Approximately 50% of the project area has been affected by past timber harvest. While some stands would have lost or are losing sufficient forest structure to achieve habitat suitability, some proposed treatments may improve the long-term stability of habitat for northern goshawks by promoting and maintaining a more open forest structure (Samson 2006). In general, due to the large reduction in canopy, timber harvest that involved regeneration logging or overstory removal result in a long-term reduction in goshawk nesting habitat, while sales that involved salvage or thinning from below preserved habitat, by maintaining canopy closure conditions that would be conducive to nesting (Samson 2006). Cumulatively by 2027, past timber harvest activities will have affected goshawk habitat on an estimated 65-70% of the project area However approximately, 1150 acres of this (65% of total) consisted of partial harvest activities that would provide suitable nesting habitat within 5-10 years of harvest. As a result and considering suitable and/or capable nesting habitat will continue to exist on 50% of the project area, that suitable foraging and post-fledgling habitat will continue to be well distributed across the project area and considering design features are in place to minimize the risks to future nesting goshawks, it is not anticipated that timber harvest and prescribed burning proposed under Alternative 2 will not significantly affect the northern goshawk or its habitat.

Firewood cutting is anticipated to continue along seasonally and yearlong open roads. This activity may be disruptive to northern goshawks nesting in the area, as they are particularly sensitive to disturbance during the courtship and nesting periods. However, since existing use occurs along open roads, it is not anticipated that the level of disturbance will increase. Because most harvest occurs within 50 meters of an open road, it is also unlikely that personal use firewood cutting would make habitat modifications that could impact goshawks, Similarly due to their proximity to roads, recreation activities, routine road maintenance and noxious weed control are are also unlikely to adversely affect goshawk use. Although off-road recreational use during the spring and early summer may disturb nesting goshawks to some degree.

Other than treatments proposed under Alternative 2, there is no additional scheduled timber harvest anticipated. However in the event that incidental residual tree mortality

occurs as a result of windstorms, ice damage, fire or insects and disease, some salvage harvest may occur in the treatment units and associated roadsides. Although existing roads, landings and skid trails will be used and all treatments would adhere to site specific design criteria, including protection of goshawk nest sites (identified above). There may also be some collection of special products from pre-commercial thinning sites, although use would be localized and short term (<1 season) and result in minimal impacts to goshawks.

Continued fire suppression has mixed effects on northern goshawks. While suppression efforts may protect currently suitable nest stands from stand-replacing fire, this activity has also contributed to the understory congestion of dry-site stands that have reduced suitable goshawk habitat in recent years. Although Alternative 2 treatments will reduce suitable goshawk nesting habitat, over the long-term (>25 years), proposed treatments would create more stable, diverse forest habitat that is less prone to stand-replacement fire and may create more desirable goshawk nesting habitat on the more moist sites. Treatment would also help to facilitate restoration of historic goshawk habitat conditions.

As described above, a goshawks home range can exceed 6000 acres. In order to determine if there is adequate habitat at a larger landscape, a GIS analysis was done on a collection of 6th order watersheds that includes the Twin Skin project area. This larger area totaled approximately 33,000 acres of private and National Forest System lands in the Deer Cr., Lower Moyie River and Kootenai River watersheds. Goshawk habitat was assessed based on recommendations by Reynolds et al (1992), which included maintaining the following Vegetation Structural Stage (VSS) proportions within goshawk home ranges; 10% each in VSS 1 (grass/forb/shrub) and VSS 2 (seedling/sapling) and 20% each in VSS3 (young forest), VSS 4 (mid-aged forest), VSS 5 (mature forest) and VSS 6 (old forest). The following is a summary of the existing goshawk habitat within this area; presently 7% of the area occurs as non-forested openings (VSS1), 13% exists as seedling/sapling stands (VSS2), approximately 11% is in the pole structural class (VSS3) and currently approximately 65% of the area is dominated by forested stands containing a predominance of sawtimber (VSS 4 & VSS5) Although the old growth structural conditions that characterize VSS6 cannot be determined at this scale, approximately 3% of the area contains late successional stands between 150 and 273 years of age and it is likely many of these stands would provide some of the structural conditions that characterize VSS6. Reynolds et al (1992) recommend that collectively VSS 3, 4 and 5 should make up 60% of a home range. Although there is currently a lack of old growth (VSS 6) and disproportionate amount of immature medium (VSS 4) habitat, VSS 3, VSS 4 and VSS 5 combined, exceed recommended levels both currently and in the future. Also habitat will be available to meet recommendations by Reynolds (1992), that within a goshawks home range (@5000 aces), adequate habitat should be provided to support three suitable and three replacement nest sites.

Because implementation of Alternative 2, will only result in a long-term reduction of suitable nesting habitat on 34 acres and considering the availability of suitable nesting, foraging and post-fledgling habitat across affected watersheds, suitable goshawk nesting habitat will continue to be available and it is not anticipated that the level of harvest

proposed will result in significant effects to this species or its habitat. The availability of suitable habitat within the watersheds affected by the Twin Skin project is also consistent with a recent review of the availability of goshawk habitat in the Northern Region (R1) (USDA 2007). The key findings of this review indicate that goshawk habitat in R1 is abundant, well distributed and that there is more habitat available today, then occurred historically. A comparison of habitat estimates for maintaining viable populations also indicates, that given the natural distribution of habitat, each Forest in R1 has an excess of available goshawk habitat.

Effects Determination for Alternative 2

While implementation of Alternative 2 will reduce suitable goshawk habitat, suitable and capable goshawk habitat will continue to be available. Also there is no known goshawk nesting within the project area and design criteria are in place to protect new nests. The northern goshawk was removed from the Forest Service Region 1 sensitive species list in July 2007, largely because a 2005 conservation assessment and inventory, demonstrated that: (1) habitat exists to support reproductive individuals on each Forest in Region 1; (2) habitat is well-distributed; and (3) individual goshawks can interact with one another across the Region. More recently, the Northern Region overview for the Northern Goshawk provided the following key findings related to the goshawk and its habitat (USDA 2007):

- Goshawk habitat in R1 is abundant and well distributed where it occurs naturally, and more forest, and therefore nesting habitat, exists on today's landscape than what occurred historically.
- There have been substantial increases in connectivity for forested habitat since Euro-American settlement.
- The level of timber harvest of the forested landscape in R1 is insignificant.
- No demographic information exists to suggest a decline in goshawk numbers.
- Not a single known nest site in R1 is isolated from other known nests by more than the goshawks' estimated dispersal distance.
- A comparison of habitat estimates for maintaining viable populations indicates that given the natural distribution of habitat, each Forest in R1 has an excess of available goshawk habitat.

In summary, although goshawk habitat will be reduced under Alternative 2, based on the analysis presented above, particularly the continued availability of suitable habitat within the project area, Forest and Region, and considering project design features are in place to protect nests and minimize impacts to nesting goshawks, implementation of this alternative ***may cause temporary reductions in northern goshawk nesting habitat at a local level, but would not likely indicate a local or regional change in habitat quality or population status.***

Consistency with Forest Plan and Other Regulations

Due to the maintenance of nesting, foraging and post-fledgling habitat and considering there is no anticipated reduction in nest productivity, the proposed activities would not alter viable populations of northern goshawks. As a result, both alternatives comply with Forest Plan direction to prevent further declines in populations, which could lead to

Federal listing under the Endangered Species Act (USDA Forest Service 1987 p. II-28). Also because neither alternative will reduce old growth, both alternatives are consistent with Forest Plan old growth objectives (USDA Forest Service 1987, p. II-5). In addition, all alternatives are also consistent with National Forest Management Act requirements to provide for a diversity of animal communities (16 USC 1604((g)(3)(B)).

Pileated Woodpecker

Existing Condition

Pileated woodpeckers are year-round residents preferring forests with tall, large-diameter dead or defective trees for nesting. This species was selected as a MIS because its highest densities occur in old-growth forests and because it needs large dead trees for nesting and dead woody material (standing and down) for foraging (Bull et al. 1990). Nesting habitat for pileated woodpeckers in the northern Rocky Mountains most commonly occurs in forest stands with live or dead western larch, Douglas-fir, ponderosa pine, and black cottonwoods greater than 18 inches in diameter with moderate canopy cover. New nest cavities are excavated each year in stands of 50 to 100 continuous acres, generally below 5,000 feet in elevation with basal areas of 100 to 125 square feet per acre and a relatively closed canopy (Aney and McClelland 1990). Nest trees typically are large diameter, dead trees at least 30 feet high (Bull 1989). Dead trees are preferred over live trees for nesting and roosting, and nest trees are usually over 25 inches in diameter in stands with at least 60 percent canopy cover (Bull et al. 1990; Bull and Holthausen 1993). Snag abundance and large-diameter trees are critical components of pileated woodpecker habitat.

Pileated woodpeckers feed primarily on carpenter ants and other insects excavated from deep within dead and decaying wood (Bull 1989; Aney and McClelland 1990). Most foraging occurs in logs and dead trees at least 6 inches in diameter, although large diameter (greater than 12 inches) dead wood is used most frequently (Bull et al. 1990). Pileated woodpeckers use a wider variety of forest conditions for foraging than for nesting, so the availability of nesting habitat is considered a limiting factor for the species.

Since the 1930s, much of the project area has become dominated by 80- to 90-year-old trees. Consequently, there are a small to moderate number of mature forest pockets and a limited number of large-diameter snags. White pine blister rust has also eliminated many large trees and fire exclusion has created stands with smaller and younger size classes. Therefore, snag production is shifting from larger, longer-lived species to smaller, shorter-lived species, reducing habitat quality for pileated woodpeckers and other snag-dependent species. Although it is likely that past timber harvest has also removed some of the large trees, thereby reducing snag availability and nesting, over 800 acres or 28% of the project area consist of stands whose structure is dominated by mature/large diameter or old growth trees. As a result, these stands are more likely to contain the larger diameter trees that would provide potential pileated woodpecker nesting habitat. Also field surveys indicate that some stands contain pockets of large diameter trees and

based on recent and old pileated woodpecker sign, foraging habitat has been documented across much of the project area.

Environmental Consequences

Methodology

Potential effects on pileated woodpecker and other snag-dependent species were determined by estimating the change and distribution of quality snag habitat that could result from the implementation of the alternatives, using TSMRS, Forest health and FIA data

Analysis Area

Pileated woodpeckers territories range between 800 and 1500 acres (Samson 2006) and the project area will be of adequate size to evaluate the direct, indirect, and cumulative effects to this species.

Alternative 1

Direct and Indirect Effects - Alternative 1 would result in no direct impacts to pileated woodpeckers; however, there would be indirect effects to habitat. There would be a continued shift in species composition toward more shade tolerant species in the majority of the stands. This change would trend stands toward a smaller size class and younger age class of trees. Consequently, snag production would shift away from the larger, longer-lived species, affecting the long-term stability and persistence of large snag habitat in the Twin Skin project area. Alternative 1 would not result in an immediate change in snags or suitable habitat. Although some large snags will continue to be present supporting low population levels of this species, habitat would continue to decline. Stands would continue to decline in health and vigor and would become increasingly crowded with immature trees. This would increase the likelihood that wildfire would alter stand structure, reduce canopy closure, and ultimately reduce suitable habitat.

Cumulative Effects – Potential cumulative effects include timber harvest, insect and disease related tree mortality, fire suppression and firewood collection. Although there is no additional timber harvest scheduled on NFS lands, since the early 1970's, it is estimated approximately 50% of the lands within the project area have received some form of timber harvest. Although snag retention and snag recruitment (leaving higher densities of green trees for future snags) have recently improved in harvested areas through implementation of Forest Plan standards and, more recently, by adoption of the Northern Region Snag Protocol (USDA 2000), virtually all of this past timber harvest prior to 1987 would have reduced large diameter snag densities on this area. Although large snags currently occur in very low numbers within the project area, a component of large snags would have been maintained on NFS lands that have been treated since 1987 (1300 acres or 71% of the NFS harvest during the analysis period).

Due to its requirement for large snags, Firewood cutting is anticipated to continue along seasonal and yearlong open roads. This activity reduces snags within 50 meters of open

roads. However, because most of the project area (78%) occurs beyond 50 meters from an open road, most existing habitat would be unaffected.

Effects Determination for Alternative 1

Although there may be some minor loss of snags suitable for pileated woodpecker nesting, there will be no significant reduction in nesting habitat and suitable foraging habitat will continue to be available across the project area. As a result and considering the increased hazards from future wildfire, ***Alternative 1 may impact individual pileated woodpeckers or their habitat, but would not cause a local or regional change in habitat quality or population status***.

Alternative 2

Direct and Indirect Effects - The proposed action (timber harvest, temporary road construction & burning) would treat a total of 718 acres of potential nesting and foraging habitat, including 51 acres of regeneration harvest treatments and five acres associated with new road construction that would result in a long-term loss of nesting habitat. Additionally in the event that incidental residual tree mortality occurs as a result of windstorms, ice damage, fire or insects and disease, some salvage harvest may occur in the treatment units and associated roadsides. Although project design criteria to retain snags would be implemented during these activities, it is possible some additional loss of habitat may occur. There would also be a short-term reduction in canopy cover on sites receiving a partial harvest treatment (>90% of timber harvest sites), although because an average of 50% crown closure will be maintained on the site, canopy closure suitable for nesting would be restored within 10 to 15 years. Although up to 23% of the project area will be affected, timber harvest would generally focus on smaller diameter stems of shade tolerant species, while impacts to large diameter snags and snag recruitment trees – particularly ponderosa pine and larch – would be reduced. Foraging habitat would also remain to some extent in all treatment areas.

A reduction in snag densities through timber harvest and subsequent burning may reduce nesting habitat over the short-term, although design features requiring snag retention and protection of veteran and relic survivor trees whenever possible would reduce these impacts. Also harvest prescriptions are designed to generally provide for long-term maintenance of species such as white pine, ponderosa pine, and western larch. As a result, project implementation would improve pileated woodpecker nesting habitat within the project area in the long term (>50 years), by providing conditions that will promote development of large diameter snags. Also no allocated old growth or stands having old growth characteristics would be affected by the proposal and this project incorporates design features that maintain where available, a large snag component within harvest units and promote retention of future large, long-lived snags.

Forest Inventory and Analysis (FIA) data demonstrate that forested USFS lands on the Bonners Ferry/Kootenai Geographic Area contain an estimated 9.9 snags/acre (90% confidence interval) between 10” and 19.9” dbh (USDA 2006). In addition, annual aerial surveys of new insect-induced tree mortality across the Bonners Ferry Ranger District conducted by USFS Forest Health Protection personnel have shown that bark beetles

infested an average of almost 4,000 acres per year from 1990-1998 across the District, and the level of new infestation increased to over 20,000 acres from 1999-2000 (S. Kegley, pers. com.). This higher rate of infestation and mortality is expected to continue for the next few years due to increasing mountain pine beetle, western balsam bark beetle and fir engraver populations, especially if drier than normal weather conditions continue (USDA-FS 2007a). So while the proposed actions would reduce the quantity of available snag habitat, outside of treatment areas (77% of the project area), tree mortality would continue to persist and foraging habitat, and where it exists nesting habitat, would continue to be available in these areas.

Cumulative Effects - Cumulative effects include any activity that reduces large diameter snags for nesting and canopy cover. Like Alternative 1 past timber harvest on non-federal lands would have reduced snag densities in logged stands in nearly every instance, as would have harvest on NFS lands prior to 1987. The long-term impact of these activities was the reduction of snags of all sizes. In subsequent years, snag retention and snag recruitment (leaving higher densities of green trees for future snags) in harvested areas has improved through implementation of Forest Plan standards and, more recently, adoption of the Northern Region Snag Protocol (USDA 2000). In general, activities that involved regeneration logging or overstory removal reduced pileated woodpecker habitat, while partial harvest that involved thinning from below would have improved habitat within 10 to 15 years following treatment. While tree mortality in untreated stands has increased Forest-wide, the majority of affected trees are in smaller size classes. To date it is estimated that approximately 50% of the project area has had some level of timber harvest and of this approximately 22% (@1000 acres) has been some form of regeneration harvest. With implementation of Alternative 2, up to approximately 70% of the area will have received some form of harvest.

Forest succession and fire suppression have and continue to impact pileated woodpecker habitat within the project area. The lack of fire and increased fuels and shifts to small diameter shade tolerant tree species has also altered the species composition and structure from that of historic conditions. Over the long term, treatments proposed under this alternative would help to restore vegetative conditions, including development of larger diameter trees and more desirable pileated woodpecker habitat on sites treated, whereas development of smaller diameter trees would continue on untreated stands.

Other than treatments proposed under Alternative 2, there is no additional scheduled timber harvest anticipated. Although there is expected to be some further loss of snags and habitat due to future firewood collection and timber harvest on private lands. Cumulatively these impacts are not be expected to reduce viability because firewood collection would occur on only a small portion of the project area (within 50m of open roads) and because adequate habitat would continue to be available on NFS lands.

While Alternative 2 will reduce pileated woodpecker habitat on up to 23% of the project area, implementation of design criteria to retain large diameter snags and reduce short term impacts, combined with anticipated long-term development of future large diameter snag habitat and considering the continued availability of existing large diameter snags in

untreated areas (USDA 2006), it is anticipated that adequate habitat will continue to be available to support existing populations of this species.

Effects Determination Alternative 2

Although there will be a reduction in habitat under this alternative, adequate nesting and foraging habitat will continue to be available and treatments will promote the development of future large diameter snag habitat. Additionally Samson (2006) concluded that short-term viability of the pileated woodpecker in the Northern Region is not an issue because; 1) No scientific evidence exists that the pileated woodpecker is decreasing in numbers, 2) Increases in the extent and connectivity of forested habitat have occurred since European settlement, 3) Well-distributed and abundant pileated woodpecker habitat exists on today's landscape and 4) The level of timber harvest in the Northern Region is insignificant. As a result, Alternative 2 ***may impact individual pileated woodpeckers and their habitat, but would not indicate a local or regional change in habitat quality or population status.***

Consistency with Forest Plan and Other Regulations

Suitable nesting and foraging habitat will continue to be available under both alternatives. Additionally, based on the FIA snag analysis information, including the widespread availability of suitable snags, both alternatives are consistent with Forest Plan goals and objectives for managing snag habitat (USDA-FS 1987, Appendix X). Also because neither alternative will affect exsting old growth and considering implementation of Alternative 2 is expected to result in the long-term development of large diameter snags and trees characteristic of old growth habitat, both alternatives are consistent with Forest Plan old growth objectives (USDA Forest Service 1987, p. II-5). In addition, because there will be no reduction in viability for this species, both alternatives are also consistent Forest Plan goals and objectives to maintain viable populations of vertebrate species (wildlife report section II-1) and with National Forest Management Act requirements to provide for a diversity of animal communities (16 USC 1604((g)(3)(B)).

White-tailed Deer

Existing Condition

Traditionally associated with a mixture of seral stages of vegetation, white-tailed deer are well distributed throughout the Idaho Panhandle National Forests. Climatic factors affect the seasonal variation of forage quality and quantity, accessibility to foraging areas and the thermal requirements of the animal. Winter range is the most critical feature of their habitat with winter being the most stressful period for big game because of the harsh weather conditions and limited food supply. During winter, animals are forced by increasing snow depths to travel downslope and concentrate on smaller, restricted winter ranges. Conversely, during summer, deer use a broader elevational range of habitats.

During winter, white-tailed deer are generally found on the valley bottoms and lower benches. Dense tree cover is probably the most important component of critical winter range. As winter temperatures decrease and snow depths increase, animals select habitats to minimize energy expenditure and maintain a positive energy balance. Closed-canopy

stands reduce the animals' heat loss and intercept snow, reducing understory snow accumulation and increasing foraging opportunities.

The project area is within the elevation and habitat type range of critical winter range (moderately dry Douglas-fir or grand fir, moist grand fir, western red cedar, and western hemlock with dense cover, occurring below 3,000 feet elevation). Approximately 50% of the project area occurs in MA's 3 and 4, which include objectives to manage to provide forage for big game winter range. Adjacent private land provides a mix of forest cover, varying from seedling and sapling stands to mixed-age, open-canopy stands.

Currently 50% of the project area is considered capable white-tail deer habitat, including 212 acres on dry sites, and 1289 acres on moist habitats. Historically, dry sites provided only modest thermal cover values due to more frequent fire regimes that maintained conditions that are more open. Due to decades of fire suppression, tree densities have increased, creating stand conditions that are more closed. While these areas can provide favorable winter structure for white-tailed deer, they are not sustainable due to their predisposition to insects, disease, and other ecological pressures. Of the capable deer habitat, approximately 900 acres or 29% of the project area occur as sawtimber sized stands that are be more likely to provide necessary thermal cover conditions.
Deer populations in this game management unit are considered high (IDFG 2006) and numerous observations and abundant sign was observed throughout much of the project area during field reviews.

Environmental Consequences

Methodology

Effects on white-tailed were determined by predicting the changes to winter range for the alternatives. Critical winter range is the most limiting aspect of white-tailed deer habitat. Key components of critical winter range are stands that consist of medium to larger trees with at least 60 percent canopy cover (thermal cover), which is the amount of cover needed to ameliorate heat loss and energy expenditure during severe winter periods. Habitat suitability was derived from the Forest TSMRS database in conjunction with 2005 and 2007 field review notes (located in the project file, vegetation section).

Analysis Area

Since 50% of the project area occurs in management areas whose direction includes providing desired conditions for big game, the project area contains adequate winter range and was used to assess direct, indirect, and cumulative effects to white-tailed deer. The analysis period starts when recent timber harvest on NFS lands began (@1970) and runs through 2018, which is the time when all timber harvest and burning would be expected to be completed.

Alternative 1

Direct and Indirect Effects – Because there are no activities proposed, there will be no direct effects to white-tail deer under this alternative. However in the absence of

mechanical treatments, habitat conditions would change. There would be a continued shift toward more shade tolerant species, and small diameter trees and understory congestion would continue to build up in most stands. Insects, disease and competition for sunlight and nutrients would hasten tree mortality and trigger increases in down woody material. As a result cover conditions would be improved. Conversely, the closed canopy conditions that will be resulting under this alternative will decrease available herbaceous and shrubby vegetation and early spring and winter forage. Long-term effects would be similar to Alternative 2 except that changes would occur over a longer period.

Cumulative Effects - Past and future activities that could contribute to cumulative effects include timber harvest on private lands and NFS lands, residential development, and dispersed recreation, including hunting. While there will be some decrease in cover and increase in forage on private lands due to future timber harvest, because this alternative does not propose any activities that will maintain past and present levels of big game forage on NFS lands, it is anticipated that available big game forage will be reduced under this alternative within the next 10 years. If there are no natural disturbances that increase light to the forest floor, over the long-term there will be a reduction in herbaceous and woody vegetation and implementation of Alternative 1 will reduce available big game forage.

Hunting does occur in the project area and populations of deer are managed by Idaho Fish and Game through licensed hunting. Hunting levels are set based on population levels. Within deer analysis unit 1, which includes the Twin Skin project area, white-tailed deer population numbers have increased in recent years and hunter success is high (IDFG 2006). Because changes in habitat will be gradual, effects to deer and deer hunting will be relatively unchanged under this alternative.

Current activities such as firewood collection, road maintenance, dispersed recreation, collection of special forest products (e.g Christmas trees & wreaths) and noxious weed treatment along road corridors will continue to occur. However much of this will be concentrated along open roads, many of which already have year-long access. As a result, the level of disturbance is not expected to increase and potential disturbance to deer would be minor.

There has been some residential development in the last 3-5 years within the project area and some additional development is expected in the future. Current levels of human activity in these areas are also expected to continue, although due to the proximity to year-round open roads, potential disturbance to deer would be minor.

Stands would continue to decline in health and vigor and would become increasingly crowded with immature trees. This would result in increasing hazards from future wildfire that could alter stand structure and reduce canopy closure, which would reduce suitable habitat.

Effects Determination Alternative 1

Although there will be some increases in available cover, because implementation of this alternative will result in localized reductions in forage for big game and increase hazards associated with future wildfire and possible long-term loss of habitat, implementation of this alternative, ***may impact individual white-tailed deer and/or their habitat, but would not indicate a local or regional change in habitat quality or population status***.

Alternative 2

Direct and Indirect Effects - Although approximately 600 acres of capable habitat would be treated by timber harvest, only seven acres of currently suitable winter range would be affected by the proposed action. A total of 51 acres of the capable acreage affected will receive harvest associated with a regeneration treatment and the remaining acreage will be affected by commercial partial harvest treatments or a pre-commercial thinning. Additionally, in the event that incidental residual tree mortality occurs as a result of windstorms, ice damage, fire or insects and disease, some additional salvage harvest may occur in the treatment units and associated roadsides. Although existing roads, landings and skid trails will be used and all treatments and there would be no change in the acreage affected.

Although timber harvest would reduce thermal cover and may increase vulnerability to hunting pressure through increased sight distances from the road, it would also help ensure that high quality forage is available. Also as trees receiving a partial harvest treatment within the treated stands are released from competition with dense understory trees, canopy cover would recover and when this occurs, the stand would provide improved winter range conditions. As a result, sites proposed for thinning, free selection and group selection (92% of proposed harvest) will provide both future thermal cover and increased levels of forage. Some logging may occur during the winter months and while logging during winter can disturb wintering animals, disturbance would be short term in nature and deer would be expected to habituate to proposed activities and utilize material felled. As a result and considering there will be no permanent road construction or changes in access, disturbance related effects would be minor.

During the most critical times of the winter, such as times of extremely cold temperatures and deep snow, foraging becomes almost secondary to the use of cover areas. These areas are generally characterized by a mature forested stand with a dense canopy, which serves several functions. The main function of the mature trees with their larger branches in the crown is to intercept a larger proportion of the snow, resulting in reduced snow depths on the ground. A second function of the denser crown is to act as a thermal blanket, trapping warmer air in the stand. The overall result is a warmer area with reduced snow depths, which in turn leads to less energy expenditure and more energy conservation. Implementation of Alternative 2 would help develop the type of stand structure that is important to wintering deer, while reduce the possible loss of habitat from future wildfire. Prescribed burning would help improve vigor and nutrient content of forage for ungulates. Forage production in treatment units has been limited by the proliferation of shade-tolerant tree species and a slight increase in tall, less palatable

shrub species. By opening up the stands to increased sunlight and prescribed burning, the proposed action would improve the quality of white tail deer habitat within the project area by enhancing production of forage species. In addition, the maintenance and enhancement of hardwoods would improve the diversity of habitat available.

The proposed temporary road construction would remove some big game habitat. However, only 5 acres would be affected. Also forage would be restored on the site when the temporary road is obliterated and lands affected restored. Other activities including continued road maintenance, and possible future salvage in the event of a natural disturbance will only result in short-term disturbances and/or changes in habitat.

Other proposed management activities that could adversely affect deer include burning, road maintenance, disturbances associated with logging, invasive weed treatments and possible salvage in the event of a natural disturbance. The main impacts would be the noise, equipment, and human presence associated with the above activities. Although these activities may cause big game utilizing the immediate area to leave temporarily, avoidance would be of short duration and have minimal impacts to white-tailed deer or their habitat. Invasive plant treatments would improve habitat conditions for white-tailed deer by reducing competition with desired native species. Other than the short-term disturbance, treatment activities for invasive plants and post-harvest salvage of blowdown would have negligible impact to white-tailed deer.
While there will be changes in the distribution of cover and forage that result under this alternative, over 92% of existing suitable habitat and 60% of existing capable habitat will be unaffected by treatment. As a result, adequate thermal cover will continue to be available.

Cumulative Effects - Activities that could contribute to cumulative effects include past and future timber harvest, hunting, residential development, road construction, and recreational activities. Timber harvest on NFS lands and activities on adjacent private lands have modified big game use patterns and winter range through removal of cover and by increasing forage, both of which can result in localized changes in habitat and deer numbers. Cumulatively by 2018, it is estimated that up to 70% of the analysis area has been affected by timber harvest. In some areas, residential development has also diminished availability of winter range adjacent to the project area. Hunting is expected to continue and hunter numbers and harvest will continue to be regulated by the Idaho Fish and Game through licensed hunting. Hunting levels are set based on population levels. Although there may be some changes in harvest and hunter numbers, considering that the state has recently increased harvest in this unit in an effort to reduce current numbers, local changes in habitat will not significantly alter or reduce populations.

Other than treatments proposed under Alternative 2, there is no additional scheduled timber harvest anticipated. However, there may also be some collection of special produces from pre-commercial thinning sites, which would result in additional short-term behavioral avoidance during harvest and a continued loss of cover on any units treated.

During implementation of project activities, white-tailed deer could be impacted by the combined actions of Alternative 2 and activities on private such as logging and new home construction. Overall treatments would increase deer forage and decrease cover on up to 30% of the project area. Local reductions in white-tailed deer may result from ongoing activities within the project area. However due to the continued availability of suitable habitat, project related effects are not expected to be significant.

Effects Determination for Alternative 2

Based on the above analysis and considering that 92% of existing suitable habitat will be unaffected, that white tail deer winter range will continue to be available, that available forage will increase and considering the increasing deer population in the area, ***Alternative 2 may impact individual white-tailed deer and/or their habitat, but changes would not indicate a local or regional change in habitat quality or population status***.

Consistency with Forest Plan and Other Regulations

Forage would be provided on both summer and winter range and available white-tailed deer critical winter range would continue to be available (USDA FS 1987 II-6). As a result, both alternatives comply with the Forest Plan regarding big game management and the maintenance of species viability. For these same reasons, both alternatives are also consistent with NFMA (16 USC, 1604, 6(g) (2) (B)), which requires that the Forest Service provide a diversity of plant and animal communities in the Plan area.

Forest Land Birds

Existing Condition

Neotropical migrant birds and resident songbirds are a diverse group of birds not addressed separately by species. Approximately 240 species of birds inhabit the Idaho Panhandle and collectively they utilize a wide variety of habitat conditions ranging from early to late successional forest conditions. Vegetation structure is important in determining habitat use by forest birds and can greatly affect bird diversity. Similarly, the diversity or mix of different habitats across the landscape also affects the diversity and abundance of forest dwelling birds. Bird communities change as vegetation changes and any treatment, including no action, will alter the bird community. Idaho Partners in Flight has identified and prioritized four habitats that represent species of moderate to high vulnerability, and species with declining or uncertain population trends. These prioritized habitats include riparian habitat, non-riverine wetlands, sagebrush shrub, and dry ponderosa pine/Douglas-fir/grand fir forests (Idaho Partners in Flight 2000). The Twin Skin project area contains the dry ponderosa pine/Douglas-fir/grand fir forest type, scattered non-riverine wetlands and riparian habitat.

Of the 243 bird species breeding in Idaho, 31 use the dry ponderosa pine/Douglas-fir/grand fir as nesting habitat, including two high priority species (IPIF 2000). This community is also considered important habitat for management, because the dry ponderosa pine/Douglas-fir/grand fir forest in Idaho represents a significant component of this forest type worldwide and because it has declined in both quantity and quality (Idaho PIF 2000).

Hejl (1994) identified the following principles to help maintain habitat and healthy forests for a variety of bird species:

- encourage old-growth characteristics
- leave snags and replacement trees
- leave or plant the natural diversity of trees found in the area
- burn and allow fires to happen in a manner similar to natural fire regimes
- mimic natural landscape patterns

While no single forest condition or structural type will benefit all species, providing a mosaic of habitat conditions and age classes will help to maintain bird species diversity and abundance.

Environmental Consequences

Methodology

Bird species differ in their habitat requirements and responses to management activities. Due to the large number of species that can occur in a forested landscape, it is impractical and nearly impossible to take a species-by-species approach. Rather, this analysis looks at the avian community as a whole, in the context with the surrounding landscape. It addresses priority habitats identified by Idaho Partners in Flight (2000) and discusses how management activities, or even a lack of management activities, can affect bird species composition and richness.

Analysis Area

The direct, indirect, and cumulative effects analysis area is defined as the project area. Many forest land birds have relatively small home ranges and the project area is of adequate size to evaluate the impacts on these species. Also as described above, habitats that occur within the project area are representative of the surrounding landscape.

Alternative 1

Direct and Indirect Effects - Because there are no actions proposed, there would be no direct effects to forest land birds under this alternative. Indirect effects or changes in habitat would be expected however. As current trends continue, stands would decline in health and vigor, and become increasingly crowded with immature trees. The diversity of habitat conditions across the landscape would also decline, as existing seedling, sapling and pole stands mature. This trend would result in decreased vegetative diversity and, ultimately, decreased habitat for some forest birds. Conversely, habitat would be improved for species that require large blocks of predominately mature forest. There would also be a continued decline in dry ponderosa pine/Douglas fir/grand fir forest conditions and with continued fire suppression, fuels and the possibility for a severe stand replacing wildfire would increase, resulting in a change in forest land bird habitat.

Cumulative Effects - Past activities that have occurred within National Forest System lands include timber harvest, fire suppression, road development, firewood collection and recreation. Because these activities have altered vegetation communities and structure, they have also altered habitat for land birds. Forest succession and fire suppression would continue to impact land bird habitat within the project area by influencing the ecology, species composition and forest structure. Also in the absence of naturally occurring disturbances, it would be expected that the diversity of habitats and ultimately songbird diversity would decrease. Although the abundance of species that prefer the structure provided by small diameter trees with little understory development may increase. However any changes in habitat would be gradual and there would not be expected to result in a significant impact to land birds or their habitat.

Determination for Alternative 1

There will be no direct impacts under this alternative. However because implementation of Alternative 1 will result in increased hazards from wildfire and potential adverse effects to land birds and their habitat, including a continued reduction in the dry Douglas fir/grand fir/ponderosa pine forest type, ***Alternative 1 may impact individual forestland birds and habitat, but would not contribute to a local or regional change in habitat quality or population status.***

Alternative 2

Direct and Indirect Effects – A total of 718 acres of habitat will be affected under Alternative 2 (includes temporary road construction). Effects to birds and their habitat vary by the type of treatment. A total of 662 acres will receive a partial harvest activity including thinning/salvage, group selection harvest, free selection or pre-commercial thinning. Direct effects to birds from these types of treatments are generally short-term in nature and may involve some direct mortality during logging, if cutting occurs during the breeding season. While cutting may result in avoidance of the site by some species sensitive to disturbance, because of the increase in browse and cover provided by increased levels of slash, other species of birds are attracted to logging sites. Although partial harvests maintain a mature overstory, they do alter stand structure and understory conditions and treatment is expected to improve songbird forage and cover conditions for some species on the site. While even-aged partial harvest treatments will result in some changes in stand structure, since mature forest conditions will continue to occur following treatment, wildlife diversity on these sites is not expected to be significantly altered.

As with partial harvest activities, effects from regeneration treatments (See Table 3) include some direct mortality if cutting occurs during the breeding season. However while partial harvest treatments result in relatively minor changes in bird use, regeneration treatments can result in a much more dramatic change and some mature forest songbirds may be displaced for up to 50 years, until a predominantly mature canopy is re-established. The reduction in overstory trees also results in a tremendous increase in herbaceous vegetation and tree seedlings and this flush of understory vegetation provides habitat for early-successional species, as well as mature-forest species which also utilize seedling/sapling habitat.

Due to increases in herbaceous and woody vegetation, final harvest treatments are expected to favor early successional species over species that prefer or require mature forest conditions. Although species diversity is not expected to decrease, there will be a short term increase in the abundance of early successional species on the site. This increase in early successional species is considered temporary, because within 10-15 years, early successional habitat conditions and early successional wildlife would be expected to decline, as they are replaced by bird species that prefer the structural conditions provided by sapling/pole stand. Additionally, due to the retention of reserve and wildlife trees, it is anticipated that many mature forest wildlife will continue to use the site following the regeneration harvest.

Bird diversity is greatly affected by structural conditions that exist across the landscape and Table 6 displays the present forested structural conditions that exist within the project area, as well as the anticipated conditions that would exist following implementation of Alternative 2. As can be seen from Table 6, although there will be a small increase in seedling/sapling habitat and subsequent decrease in sawtimber, there will continue to be a diverse assemblage of habitats available under Alternative 2. Also the sawtimber size class will continue to predominate across the landscape. As a result, although there may be minor shifts in bird use, there will be little change in the availability of habitat and proposed timber harvest is not expected to significantly affect bird diversity or abundance.

Table 6: Alternative Changes in structural classes

Size Class	Present Condition		Alternative 2	
	Acres	%	Acres	%
Seedling	297	9.5	314	10.0
Sapling	242	7.7	242	7.7
Pole	227	7.2	227	7.2
Small sawtimber	1464	46.7	1450	46.3
Large Sawtimber	813	26.0	805	25.7
Old Growth	68	2.2	68	2.2

Temporary disturbance from underburning, tree removal, and road construction would cause short-term direct impacts to forest land birds. Effects of burning on the bird community can vary over time and burning usually does not affect bird communities through habitat changes for several years (White et al 1999). Bendell (1974) summarized a number of studies of effects of burning on birds. He concluded that overall, the number of species of birds increased after burning and that the number of species that fed on or near the ground increased the most, as might be expected with the increase in grasses, herbs and shrubs following burning. Effects of burning on wildlife also vary depending on the season of the burn. Proposed burning is considered a dormant season burn, which

produce low-growing, sprouting regeneration of shrubs and trees and stimulate the production of soft mast (Stansky and Rose 1984). These responses may provide forage, cover and arthropod prey for many songbird species (Dickson 1981).

Indirect effects of proposed burning include modifications or changes in conditions on the affected sites. In the short term, effects on vegetation from burning include maintaining relatively open understory conditions and development of herbaceous and woody vegetation. While vertical stand structure may be temporarily reduced on sites proposed for treatment, burning is expected to increase overall plant species diversity on the site, as well as create more complex understory conditions than presently exist, both of which would be expected to enhance bird species diversity and abundance.

Although the project area contains scattered wetlands, these areas are protected through avoidance and project design criteria. Due to fire suppression and declining health and vigor, dry ponderosa pine/Douglas-fir/grand fir forest habitats are declining. One of the objectives of Alternative 2 is to promote the restoration of this forest community and encourage the long-term stability of dry habitats by altering species composition and treating overcrowded conditions of shade-tolerant trees. Such restoration would increase the vegetative and habitat diversity for forest land birds and help restore this declining forest community.

Riparian and streamside habitats, as well as ground vegetation associated with wetlands, are particularly important and provide habitat for a variety of birds. Also these are considered priority communities which warrant protection (Idaho Partners in Flight 2000). This was a consideration during project layout and there will be no treatments within 100 meters of any streams. Similarly, BMP's are also in place that will provide for the protection of all existing wetlands and these important communities will not be adversely affected under this alternative.

The proposed temporary road construction would remove some forested bird habitat (up to five acres). However, due to the small acreage involved, there will only be short term direct effects and virtually no indirect effects to habitat. The temporary road would also be obliterated after treatment and this would help to reduce impacts to species sensitive to disturbance.

Since many of the proposed treatments would occur during the breeding season, effects could include possible direct mortality of less-mobile individuals, including migratory bird nests and/or eggs. While habitat for migratory birds may be affected by proposed activities, implementation of Forest Plan standards and guidelines, project level design features and protection of riparian and wetland habitats, would reduce effects to these priority habitats and help to ensure that suitable habitat conditions for bird species that presently utilize the project area would continue to be available. Finally, the Forest Service is a partner in the North American Bird Conservation Initiative (NABCI) and in compliance with Executive Order 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds.

Cumulative Effects - The effects of past timber harvest have changed over the years. Early timber harvests usually targeted the largest trees, which in most instances were ponderosa pine, and to a much lesser extent Douglas-fir and western larch. This form of harvest, coupled with fire suppression, has allowed smaller, shade-tolerant, late-successional species such as Douglas-fir to become established and open stands of old growth trees with dense stands of young trees. This had changed the habitat available to birds associated with the open stands found under a historical understory fire regime (Idaho PIF 2000).

Historic fires, fire suppression, and logging have also resulted in more homogenous tree species composition and structure, thereby decreasing forest land bird diversity. Because the implementation of Alternative 2 would ultimately improve forest land bird habitat by maintaining vegetative diversity and restoring dry ponderosa pine/Douglas-fir/grand fir forests, benefits would outweigh short-term impacts associated with disturbance and/or shifts in habitat availability.

Other than treatments proposed under Alternative 2, there is no additional scheduled timber harvest anticipated, although there may also be some collection of special products from pre-commercial thinning sites. However the total acres entered by treatment will not change and effects to the bird community are expected to be minor. Current activities such as firewood collection, dispersed recreation and occasional noxious weed treatment along road corridors will continue and may be a short-term, localized, minor source, of disturbance and habitat modification.

Determination for Alternative 2

Proposed treatments will result in some direct impacts and habitat modification to landbirds. However based on the above analysis, particularly given that 1) suitable habitat will continue to be available for all bird species that presently use the project area, 2) that many effects are short term in nature, 3) that riparian and wetland habitat will be protected and 4) that treatments will maintain or improve priority habitats, ***Alternative 2 may impact individual forestland birds and their habitat, but would not contribute to a local or regional change in habitat quality or population status.***

Consistency with Forest Plan and Other Regulations

While the Forest Plan does not address specific standards or guidelines for managing forest land birds, it does provide guidance for managing snag habitat and old growth and requires that habitat be provided to maintain viable populations of all vertebrate species. This project would continue to provide a diversity of habitat conditions across the landscape, meet or exceed Forest Plan standards for snag management, maintain species viability and would not adversely impact inventoried old growth stands. The proposed activities would not impact viable populations of forest songbirds and both alternatives are consistent with NFMA (16 USC, 1604, 6(g)(2)(B)), which require that the Forest Service provide a diversity of plant and animal communities in the Plan area.

Summary of Effects

The Forest Plan and the NFMA require that fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species. The project would treat approximately 713 acres of National Forest land and the analysis presented above discusses the changes in wildlife habitat conditions that would occur under each of the alternatives considered. Potential effects at the landscape and site or stand scale were evaluated. Although wildlife distribution and use may shift as preferred habitats either become available or are lost, based on the analysis provided, effects to the wildlife resource are not expected to be significant. Additionally, available habitat for wildlife that presently use the project area would continue to be available and viable populations of local wildlife will be maintained. Also due to avoidance during project layout, implementation of project level design features and protection of riparian and wetland habitat, priority wildlife habitats will be maintained. As a result, anticipated impacts will not be great enough to decrease populations of any species.

Table 7 summarizes effects determinations for the species considered for analysis in the Twin Skin HFRA Project.

Table 7. Determinations of effects for species at risk

Species	Alternative 1	Alternative 2
Grizzly Bear (threatened)	May Affect, Not Likely to Adversely Affect	May Affect, Not Likely to Adversely Affect
Canada Lynx (threatened)	No Effect	No Effect
Gray Wolf (threatened)	May Affect, Not Likely to Adversely Affect	May Affect, Not Likely to Adversely Affect
Woodland Caribou (endangered)	No Effect	No Effect
Bald Eagle (sensitive)	No Impact	No Impact
Black-backed Woodpecker (sensitive)	May impact individuals or habitat, but will not contribute to a trend towards Federal listing, cause a loss of viability or a reduction in local or regional populations.	May impact individuals or habitat, but will not contribute to a trend towards Federal listing, cause a loss of viability or a reduction in local or regional populations.
Black Swift (sensitive)	No Impact	No Impact
Coeur d'Alene Salamander (sensitive)	No Impact	No Impact
Western Toad (sensitive)	May impact individuals or habitat, but will not contribute to a trend towards Federal listing, cause a loss of viability or a reduction in local or regional populations.	May impact individuals or habitat, but will not contribute to a trend towards Federal listing, cause a loss of viability or a reduction in local or regional populations.
Fisher (sensitive)	May impact individuals or habitat, but will not contribute to a trend towards Federal listing, cause a loss of viability or a reduction in local or regional populations.	May impact individuals or habitat, but will not contribute to a trend towards Federal listing, cause a loss of viability or a reduction in local or regional populations.
Harlequin Duck (sensitive)	No Impact	No Impact

Species	Alternative 1	Alternative 2
Flammulated Owl (sensitive)	May impact individuals or habitat, but will not contribute to a trend towards Federal listing, cause a loss of viability or a reduction in local or regional populations.	May impact individuals or habitat, but will not contribute to a trend towards Federal listing, cause a loss of viability or a reduction in local or regional populations.
Pygmy Nuthatch (sensitive)	May impact individuals or habitat, but will not contribute to a trend towards Federal listing, cause a loss of viability or a reduction in local or regional populations.	May impact individuals or habitat, but will not contribute to a trend towards Federal listing, cause a loss of viability or a reduction in local or regional populations.
Fringed Myotis (sensitive)	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species
Northern Bog Lemming (sensitive)	No Impact	No Impact
Peregrine Falcon (sensitive)	No Impact	No Impact
Common Loon (sensitive)	No Impact	No Impact
Townsend's Big-eared Bat (sensitive)	No impact	No Impact
Wolverine (sensitive)	No Impact	No Impact
Northern Goshawk (MIS)	May impact individuals and habitat, but would not likely indicate a local or regional change in habitat quality or population status	May impact individuals and habitat, but would not likely indicate a local or regional change in habitat quality or population status
Pileated Woodpecker (MIS)	May impact individuals and habitat, but would not likely indicate a local or regional change in habitat quality or population status	May impact individuals and habitat, but would not indicate a local or regional change in habitat quality or population status
Marten (MIS)	May impact individuals and habitat, but would not likely indicate a local or regional change in habitat quality or population status	May impact individuals and habitat, but would not likely indicate a local or regional change in habitat quality or population status
White-tail Deer (MIS)	May impact individuals and habitat, but would not indicate a local or regional change in habitat quality or population status	May impact individuals and habitat, but would not indicate a local or regional change in habitat quality or population status
Forest Land Birds	May impact individuals and habitat, but would not indicate a local or regional change in habitat quality or population status	May impact individuals and habitat, but would not indicate a local or regional change in habitat quality or population status

Design Features and Monitoring

The following measures were included in the consideration of effects discussed above and should be included as design features of the proposed action:

1. **Road Design:** To retain habitat for snag-dependent species and species dependent on large-diameter trees, the location of the proposed temporary road would ensure,

whenever practical, that veteran and relic survivor trees and snags would not be removed during construction.

Estimated Effectiveness: **Low to Moderate;** road location is determined to a large degree by FS road construction standards and the local terrain near the site to be accessed. Cost reduction is also an important consideration. It is likely that some veteran and relic survivor trees would be removed when locating new roads.

2. Skid Trail and Cable Corridor Location: To maintain habitat for snag-dependent species, the timber sale or contract administrator would ensure, whenever practical, that the design of skid trails and cable corridors would avoid veteran and relic fire survivor trees and snags.

Estimated Effectiveness: **Moderate;** the sale administrator has authority under timber sale contract provisions to approve all skid trail and cable corridor locations. However, there are many practical considerations in choosing these locations. Avoiding individual desirable trees is only one of those considerations. It cannot be expected that all veteran and relic trees would be protected by this measure.

3. Road Management: The temporary road would be fully obliterated following use in accordance with the Area Road Management Plans and the IPNF Forest Plan. Existing roads, which are currently restricted and utilized for this project, would be returned to their pre-project road status.

Estimated Effectiveness: **High;** this is part of the proposed action and would be implemented under the sale contract. Closing the roads will provide both habitat and security for wildlife.

4. Wildlife Tree and Down Log Retention: Snag and coarse down wood management objectives for the project would be patterned after historical conditions for vegetative communities, recognizing that the existing density and distribution of snags vary across the landscape and that current conditions may not make it possible to immediately meet these objectives for some areas (e.g., long-term fire suppression that interrupted natural snag recruitment, and past timber harvesting).

5. Snags and Live Tree Replacements: Will be retained where opportunities exist in treatment units at levels recommended or exceeding recent studies and scientific literature (Bull et al. 1997). Where possible, this project will strive to exceed the minimum Regional Snag Management Protocol for snag and live tree replacements within treatment units. Where they exist, the following minimum amounts of snags and live tree replacements will be retained within cutting areas:

Dry forest habitats: 4-6 snags/acre and 8 live tree replacements/acre from the largest representative trees.

Moist forest habitats: 6-12 snags/acre and 12 live tree replacements/acre from the largest representative trees.

Estimated Effectiveness: **Moderate/High;** this measure would be implemented using project layout, contract provisions, compliance monitoring and fuels treatment, and would have a moderate chance of avoiding and/or reducing adverse effects on snag dependent wildlife. It would not be the intent of this project to willfully remove the high hazard snags and snags in the advanced stages of decay ("soft" snags). Some of these "soft" snags would survive and remain standing during the life of the project.

Past monitoring has demonstrated that tree harvesting and subsequent burning removes a large portion of existing snags, especially the "soft snags." However, through the strategic placement of leave patches or clumps, snags within these areas should be relatively protected. In addition, prescribed underburning will recruit "new" snags by fire-killing residual green trees. There would be no problem meeting and exceeding live tree replacement criteria because vegetative prescriptions are designed to leave ample green trees scattered in patches and individually (regeneration cutting), and uniformly (selective cutting) across treatment areas. Consequently, this measure should provide more than the minimum number of snags and live tree replacements.

6. Snag Selection: Selection of snags will emphasize practices that assure a diversity of snag structural classes and the highest probability for long-term retention. High-hazard snags and snags in the advanced stages of decay will not be used to meet retention objectives. Snag retention practices will give emphasis to larger diameter ponderosa pine, western larch, western red cedar, and western white pine available within each treatment unit. When these snags are not available, Douglas fir, hemlock, and grand fir will be used. Veteran or relic ponderosa pine and western larch snags will be top priority for retention. Trees killed by root disease will be avoided, where possible, to meet retention objectives because of their rapid deteriorate/fall-down rate. The minimum retention snag will be 10 inches dbh.

Estimated Effectiveness: **High;** this is a standard method used to help field crews identify appropriate trees to leave for wildlife habitat needs. It has been used successfully for many years.

7. Maintaining Habitat for Snag-dependent Species: To maintain habitat for snag-dependent species, the tree-marking guide will assure a diversity of snag structural classes and the highest probability for long-term retention. An emphasis will be placed on retention of the largest snags. Where necessary, an un-harvested perimeter will be left around large, relic, fire-burned trees and/or snags to protect them from harvest operations.

Estimated Effectiveness: **High;** this is a standard method used to help field crews identify appropriate trees to leave for wildlife habitat needs. It has been used successfully for many years.

8. Snag Retention Objectives: While some snag retention objectives are accounted for on a treatment level scale, some snags will be represented on every 10 acres of treatment,

in clusters or clumps where feasible, to promote good distribution of snags. Large-diameter snags felled for safety reasons would remain onsite to provide for large woody debris recruitment and long-term site productivity. The exception would be where these snags would exceed Forest Plan standards for down wood tonnage adjacent to private property. Retention snags will be left in areas that are not easily assessable from FS roads or directly adjacent to private property, whenever possible. This would increase the likelihood the snags would not be removed for firewood and would remain on the landscape.

Estimated Effectiveness: **High;** this measure is accomplished during the layout phase of project implementation. Identification and clumping of snag retention areas is commonplace in the layout and design of timber sales today.

9. Snag Recruitment: Silvicultural prescriptions would be designed to retain large-diameter, live trees, which may be managed for future snag recruitment and retention. Large-diameter live trees (except those posing safety concerns and infected or at-risk Douglas-fir), would be retained whenever possible. Large-diameter trees that are felled for safety concerns would be left on the ground, unless they are within approximately 150 feet of an accessible road and would likely be taken for firewood. In this case, they could be removed by the operator. Large down logs in excess of minimum down wood guidelines adjacent to privately owned land would also be removed. In grapple-pile treatment units, the large-diameter logs would be left in place.

Estimated Effectiveness: **High;** using silvicultural prescriptions, marking guides, and compliance monitoring, this feature would have a high likelihood of retaining large-diameter trees and down logs.

10. Maintaining Veteran and Relic Structure: No old-growth stands exist within the project area. However, to maintain habitat for snag-dependent species, areas within treatment units that contain small pockets of older, large diameter structure will be thinned from below or not treated. These unique areas will be managed on a case-by-case basis. Vegetation type, moisture regime, logging system, wildlife species suitability and surrounding treatments will all be considered.

Estimated Effectiveness: **High;** this measure has a high likelihood of protecting these areas. Implementation depends on accurate identification of these areas by the marking crew in the field. Some areas may not be identified; however, retention of the largest trees is part of the marking guide.

11. Protection of Cedar Swales: Microsites of western red cedar having diameters greater than 12 inches dbh will be retained.

Estimated Effectiveness: **High;** this measure has a high likelihood of being implemented using contract provisions and compliance monitoring.

12. Retention of Hardwood Trees: To maintain forest species diversity and wildlife habitat, aspen and birch trees will not be harvested for pulp. If trees of these species need

to be cut for safety reasons, they will remain on site for coarse woody debris and long-term site productivity. Conifers in and around aspen and birch patches will be harvested or slashed to reduce competition for water, sunlight, nutrients as well as to help provide fuel for underburning. Where appropriate, individual trees may be cut or pushed over to encourage sprouting. Whenever possible, these areas will be underburned to stimulate sprouting. This strategy will provide vegetative diversity, which benefits various wildlife species.

Estimated Effectiveness: **High;** this measure has a high potential for being implemented. These measures would be implemented through contract provisions and compliance monitoring. Effectiveness is high because regardless of whether hardwood trees remain standing or felled for safety reasons, they remain onsite and provide benefits to various wildlife species. Hardwoods, such as aspen and birch, will re-sprout if felled or killed by burning.

13. Grapple Piling: Where grapple piling occurs, leave an average of one to three slash piles per acre unburned for small forest mammals and land birds.

Estimated Effectiveness: **Moderate;** this measure would have a high likelihood of providing suitable habitat for small mammals and birds and has become fairly standard practice. The success of being implemented depends on the communication for this measure to field crews implementing the burning of the piles 1 to 2 years following completion of the timber sale. Considering the time between piling and burning, there is some risk that the measure will not be implemented.

14. Goshawk Nest Site Protection: If a goshawk nest were discovered, mitigation measures would be implemented to help ensure that nest sites and post-fledgling areas are receiving minimal disturbance. A no-activity buffer (greater than 150 foot radius) would be placed around each known active nest tree. In addition, a 40-acre buffer would be placed around each nest area to provide long-term nesting habitat (Reynolds et al. 1992).

Purchasers operations and related Forest Service activities would be suspended within 0.5 mile distance of active nest areas from March 15 to August 15 to (1) promote nesting success and (2) provide foraging opportunities for adults and fledgling goshawks during fledgling-dependency period. Activity restrictions would be removed after June 30 if the Forest Service determines the nest site is inactive or unsuccessful.

Estimated Effectiveness: **High;** using contract provisions, this feature would have a high likelihood of achieving the desired objectives.

15. Threatened, Endangered, and Sensitive Wildlife Species Protection:
<u>Gray wolf</u>

- Any gray wolf den or rendezvous sites identified in or adjacent to proposed activity areas will be spatially and/or temporally buffered as appropriate. This would include:

- No project activities within one (1) mile of occupied sites from April 1-July 1 for den sites and from July 1-August 15 for rendezvous sites. Upon review by the Forest Level 1 team, these distances could decrease based on topographical characteristics at each site.

- Due to their proximity to recent wolf sightings, all timber harvest in the Solomon Lake Units (Units 16-18) will be restricted from April 1 through August 15.

Grizzly bear

- In order to minimize disturbance to grizzly bears during project implementation, all timber harvest in units 16-18, will take place outside the spring bear season (April 1 to June 15).

- All road reconstruction and road maintenance activities that take place within the Keno BMU will occur outside the spring bear season (April 1 to June 15).

- Roads 2549 UH and 2549UE will be made impassable to public traffic during and after implementation of the Twin Skin project.

All listed species

- If any threatened, endangered, or sensitive species are located during project layout or implementation, management activities would be altered, if necessary, so that proper protection measures can be taken. Timber sale contract provisions that require the protection of Threatened, Endangered and Sensitive Species would be included in the timber sale contract.

Estimated Effectiveness: **High;** using contract provisions, these features would have a high likelihood of achieving the desired objectives.

Prepared by: _____
Date:_____
Scott L. Reitz
TEAMS Wildlife Biologist

Reviewed by:_____ Date:_____

Brett R. Lyndaker
North Zone Wildlife Biologist

Twin Skin HFRA Project
Wildlife Species Not Analyzed in Detail

In order to determine the scope of analysis and identify which species need to be analyzed in detail, a preliminary assessment for each species was done in order to determine the availability of suitable habitat or likelihood of presence in or near the project area and to assess risk, or the potential for each species to be adversely affected by activities proposed in the Twin Skin HFRA EA. Based on this preliminary analysis, the following species were NOT considered relevant to the Twin Skin HFRA project.

Sensitive Species

Bald Eagle

Bald eagles are winter visitors and yearlong residents of northern Idaho. They are attracted to the area's larger lakes and rivers, which provide most of their foraging opportunities (e.g. fish, waterfowl). Accordingly, bald eagles select isolated shoreline areas with larger trees to pursue such activities as nesting, feeding, loafing, etc. Nesting habitat usually includes dominant trees that are in close proximity to a sufficient food supply and within line-of-sight of a large body of water (usually within ¼ mile). Nest trees typically are large ponderosa pine, Douglas-fir, western larch or cottonwood trees with open crowns in areas that are relatively free from human disturbance (Montana Bald Eagle Working Group 1991).

During migration and at wintering sites, eagles tend to concentrate on locally abundant food and tend to roost communally. Roost sites are usually located in stands of mature or old growth conifers that provide protection from inclement weather.

Reference Condition: The Bonners Ferry Ranger District is included in Zone 7 as designated in the Pacific States Bald Eagle Recovery Plan (USDI 1986). At the time of federal listing, bald eagles were uncommon in this zone. Since then, recovery areas in northern Idaho have contributed enough new territories to reach and exceed goals listed in the Recovery Plan. Originally, there was a target of zero territories in the area covered by the Bonners Ferry RD. In Boundary County alone, there are now at least 12 active or historic territories, most of them discovered in the last decade. The majority of these nests are along the Kootenai River, outside of National Forest System lands.

Protection and enhancement of bald eagle habitat revolves around securing and maintaining the areas around the following: (1) nest site (¼ mile radius around nest tree); (2) primary use area – where 75% of eagle activity is concentrated (i.e. foraging, loafing, bathing – ½ mile radius); (3) home range – includes all suitable foraging areas within 2.5 mile of nest site; and (4) winter communal roosts (<10 acres in size that contains ≥6 bald eagles on given night) (USDI 1986).

Existing Condition: As of early 2005, there were two active bald eagle nests on the Kootenai National Wildlife Refuge. However, both of these nests are over 2 miles from the project area.

Rationale for No Further Analysis: There will be no habitat alteration within two miles of any known bald eagle nest. Since all timber harvest would take place in upland habitats, there will be no impacts to suitable foraging areas. As a result, the Twin Skin HFRA project would have ***no impact*** on bald eagles or their habitat and no further analysis and discussion is warranted.

American Peregrine Falcon

Peregrine falcons are seasonal migrants, nesting in the northern temperate regions while wintering in the tropics and subtropics. They nest on sheer cliffs with overhanging ledges or potholes and a vertical surface that are typically higher than 100 feet and provide protection from predation. Foraging areas associated with nest sites can include wooded areas, riparian habitats, marshes and open water.

Reference Condition: Peregrine falcons once ranged throughout the northern Rocky Mountains but suffered serious population declines, largely due to pesticide contamination. By 1975, peregrines had been extirpated from Idaho. In 1982, the Peregrine Fund, in cooperation with other agencies and organizations, began a recovery effort to reintroduce peregrines into Idaho. From 1990 to 1995 the Forest Service and the Peregrine Fund worked together to release young peregrines into the wild. This effort was considered a success in 1997 when a pair of falcons returned to the area and established a nesting territory near its historic eyrie. This was the first evidence of breeding in North Idaho in several decades.

Existing Condition: In August 1999, the peregrine falcon was removed from the Endangered Species list. Previously, the only known eyrie (nest site) associated with the northern (Kaniksu) portion of the Idaho Panhandle National Forests was located in the Clark Fork River Valley, some 50 air miles southeast of the project area. Records of peregrines within Boundary County had been rare, but documented in the spring on the Kootenai National Wildlife Refuge. However, in June, 2006, the Kootenai Tribe of Idaho Fish & Wildlife Department located a peregrine falcon eyrie on the cliffs along the Kootenai River east of Bonners Ferry, Idaho. Subsequent visits documented the presence of two adults and a single fledgling at this site (S. Soults, pers. com.). The eyrie is on

private property, but is directly across the Kootenai River from an isolated parcel of USFS-administered land.

Rationale for No Further Analysis: There are no suitable cliffs or known eyries in close proximity to the project area and proposed treatment sites. Because of the lack of suitable nesting habitat, the Twin Skin HFRA project would have ***no impact*** on peregrine falcons or their habitat and no further analysis and discussion is necessary.

Common Loon

Common loons generally nest in clear, fish-bearing lakes surrounded by forest, with rocky shorelines, bays, islands, and floating bogs (McIntyre and Barr 1997). The species constructs ground nests on islands, floating bog islets, or other protected areas. Because of their need for large expanses of water for take off and landing, loons generally occur in lakes larger than 10 acres in size (USDA Forest Service 1989). The primary threats to loons are shoreline developments and recreational activities (i.e. boating, jet skiing) that interrupt nesting. Also, on some of the larger lakes such as Priest Lake and Lake Pend Oreille, these birds are extremely sensitive to human disturbance.

Reference Condition: Anecdotal evidence suggests, at least from a historical perspective, that common loons nested in northern Idaho. In 1985 a statewide effort was conducted to document loon distribution in Idaho (Fitch and Trost 1985). Lakes investigated were chosen using guidelines on size and elevation of lakes, water depth and clarity and nest and nursery habitat requirements. During this survey, the only successful nest discovered was at Indian Lake, south the Yellowstone Park, where one chick was fledged (however, nine-tenths of this lake resides in Wyoming). While there was no direct evidence of nesting in northern Idaho, loons were observed on several lakes including Robinson and Kerr lakes in Boundary County. Since this study shoreline development and the amount of boating traffic have increased dramatically on most North Idaho lakes with public access.

Existing Condition: A habitat assessment during the summer of 2004 (Savoy 2004) identified six lakes within Boundary County that may provide common loon breeding sites (Perkins, Bonner, Brush, Smith, Dawson, and Robinson lakes). While single loons and occasionally pairs have been sighted on all but Smith Lake, no successful nesting has been documented on any of these lakes.

Rationale for No Further Analysis: There are no lakes or bodies of water below 5,000 feet elevation that are large enough to support loons in the project area. Therefore, the Twin Skin HFRA project would have ***no impact*** on the common loon and no further analysis and discussion is necessary.

Harlequin Duck

Harlequin ducks are rare, seasonal residents of whitewater streams in the northern Rockies. They are small sea ducks that winter in coastal areas and migrate hundreds of miles inland to northern Idaho, western Wyoming and western Montana to breed and rear young. Harlequins nest along clear, clean, swiftly flowing remote mountain streams located away from concentrated human activities. Harlequins arrive in northern Idaho between March and May. After nesting begins in mid-May the males migrate back to the Pacific coast. Nesting continues through July, with the females rearing the young through late August or September, after which they return to the coast for the winter (Cassirer and Groves 1991).

The presence of harlequin ducks is considered an indicator of high water quality (USDA 1992). Management activities that impact stream quality, including those that could increase water yield beyond the stream's capability, have the potential to impact this species. Water quality standards relative to harlequins are primarily to protect their invertebrate food base and maintain hydrologic function. Harlequin ducks can also be affected by disturbance within approximately 200 feet (depending on density of streamside vegetation) of a nesting stream.

Reference Condition: The estimated breeding population of harlequin ducks in Idaho includes a total of 70 breeding pairs (Cassirer et al. 1996). Harlequin ducks were listed as a C2 candidate in 1991 by the U.S. Fish and Wildlife Service due to low numbers, limited distribution, and localized population declines.

Existing Condition: Harlequin duck staging and breeding habitats are concentrated in the Purcells and northern Selkirk zones on the Bonners Ferry RD. In northern Idaho, breeding streams are usually associated with mature to old growth western red cedar/western hemlock or spruce/fir forest stands (Cassirer and Groves 1991). Nesting habitat includes very low gradient stream sections with braided channels, intact riparian areas with dense streamside shrub growth, and rich aquatic insect populations (Cassirer and Groves 1991). Turbulent stream sections are used for security and feeding. The closest documentation of the harlequin duck is approximately 2 miles northwest of the project area along the Moyie river.

Rationale for No Further Analysis: There are no documented sightings of harlequin ducks in the Twin Skin project area, although it is possible that breeding habitat exists in along the Moyie River, Deer Creek or Skin Creek. However, all proposed cutting units are located well away from (>100 meters) these tributaries. As a result, there will be no modifications to riparian (nesting) habitat; and disturbance to breeding or nesting ducks, since all activity will be in excess of two sight distances from the stream (Cassirer et al. 1996). As a result, the Twin Skin HFRA project would have ***no impact*** on harlequin ducks or their habitat and no further analysis and discussion is necessary.

Northern Bog Lemming

Northern bog lemmings are found in sphagnum bogs, wet meadows, moist mixed and coniferous forests, alpine sedge meadows, krummholz spruce-fir forests with dense herbaceous and mossy understory, and mossy streamsides (Streubel 2000). They feed on grasses and other herbaceous vegetation. They are active day and night throughout the year. They occupy surface runways and burrow systems up to 12 inches deep. They can be found in small colonies with population densities that may reach 36 individuals per acre. (Streubel 2000). Northern bog lemmings feed on grasses, sedges, and other herbaceous vegetation, but also snails, slugs, and other invertebrates (Foresman 2001). Nearly all of the documented occurrences of northern bog lemmings in Idaho, Montana and Washington have been found in peatlands characterized by extreme abiotic conditions that inhibit the decay of organic materials, allowing the soil to hold large quantities of water and maintain a relatively stable environment for plant and animal species.

Reference Condition: 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. They are listed by the Idaho Department of Fish and Game as a Species of Concern, and in 1999 were added to the USFS Region 1 Sensitive Species list.

Existing Condition: Alpine wet meadows and fen/bog habitat is generally limited to a few locations on the Bonners Ferry Ranger District. A single northern bog lemming was trapped in a boggy meadow in Cow Creek in the Selkirks in 1988. Surveys for this species in likely habitat at Grass Creek and Perkins Lake during summer, 2004 did not produce any individuals (Boggs and Wood 2004). The largest threats to this species are activities that would dry out or damage the vegetation (trampling, compaction etc.). These activities could include timber harvest, livestock grazing or recreation use.

Rationale for No Further Analysis: Since there is no wet meadow habitat in the project area and there are no treatment sites within 300 ft. of any streams, it is very unlikely that bog lemmings would occur in or near sites proposed for treatment. Therefore, the Twin Skin HFRA project would have ***no impact*** on the northern bog lemming and no further analysis and discussion is necessary.

North American Wolverine

Wolverines are low density, wide-ranging species that inhabit remote forested areas, ranging over a variety of habitats. Wolverines tend to use lower elevations in the winter and higher elevations in summer, when these areas provide the greatest potential for a food supply (Hornocker and Hash 1981). Wolverines are primarily scavengers but will also hunt small mammals. Denning habitat is high elevation snowy cirque basins.

Wolverine mortality associated with human/wolverine interactions is considered one of the primary limiting factors in wolverine populations. Improved access increases the

potential for these conflicts, which can lead to shooting loss or incidental take by trapping (wolverines are occasionally taken by trappers focusing on other furbearers such as bobcat and American marten). Other factors with the potential to threaten local population viability of the species include reductions of "wilderness refugia" (large areas of habitat with limited human access) or food availability (Butts 1992).

Reference Condition: Wolverines are considered scarce or rare in north Idaho, however, the actual status and range remains uncertain. The scarcity of information is largely due to the difficulty and expense in studying an animal that is solitary and secretive, and found mostly in remote areas at low densities.

Existing Condition: The project area includes primarily lower elevation winter range and there are no confirmed observations of wolverines in the project area, although several wolverine sightings have been reported on the Bonners Ferry RD in recent years. While wolverines may utilize proposed harvest units, they are likely to be transient due to their wide-ranging nature.

Rationale for No Further Analysis: Wolverines require large, remote areas to roam and feed. The project area is characterized by open and restricted roads and less than 15% of the area is beyond ¼ mile of an open road. While the project area provides foraging opportunities for wolverine, little if any preferred secure habitat occurs within the area. As a result, potential den sites would not be affected and considering human access would not be increased and that there would be no measurable changes in the forage base, there would be ***no impact*** to wolverine or their habitat and no further analysis and discussion is necessary.

Townsend's Big-eared Bat

Townsend's big-eared bats are primarily cave dwelling species. Although they occur in a wide variety of habitats, distribution tends to be correlated with the availability of caves, especially old mine workings (Pierson et al. 1999). Their behavior appears, in most cases, to be temperature driven with bats using cooler sites before the young are born and moving to warmer sites after the young are born. In spring and summer, females form maternity colonies in warm parts of caves, mines and buildings. In winter, they prefer relatively cool places for hibernation, often near entrances and in well-ventilated parts of caves and mines (Kunz and Martin 1982).

Reference Condition: Townsend's big-eared bats occur throughout much of the western North America, from British Columbia to Mexico, and eastward to Texas (Pierson et al. 1999). Throughout much of their range they are recognized as species at risk. They are currently listed as a R-1 Sensitive Species and considered species of special concern by most western states' wildlife management agencies. Records of Townsend's are found throughout the State of Idaho.

The most serious factor leading to population declines is loss and/or disturbance of suitable roosting habitat. Most notable threats include abandoned mine closures, recreational caving, and renewed mining at historical sites (Pierson et al. 1999). As the Forest Service closes more mines with bat-accessible gates, human disturbance will decrease and habitat will be improved for this species and other bats which roost in abandoned mines.

Existing Condition: Townsend's big-eared bats have been documented at only two sites on the Bonners Ferry Ranger District: the American Girl and Bethlehem mines. Neither of these sites are in the project area and there is little mining activity in the Deer or Skin Creek drainages.

Rationale for No Further Analysis: Since Townsend's big-eared bats have not been documented in the project area and the presence of roosting habitat or hibernacula is unlikely, the Twin Skin HFRA project would have ***no impact*** on the Townsend's big-eared bat and no further analysis and discussion is necessary.

Coeur d'Alene Salamander

Coeur d'Alene salamanders are small salamanders that choose seeps and wet sites, usually with rock that contains deep fissures that enable them to moderate their temperature by avoiding outside air. Known populations occur in association with fractured rock formations often found in the Belt rock formations. They have been found in three types of select habitats: seeps and springs, waterfall spray zones, and stream edges (Groves et al. 1996). Coeur d'Alene salamanders are usually found above ground at night during moist weather in the spring and fall and retreat into the narrow spaces between fractured rocks to avoid drying out in the summer and freezing in the winter.

Reference Condition: Although they likely were once widely distributed in the northern Rocky Mountains, Coeur d'Alene salamanders currently maintain a disjunct distribution limited to isolated populations in northern Idaho, northwestern Montana, and southeastern British Columbia. Because of its limited range and specific habitat association, this species has been listed as a sensitive species by Region 1 of the USFS, and is also a state Species of Special Concern in Idaho and Montana.

Existing Condition: Coeur d'Alene salamanders are found in scattered locations through the Idaho Panhandle National Forests. This species occurs on Bonners Ferry Ranger District on the east side, but has not been recorded in the Selkirks (Groves 1988). Groves (1988) suggested that the absence of salamanders in seemingly suitable waterfall habitat in the Selkirk Mountains was due to a lack of fractured rock into which they can retreat in winter to avoid freezing. Where they have been investigated, Coeur d'Alene salamanders have been found to be locally abundant but limited to appropriate microhabitats within their range.

Rationale for No Further Analysis: There are no documented observations of Coeur d'Alene salamanders within the project area. Considering there are no treatments within 300 ft. of any stream, there will be no impacts to the stream channel, hydrology or riparian vegetation. Therefore, the Twin Skin HFRA project would have ***no impact*** on the Coeur d'Alene salamander and no further analysis and discussion is necessary.

MANAGEMENT INDICATOR SPECIES

American Marten

The marten is a solitary carnivore that inhabits mature stands of coniferous forest throughout North America. In the western United States, marten are most abundant in mature to old growth true fir or spruce-fir forests and generally avoid open, drier coniferous forests (Warren 1990). They prefer forest stands greater than 40 percent tree canopy closure that protects them from predators and enhances the moist conditions favorable for prey species (Clark et al. 1989).

American marten was selected by the Idaho Panhandle Forest Plan as a management indicator species (MIS), and represents species using mature and old-growth habitats. In addition to a closed canopy, marten require an abundance of large downed logs and snags. These provide secure resting locations, denning habitat and winter access to small mammals living beneath the snow (Patton and Escano 1990). American marten are easily trapped and are highly vulnerable to overharvest in areas accessible by fur trappers.

Rationale for No Further Analysis: Although the presence of marten has not been documented in the project area, anecdotal evidence suggests that marten are common and widespread throughout the District. Because of habitat similarities with fisher, the American marten will be treated as a guild with fisher in this document.

OTHER ISSUE #2 –

Report on Soils in the Twin Skin Project Area

Issue Indicator – Acres of detrimentally disturbed soils

The purpose and need of the Twin Skin HFRA project is to reduce fuels to create a lower intensity fire environment in the wildland urban interface of Moyie Springs, Idaho. Reducing expected fire intensity will make it safer and easier for fire fighters to suppress future fires when they occur, thus improving the safety of people, their homes and property, associated access roads and utilities in this affected area. This report summarizes the existing condition of the Twin Skin project area as it relates to soil productivity, including the analysis of the direct, indirect and cumulative effects of the proposed action.

1. Regulatory Framework

The regulatory framework providing direction for protecting a sites inherent capacity to grow vegetation comes from the following principle sources:

- *The Multiple Use-Sustained Yield Act of 1960*
- *The National Forest Management Act of 1976 (NFMA)*
- *The Forest Plan and Regional Soil Quality standards (2554.03-R1 Suppl. 2500-99-1)*

The Multiple Use-Sustained Yield Act of 1960 directs the Forest Service to achieve and maintain outputs of various renewable resources in perpetuity without permanent impairment of the land's productivity.

Section 6 of the National Forest Management Act of 1976 (NFMA) charges the Secretary of Agriculture with ensuring research and continuous monitoring of each management system to safeguard the land's productivity.

To comply with NFMA, the Chief of the Forest Service has charged each Forest Service Region with developing soil quality standards for detecting soil disturbance and

indicating a loss in long-term productive potential. These standards and guidelines are built into Forest Plans.

Forest Plan direction (Forest Plan, p. II-17) is to manage the soil resource to maintain long-term productivity. The objective is that management activities on forest lands will not significantly impair the long-term productivity of the soil or produce unacceptable levels of sedimentation resulting from soil erosion. Forest plan standards are addressed in Section 5 of this report.

The Regional Soil Quality Standards (R-1 Supplement 2500-99-1) were revised in November 1999. Manual direction recommends maintaining 85% of an activity area's soil at an acceptable productivity potential with respect to detrimental impacts, including the effects of compaction, displacement, rutting, severe burning, surface erosion, loss of surface organic matter,and soil mass movement. This recommendation is based on research indicating that a decline in productivity would have to be at least 15% to be detectable (Powers, 1990). In areas where more than 15 percent detrimental soil conditions exists 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. These standards do not apply to intensively developed sites such as permanent roads/landings, mines, developed recreation and administrative sites.

2. Methodology Used in the Soil Productivity Analysis

Analysis of the soil resource was carried out utilizing aerial photography, geographic information systems (GIS) data, timber stand data base (TSMRS), published literature, and site specific field data. The alternatives were analyzed to allow for various harvest unit proposals and to identify units that would require design modifications to achieve Regional and Forest Plan standards. Some discrepancies may exist on acreage due to rounding.

Each proposed harvest unit was field reviewed by the project leader in 2006 and 2007 with an initial "Documentation of Soil Disturbance" (available in the project file) for determination if an additional field assessment for coarse-woody debris, organic matter, and level of compaction was necessary. The initial disturbance data sheet documents if past disturbance in the form of stumps, skid trails (including excavated skid trails), old roads, skyline corridors, landings, slash piles, horse logging, homesteads/pastures, seepage, slumps, landslides, or other visible disturbance of the soil has occurred.

In those units where past disturbance was known to have occurred (such as from previous harvest activities) or in units where there is visual evidence of past disturbance as noted in the initial disturbance data sheets, on-site assessments of detrimental disturbance, coarse-woody debris, and organic matter were collected (See soils field data in project file – Soils Documents 007-016). That information is summarized in Table 2 to follow.

3. Affected Environment

The analysis area for soil resources encompasses all land within an individual treatment unit or a compilation of all the individual harvest units and associated temporary roads and landings. Existing classified National Forest system roads are considered designated lands and, as such, the loss of soil productivity due to their construction will not be considered in the cumulative effects analysis.

3.A. Geology and Soils

The project area lies just east of the Moyie River within the lower reaches of Skin Creek, south of Deer Creek along the southern end of the Purcell Mountain range located in Idaho. Numerous benches and ridges have been formed by glaciation and as the river and stream courses formed steep V-shaped channels along the sides of the main ridges.

The parent geology includes numerous formations of Precambrian metasedimentary Belt series rocks at higher elevations that protrude over glacial and alluvial deposits along the valleys and several mountain slopes and benches (Soils Appendix A – Figure 1). Steep rocky breaklands have formed along the Moyie River side within the project area and support less vegetation. The remaining topography is dominated by primarily convex mountain sideslopes that are minimally dissected.

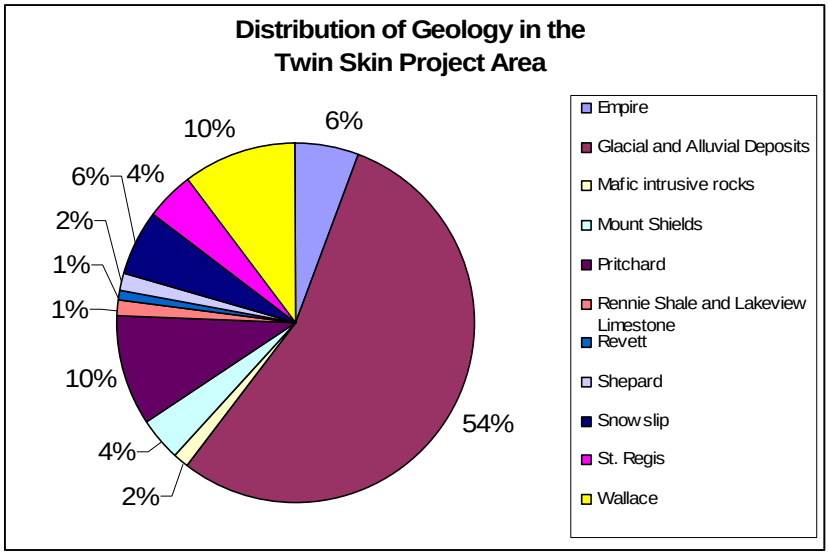

Figure 1. Distribution of geology in the Twin Skin Project Area

Throughout the project area, the soil has developed in a mosaic pattern as dictated by topographic relief, vegetation, and aspect. An elevation difference of 2000 feet is attained from the Moyie River to Solomon Mountain, which lies within the project area. The dominant soils contain a surface layer of ash about 12 inches deep and are of silt loam to sandy loam texture with 5 to 20% glacial and alluvial rock fragments that increase in amount and size at a depth of approximately 12 inches.

Under the timber stands, a silt loam soil formed in a thin mantle of volcanic ash and the underlying glacial drift. The volcanic material accumulated from several volcanic eruptions from the Cascades, including Mount St. Helens. However, most of the ash originated from Mt. Mazama in Oregon about 6,700 years ago. The uppermost part of the ash is usually enriched with organic matter that is incorporated into this part of the soil and has a high water and nutrient holding capacity, both of which are important for soil

productivity. Many local species thrive in these ash-capped soils but subsoils below this ash layer are not as fertile. Rocky, open convex slopes are less influenced by ash.

3.B Soils and Productivity

The practice of timber management can have long-lasting impacts on the soil resource if precautions are not taken. The **following four design criteria** relate to soil productivity in the project area.

3.B.1 Detrimentally disturbed soils within activity areas (harvest units)

Detrimental soil impacts are defined as the proportion of an activity area that may be subjected to displacement, compaction, erosion, or severe burning due to a particular management activity (such as harvest or fuels treatments), exclusive of dedicated resources (such as system roads). The soils in an activity area are considered detrimentally disturbed when the following soil conditions exist as a result of forest management practices:

a. *Soil displacement results in the loss of either one inch of or half of the humus-enriched surface layer (A-soil horizon), whichever is less. The loss of the litter layer alone could be detrimental on some marginal sites. Displacement removes the most productive part of the soil resource. Roading, ground-based yarding, dozer piling and cable corridors are the major contributors to displacement.*

b. *Soil compaction that results in a 15 percent or more increase in bulk density, or a 50% reduction in water infiltration rates typical for volcanic ash influenced surface soils. Soil compaction reduces the supply of air, water and nutrients to plants. Roading, ground based yarding and piling are the major contributors to compaction. Design features would be built-in to reduce potential soil impacts. This would be accomplished by incorporating existing skid trails into the new layout and using slash mats whenever possible (Eliasson and Wästerlund 2007).*

c. *Surface erosion is indicated by rills, gullies, pedestals, and soil deposition and should be kept within tolerable limits by retaining enough ground cover, depending with onsite conditions.*

d. *Fire consumes most woody debris and the entire duff and litter layer, exposing mineral soil. Burn ash that is white or reddish color, indicates that much of the carbon was oxidized by fire (Burned-Area Emergency Rehabilitation Handbook FSH 2509.13). Burns that create very high temperatures at the soil surface when soil moisture content is low result in an almost complete loss of surface and upper soil horizon organics. Many of the nutrients and ectomycorrhizae associated with these organics can be lost to the atmosphere through volatilization and removed from the site in fly-ash (Garrison and Moore 1998) or lost to high ground temperature flux (Harvey et al. 1986 p. 7).*

3.B.2 Low Potassium Sites – Sites containing geologic formations that are naturally deficient in potassium bearing minerals

Whole-tree yarding and removal of treetops can lead to the direct loss of potassium (Morris and Miller 1994). On some sites, 45 percent of the available potassium is detained in trees, with the remainder being held in subordinate vegetation, forest floor, and soil pools. Within the trees, about 85 percent of the potassium is held in the branches, twigs, and foliage (Garrison and Moore 1998; Moore et al. 2004b). It is therefore vital to recycle as many nutrients as possible before removal which can be done by overwintering small-scale debris to leach out potassium (Baker et al. 1989; Barber and Van Lear 1984; Edmonds 1987; Garrison and Moore 1998; Laskowski et al. 1995; and Palviainen et al. 2004).

Under most natural circumstances, potassium returns to the soil when the tree dies. Unlike many other soil nutrients, potassium is derived primarily from underlying geologic formations and is a product of slow weathering processes. Almost half of the Twin Skin project area is within the resistant Precambrian metasedimentary Belt series group (as shown in Figure 1 above).

The Intermountain Forest Tree Nutrition Cooperative (IFTNC) continues to research potassium contents within tree species and different rock types in order to establish specific minimum thresholds for retention and effects of potassium on tree growth and resistance to root diseases (Mika 2005; Shaw 2005). Until these minimum thresholds are developed through research, the Idaho Panhandle National Forests are using management recommendations from the IFTNC as a guideline for maintaining sufficient potassium on a site. These measures have been incorporated into the features designed to protect soils:

A. *Practice conventional removal (lop and scatter) rather than whole tree removal. The "lop and scatter" technique should be practiced during intermediate as well as final harvest operations.*

B. *Let slash remain on site over winter so mobile nutrients such as potassium can leach from fine materials back to the soil. For this project, the logging slash from tree limbs, tops, and un-merchantable pieces would stay within all harvest units and be allowed to remain for one wet season before being underburned or grapple piled. A determination of fire hazard will be made by the district fire management where slash is left untreated for prolonged periods of time. Where fire hazard is considered high, especially near roadsides, flexibility will be given to treat slash more aggressively.*

C. *Light broadcast burn or underburn for release of potassium and other nutrients. Units 9 and 10 would be underburned with the proposed action.*

D. *Plant species appropriate to site. White pine and western larch will be planted on the moister sites and ponderosa pine and some western larch would be planted on drier sites.*

3.B.3 Maintenance of large woody debris and organic matter

The third soil productivity criterion relates to the management of coarse woody debris and organic matter, and follows the research guidelines contained in Graham et al.

(1994). Retaining coarse woody debris and organic matter is important to maintaining the soils most productive layer. Coarse woody debris is defined as material derived from tree limbs, boles, and roots greater than three inches in diameter and in various stages of decay and performs many physical, chemical, and biological functions in forest ecosystems and is a key habitat component for many wildlife species and for stream ecology (Graham et al., 1994). Because coarse woody debris is such a valuable part of a functioning ecosystem, a portion of the material must be maintained to ensure that organic matter is recycled for long-term productivity. Nevertheless, in natural systems organic matter fluctuates with forest growth, mortality, fire, and decay.

The average optimum level of fine organic matter is 21 to 30 percent (Graham et al. 1994), which equates to 1 to 2 inches of surface litter and humus. Optimum levels of fine organic matter relate to ectomycorrhizae fungus, which is a good indicator of healthy forest soil. In moist western hemlock and cedar habitat types, strong levels of ectomycorrhizae exist when organic levels exceed 30 percent. Soil survey data indicates that most forest sites have adequate organic matter levels to support strong ectomycorrhizae populations (see on-site assessments in project file).

This soil productivity criterion is addressed as a guideline and is not part of the alternative evaluations because project alternatives are designed to meet the large woody debris guidelines as referred to in Graham et al. (1994) and silvicultural prescriptions.

3.B.4 Biomass Removal

Biomass utilization that may be conducted for this project would focus on the removal of small woody materials that would in other cases not be removed with sawlog products (such as the branch wood and tops of trees). Without biomass utilization, this material would be piled and burned or underburned in the fuels treatment implementation of this project. Most biological activity in the soil takes place in the surface soil or litter layers. Although this is a potential source of biomass, it is extremely important to maintaining a wide variety of ecosystem functions such as nutrient supply, erosion control, water retention, and rooting medium and should not be removed without strong overriding silvicultural reasons. This is true for all sites, not just nutrient sensitive locations. In most cases biomass harvesting may not create additional or increased physical impacts to soil productivity as compared to conventional forest harvesting is with respect to nutrient removals. Reducing more biomass from a site inevitably removes more nutrients. Some mineral soils have a sufficient nutrient capital to tolerate a larger number of such harvest rotations while others may reflect more deleterious effects. Current management recommendations, based primarily on findings by the IFTNC, are currently used to protect that resource (Garrison and Moore 1998; Garrison-Johnston et al. 2007). These include soils associated with formations of the Precambrian metasedimentary Belt Supergroup and granitics (Garrison-Johnston et al. 2007). However, additional assessments may be required if aggressive biomass removal is proposed over multiple rotations in the future.

4. Existing Conditions

Four criteria were used to assess existing conditions for soil resources:

4.A Landtypes and hazard ratings of the Idaho Panhandle National Forests;
4.B Soils and productivity;
4.C Wildfire and severely burned soils;
4.D Existing site conditions and past activities.

4.A Landtypes and Hazard Ratings

Seventeen landtypes have been identified and mapped in the project area, nine of which are in proposed treatment units (although two of them only account for 0.7 total acres). Eighty percent of the proposed treatment units are in landtypes classified as glaciated belts – twenty percent are grouped into flood plains, meadows, and stream terraces. Descriptions of each landtype, detailed acreages for the action alternative, and maps displaying landtypes and hazards are contained in the project file (Documents Soils 001, 002 and 004). Hazard ratings have also been compiled based on these landtypes and are listed in subcategories for mass failure, surface erosion, sediment deliver potential, and soil productivity. These are rated as low, moderate, or high for each landtype and are summarized in the following table.

Table 1. Landtype hazard ratings associated with the proposed action

Harvest and Fuels Activities	Mass Failure Potential			Surface Erosion Potential			Sediment Delivery Potential			Soil Productivity	
	L	M	H	L	M	H	L	M	H	L	M
Proposed Action	96%	4%	0%	96%	4%	0%	96%	4%	0%	4%	96%

Mass Failure Potential is the relative probability of downslope movement of masses of soil material. Besides natural failure, landslides or slumping can be triggered by a number of mechanisms, including harvest activities, severe burning, and related road building.

Mass failures detrimentally disturb soils because organic matter, the productive ash layer, and even subsurface layers of the soil can be carried down slope during a failure.

The majority of the proposed treatment area has low mass failure potential. Those areas that are considered to have a moderate mass failure potential occur on steeper slopes in Units 9 and 18 – both of which will be skyline harvested. Those acres that occur in Unit 18 are slivers and may actually be outside of the unit boundary once layout has occurred. The GIS layer also shows the moderate mass failure potential polygon overlapping a small portion of Unit 13. However, this unit is on a flat bench and there is no observed soil movement. As this unit was previously treated in 1990, harvest activities with this entry would be less intensive with machinery and focus on the manual removal of smaller diameter submerchantable trees.

Although the removal of forest canopy cover from clearcutting or wildfire increases landslide occurrence (Gray and Megahan 1981; Megahan et al. 1978), little research has been conducted to determine if partial cutting affects landslide rates. Megahan et al. (1978) found that landslide occurrence increased only slightly when overstory canopy was reduced from 100% to 11%, but increased dramatically when canopy closure when below 11%. They also found that crown cover from shrubs affected landslide occurrence after 80% crown removal and indicated that landslide occurrence is more sensitive to shrub than tree crown removal.

Surface Erosion Potential is a rating of the relative susceptibility of exposed soils to sheet and rill erosion.

The same units that show a moderate mass failure potential also have a moderate surface erosion potential mostly due to steeper slopes. The majority of the affected area will be skyline harvested (<6 acres occur in Unit 13 which would be tractor harvested). Most of the acres considered to have a moderate surface erosion potential are within Unit 9 (22 out of 30 acres). This unit will be skyline harvested and the prescription is group selection/commercial thin which will leave about twice as much basal area than would a regeneration harvest. In addition, there will be no ground disturbing machinery used at any phase of implementation in Unit 9 – as it will be prescribed underburned following skyline harvest. Units 13 and 18 will be grapple-piled following harvest to treat concentrations of slash.

Sediment Delivery Potential is a rating of the probability of eroded soil reaching a stream channel. By using slope gradient, slope shape, and distance to channel, a rating of low, moderate, or high potential is determined.

Portions of Units 9 and 18 have a moderate sediment delivery potential. Unit 9 is a steep slope occurring on a west aspect facing the Moyie River. There are a few benched areas within the unit. Skyline harvesting followed by a prescribed underburn will mitigate chances for soil erosion in this unit (there will be no machinery used at any phase of implementation). Unit 18 occurs north of Skin Creek – the observed topography and orientation of this unit on moderate slopes and benches suggests that sediment delivery to Skin Creek or the Moyie River is highly unlikely. Following BMPs, Skin Creek will be buffered by at least 300 feet, where no project related activities will occur.

Productivity Potential is a rating of the relative capacity or ability of a soil to produce and sustain biomass.

Visually, the majority of the project area has a moderate to high productivity potential, as even the drier sites have a good representation of vegetative material in all layers. Many of these stands are considered moist forest and have an abundant amount of biomass and trees are still reproducing successfully on even the densest stands. Some of the proposed treatment units border rock outcrops that are void of vegetation.

4.B Soils and Productivity

The soils found in the Twin Skin Project Area owe their productivity to excellent nutrient-holding capacities and other favorable characteristics provided by a volcanic ash layer. However, these generally young and poorly developed soils can experience long-term deficiencies when biologically essential elements, like organic matter and coarse woody debris, are not sufficiently available.

Organic matter content varies throughout the activity areas but is generally low to optimum for most surveyed units. Localized variability and depths are natural and usually correlate to habitat type and aspect with excessive needle cast often decreasing the establishment of a more herbaceous ground cover.

Coarse woody debris (CWD) was found to be variable as well (Table 2). Some stands contain higher amounts of down wood, generally on the moister east-facing slopes, pockets that have been excluded from fire and past management, or sites that contain elevated tree mortality. Drier south-facing slopes and ridges have lower CWD levels that often reflect shallower soils and past harvest activities, such as in Units 11, 12, and 13. Decomposition may also be affected due to light and moisture variations under different canopy densities.

4.C Wildfire and Severely Burned Soils

Natural disturbance events commonly reset watersheds and influence water quality and stream habitat. Wildfire is a natural component in forest watersheds, and has influenced forest soils and watershed processes for thousands of years. However, as a result of fire suppression during the last century (among other things such as the loss of white pine due to blister rust), natural fire regimes have been altered throughout north Idaho (Smith and Fisher 1997).

Records of historic wildfires enforce that the potential for future wildfire remains, especially if a fire ignites in an untreated area under dry weather conditions and with a general climate change suggesting a warming trend in the future. Fire records show that portions of the project area have burned in previous events dating back to the late 1800s. Forest types found within the project area were dependant on fire in one form or another – either stand replacing or mixed severity to create a mosaic of structure types and species compositions, or typically low severity to perpetuate open conditions (see fire and fuels report).

Severe deteriorating effects that wildfires have on soils usually include loss of organics and nutrients and a reduction of water infiltration (Wells et al. 1979). Burns that create very high soil surface temperatures, particularly when soil moisture content is low, result in an almost complete loss of soil microbial populations, woody debris, and the protective duff and litter layer over mineral soil. Since erosion increases following a fire are often directly proportional to fire intensity (Megahan 1990), the removal of ash-capped surface soils could reduce soil productivity.

Many of the nutrients present in surface organics and large woody debris can also be lost to the atmosphere through volatilization and removed from the site in fly-ash (DeBano 1991; Amaranthus et al. 1989). Burn ashes are usually gray or reddish in color, indicating that much of the carbon is oxidized by fire.

Depending on fire severity and plant characteristics, many plants will survive and re-initiate growth soon after a fire. However, the ability of surviving plants to reestablish, thrive, and reseed in subsequent years will be greatly affected by the presence of invasive plants and weeds (Goodwin and Sheley, 2002). Burned areas can contain high initial nutrient levels, exposed ground surfaces, and low shade with high light conditions which all directly favor colonization of new and remaining invasive plants. Survival coupled with disturbances produced by fire can cause rapid and expanded invasive plant growth. As a result, values such as wildlife habitat, watershed stability, and water quality often deteriorate.

When soils turn hydrophobic, water infiltration is reduced. Though hydrophobicity is a naturally occurring phenomenon that can be found on the mineral soil surface, it is greatly amplified by increased burn severity (Huffman et al. 2001). The heat of a fire vaporizes hydrophobic compounds in the organic matter and moves them into the soil layer where they condense and form a water repellant coating on the soil particles. Soil hydrophobicity usually returns to pre-burn conditions in no more than six years (DeBano 1981; Dyrness 1976) and other studies have documented a much more rapid recovery of one to three years (Huffman et al. 2001). However, before infiltration improves, increased overland runoff and sediment movement can be expected.

If a severe fire were to occur that caused hydrophobic soils in the project area, the primary risks for erosion and mass failure would be from roads, especially at stream crossings and culvert locations. Following a severe fire, rehabilitation efforts to mitigate the fire's effects on erosion and sediment delivery would likely occur, substantially reducing potential negative effects.

4.D Existing Site Conditions and Past Activities

Past harvest is evident throughout the project area, generally as tree stumps and skid trails. Results from on-site field assessments within proposed activity areas estimate that the existing soil disturbance totals 46 acres (Table 2; see on-site assessment monitoring sheets in the project file). Impacts are concentrated on skid trails that converge and intersect throughout the units or portions of units. Compaction levels vary on trails with many showing less initial impact or increased recovery compared to heavier used trails that still show clear signs of compaction. The presence of large rotten logs in the subsoil of several units (such as the moister, more productive units 1, 3, 5, 6, 8, and 15) may have lessened some of the past equipment impacts which otherwise could have been higher. Burn piles are present in Units 11, 12, and 13, but soils have recovered quite well, showing no hydrophobicity or discoloration, little to no weeds in the disturbed areas, and some apparent tree regeneration.

The majority of existing impacts have occurred in Units 4, 12, 13, and 15. Units 4, 12, and 13 were treated previously with timber sales in the 1990s, while Unit 15 has some evidence of past selective harvest, likely in the 1930s (EA Appendix C), but also it appears that there has been some incidental ATV use (Project File Document Soils 008). None of the proposed units exceed the Regional Soil Quality Standards (Table 2).

Moist site species, such as grand fir and cedar-hemlock, dominate in Units 1, 3, 4, 5, 6, 8 and 15 and have attributed a heavy fuel load consisting of tangled down and partially down debris. Many rotten logs are buried, barely visible, or partially submerged, suggesting that the actual tons per acre calculated are likely higher. Douglas-fir and occasional larch and lodgepole are also present but little to no regeneration of trees or other vegetation occurs on the forest floor due to the density of canopy.

On drier sites, such as in Units 2, 7, 9, 10, 16, 17, and 18, Douglas-fir, ponderosa pine, and larch are the predominant tree species. An often thick accumulation of shrubs has established in the understory but organic matter and coarse woody debris is usually much lower on these dry sites compared to moister stands.

Table 2. Summary of Proposed Action and Existing conditions by units following guidelines in Niehoff (2002). See project file for data collection sheets which include associated field notes.

Unit	Activity Acres	Proposed Treatment	Logging System	Slash Treatment	Existing Condition %	Coarse Woody Debris tons/acre
1	52	FS	T	GP	5	19.1
2	36	CT/SS	S	GP	5	12.4
3	58	FS	T	GP	5	14.5
4	9	SW	S	GP	13	14.3
5	8	SW	S	GP	5	16.1
6	52	FS	T	GP	9	18.1
7	18	CT/SS	T	GP / UB	8	11.7
8	25	FS	T	GP	8	9.9
9	26	GS/CT	S	UB	-	*
10	54	GS/CT	S	UB	-	*
11	40	WR/IC	T	GP	7	11.0
12	14	WR/IC	T	GP	12	6.8
13	46	WR/IC	T	GP	13	7.1
14	20	CT/SS	T	GP	-	*
15	34	ISW	T	GP	13	14.5
16	42	CT/SS	T	GP	8	6.5
17	11	CT/SS	T	GP	8	40.3
18	146	CT/SS	Swing	GP	7	14.1
PCT	22	PCT	Hand Fell	-	-	*
Total (acres)	713				46	

CT – Commercial Thin
GS – Group Selection
SS – Sanitation Salvage
S – Skyline

Coarse Woody Debris based on Graham et al. 1994.

Existing Condition: Detrimental Soil Disturbance – Evidence of detrimental disturbance based on observable soil characteristics indicating

T – Tractor FS – Free Selection SW – Shelterwood ISW – Irregular Shelterwood WR – Weed Release IC – Improvement Cut PCT – Precommercial Thin UB – Underburn GP – Grapple-pile	that the site meets detrimental soil damage criteria defined in the Regional Soil Quality Standards. Detrimental soil disturbance cannot exceed 15% of an activity area. **Units 9, 10, 14 showed no signs of detrimental disturbance (documentation in project file), thus data on detrimental disturbance was not collected. There will be no mechanized equipment in the PCT unit. CWD was not collected in Units 9, 10, 14 or the PCT units because transects were not needed – see fuels report for estimates of CWD.

Existing Roads and Transportation

The present road system designated as "classified" (Forest Development Roads) on the National Forest transportation system are considered dedicated lands and total approximately 41 miles within the project area. There are approximately 7 miles of "unclassified" roads (non-dedicated roads, which are not considered necessary for long-term forest management objectives), the majority of which were created during mining activities in the 1930s through 1950s. However, only 6 miles of classified and 2 mile of unclassified roads exist within the proposed treatment areas.

5. Environmental Consequences to Soils

5.A Methodology Used to Analyze Environmental Consequences to Soils

This analysis includes potential effects from proposed logging systems, unclassified and temporary roads, landings, and prescribed burning and fuel break treatment on soils. To determine whether proposed activities would detrimentally impact or have cumulative effects on soils, the IPNF Soil NEPA Analysis Process (Niehoff 2002) was used. For each alternative, the detrimentally disturbed acres were calculated using coefficients based on past IPNF soil monitoring data. The coefficients were developed as an average soil disturbance level and equated to harvest equipment, time of year (summer vs. winter logging), fuel treatment methods, and the time of year fuel treatment took place. Since the coefficients are based on an average, the areas that have had prior harvest activities could have soil disturbance levels lower or greater then the coefficient's average. This monitoring information is contained in Forest Plan Monitoring and Evaluation Reports and is summarized in the IPNF Soil NEPA Analysis Process (Niehoff 2002). Calculations incorporated the acres and types of proposed logging, burning, and roads/landings constructed for direct and indirect effects.

Based on past monitoring efforts (Niehoff 2002), tractor logging prior to 1990 has had the most detrimental soil impact and ranged between 24 and 42 percent. Since 1990, tractor logging methods and recommended protection measures have decreased most detrimental impacts to an average of 13 percent (Niehoff 2002), which is two percent less than the maximum allowable criteria established by the Regional guidelines. Skyline/cable logging systems tend to have approximately 2 percent detrimental effects (Niehoff 2002) and (McIver and Starr 2000, pp. 11-16) – skyline logging followed by

grapple-piling would be expected to have greater disturbance – approximately 8 percent. Skyline/cable logging systems have less impact than tractor systems because the equipment stays on the road and the logs are partially suspended, restricting impacts to times when logs are being dragged over the ground (Krag 1991; Seyedbagheri 1996, pages. 7-9).

Direct effects on soils from proposed activities were measured by analyzing the effects of compaction, erosion, severe burning, rutting, and displacement on the soil surface that is the most productive layer and also the easiest to disturb through activities. Potential impacts would result from the type of logging system and fuel treatments used and area disturbed due to construction of roads and landings.

Compaction, displacement, rutting, and severe burning can affect the soils physical, chemical, and biological properties, which indirectly can affect the growth and health of trees and other plants. Compaction reduces soil permeability and infiltration, which can cause soil erosion. Displacement reduces plant growth where topsoil and organic matter are removed. Severely burned soils can become hydrophobic (water repellent) and lead to increased erosion, runoff, and/or reduced productivity.

Tractor and skyline/cable logging systems would be utilized under the Proposed Action. Roads and landings that are to remain on the landscape for future use cause irretrievable effects on productivity as those lands become "dedicated" lands. Those roads that are temporarily needed for project work and are planned for decommissioning have detrimental effects initially, but rehabilitation efforts (ripping, recontouring) would initiate a long-term recovery sequence. Vegetative recovery time is approximately 30 to 40 years as the second growth timber becomes established around the disturbed areas and develops enough crown foliage to intercept and evapotranspirate moisture (Dykstra and Curran 2002, Froehlich et al. 1985).

Acres of detrimental disturbance were calculated by multiplying the areas of activity disturbance by the disturbance coefficient derived from monitoring reports. Coefficients used for proposed logging systems are displayed in Table 3 below.

Table 3. Potential detrimental disturbance coefficients used for various logging and prescribed fire scenarios.

Tractor Logging	**% Detrimental Disturbance Coefficients**
Summer logging with burning or grapple piling	13
Winter logging with burning or grapple piling	10
Skyline Logging	
Skyline logging with underburning	2
Skyline logging with grapple piling	8

Road calculations used 30-foot widths that take into account a 14-foot wide running surface and includes the cut and fill slope disturbance. Log landing areas associated with proposed units are accounted for in the calculations. Log landings that are proposed

outside of any harvest units are each calculated as one acre. Effects to these areas would be considered irretrievable and identified as "dedicated" lands.

Indirect effects include the loss of site productivity due to the removal of large woody debris and nutrients. Large woody debris is essential for maintenance of sufficient microorganism populations and long-term site productivity. Research has indicated that potassium (among other nutrients) is an important element for site productivity and may be deficient among certain geologic parent material (Garrison-Johnston et al. 2007). Design features are incorporated into the activities to meet the management of large woody debris and organic matter as detailed in the research guidelines contained in Graham et al. (1994). These recommendations emphasize tons per acre and are defined as any woody residue larger than three inches in diameter.

On potassium limited sites, tree tops, foliage, and branches would be left to overwinter, which allows potassium to leach out of these materials (Baker et al. 1989; Barber and Van Lear 1984; Edmonds 1987; Garrison and Moore 1998; Laskowski et al. 1995; and Palviainen et al. 2004). The reduction of available potassium leaching back into the soil profile could affect tree growth.

Since this is a fuels reduction project, determination of fire risk where slash is left untreated for prolonged periods of time will be made by the district fire management officer. Where fire risk is considered high, especially near structures, flexibility will be given to treat slash prior to it being left for 6 months.

5.B Direct and Indirect Effects to Soils under the No-Action and Proposed Action

5.B.1 Wildfire Impacts

Depending on the intensity of the fire and the severity of its effects, wildfire can alter watershed soils by consuming the erosion-limiting litter layer at the top of soils and the binding organics within the soil (Ice 2003). Condensation of volatized organics on soil surfaces often result in water-repellant (hydrophobic) soil conditions (DeBano 1981; Doerr et al. 2000; Dyrness 1976) that can contribute to overland flow and increased in-channel failures (Ice 2003).

Given the absence of fire over numerous decades and increased fuel loads in many parts of the project area, the chance of a wildfire occurring could be enhanced if an ignition starts in an untreated area during extreme dry weather conditions (Heyerdahl et al. 2007). The proposed vegetation and fuels treatment in the project area would not necessarily prevent wildfires from occurring, but would increase the ability to suppress such a fire should ignition occur in treated areas (Maurer 2007). Vegetation and fuel treatments would reduce the chance that a wildfire could have as severe of an effect on the soils and surrounding private property in treated areas as it could in untreated areas because there would be a reduction in the tons per acre of dead and dying fuels on those treated sites.

The occurrence of a high intensity wildfire would have an increased potential for impacts to soils and soil productivity in severely burned areas, especially since the risk of soil

erosion increases proportionally with fire intensity (Megahan 1990). Other effects would include the potential loss of organics, loss of nutrients, and a reduction of water infiltration (Wells et al. 1979). Burns that create very high soil surface temperatures, particularly when soil moisture content is low, result in an almost complete loss of soil microbial populations, woody debris, and the protective duff and litter layer over mineral soil (Hungerford 1991; Neary et al. 2005). Nutrients stored in the organic layer (such as potassium and nitrogen) can also be lost or reduced through volatilization and as fly ash (DeBano 1991; Amaranthus et. al. 1989).

Fire-induced soil hydrophobicity is presumed to be a primary cause of the observed post-fire increases in runoff and erosion from forested watersheds (Huffman et al. 2001). Though hydrophobicity is a naturally occurring phenomenon that can be found on the mineral soil surface, it is greatly amplified by increased burn severity (Doerr et al. 2000; Huffman et al. 2001; Neary et al. 2005).

Soil hydrophobicity usually returns to pre-burn conditions in no more than six years (DeBano 1981). Dyrness (1976) and other studies have documented a much more rapid recovery of one to three years (Huffman et al. 2001). The persistence of a hydrophobic layer will depend on the strength and extent of hydrophobic chemicals after burning and the many physical and biological factors that can aid in breakdown (DeBano 1981). This variability means that post-fire impacts on watershed conditions are difficult to predict and to quantify.

If hydrophobic soils result from a severe, high temperature fire, moderate surface erosion could occur but the potential for mass failures would be low to moderate because of the Twin Skin Project Area's overall landtype characteristics; however, localized slope movement could be possible. The areas of primary risk after a severe burn include continuous steep mountain sideslopes located above the breaklands of the Moyie River and Skin and Deer Creeks, especially if no benches or river terraces are present to provide for buffer zones where sediments could settle out. Following a severe fire, rehabilitation efforts to mitigate the fire's effects on erosion and sediment delivery would be performed as funding became available.

The probability of a high severity fire is not certain to occur within the project area during a given timeframe. The fact, however, is that when a fire breaks out, the chances for high severity fire effects on soils can be much higher in untreated areas with excessively heavy fuel loads compared to those that have successfully completed treatment, including post-harvest logging slash (Graham et al. 2004; Gorman 2003; Keane et al. 2002).

Agee & Skinner (2005) make a valuable statement regarding the impacts of activities versus wildfire:

> "[w]hile the impacts of thinning and burning can be predicted, and may have some negative environmental impacts, these impacts need to be evaluated against the option of ''no action".

The impacts of thinning and prescribed burning can be reasonably predicted whereas the potential impacts of wildfire, especially on soils, are virtually unpredictable because of

naturally variable conditions during the time of burning. Past examples, such as the Sundance fire that burned 56,000 acres in 1967 in the Selkirks, still display reduced soil productivity to this day. Silviculturally treated stands experience less severe fire damage and subsequently less loss of litter and herbaceous loading, thus, these stands are less susceptible to soil loss and more conducive to residual plant growth and recovery (Cram et al 2006).

5.C Direct and Indirect Effects to Soils with No-Action

The effects of No-Action would be consistent with the current condition in the near term, as no management would occur within the proposed treatment units. In the long-term, those soils that have detrimental disturbance from previous activities would continue to recover, aside from any rare events within the project area (such as landslides) due to various factors – in-growth of vegetation, freezing and thawing, soil organisms, and incorporation of dead material into the soil horizons.

With No-Action, no new management induced detrimental soil impacts would occur in the Twin Skin Project Area. Stands currently at high mortality risk would not be treated, which may increase infestation levels and associated risks of stand loss due to wildfire, severe burning, erosion concerns, and loss of soil nutrients. In the absence of such a hot fire, nutrients would be retained on site. On a landscape scale, fuel loads would continue to increase and the promotion of more fire-resilient species, such as western larch and ponderosa-pine, would not occur (see Specialist's report on Fire and Fuels for direct effects).

No direct effects to the soil resource would occur with No Action since there would be no road construction, logging, or fuel treatment activities. There would be no compaction or displacement beyond what currently exists. Throughout the silvicultural landscape, tree mortality from pathogens, insects, and weather events would likely continue as in the past, which has a direct influence on the area's recycling of organic matter and changes in fuel loading. In moister habitat sites, increase in organic matter has a more beneficial function to overall soil productivity because it fosters formation of ectomycorrhizae that enhances nutrient and water uptake (Graham et al. 1994). In dry habitat types, increases of organic matter may result in negative response because organic materials are likely too dry for ectomycorrhizal growth and can reduce natural regeneration of dry site species adapted to a habitat with shorter fire return intervals (Graham et al. 1994).

5.D Direct and Indirect Effects to Soils of the Proposed Action

Effects of the proposed treatments on soil productivity would vary depending on time the type of activity and what time of year they take place. Soils with high moisture content tend to be the most sensitive to compaction and soil displacement such as rutting.

Direct and Indirect Effects of Harvest Treatments– By using the coefficients displayed in Table 3, a prediction of detrimental disturbance based on the type of

treatment and number of treatment acres can be made. If the proposed treatment is implemented, tractor harvesting will occur on approximately 462 acres followed by grapple-piling. In addition, approximately 228 acres will be skyline harvested – 80 acres followed up with prescribed underburning, leaving up to 148 acres grapple-piled. There are no acres proposed for helicopter logging and the 22 acre pre-commercial thin unit will be hand felled and the material will be either scattered, utilized, or some concentrations may be piled.

Harvest activities would occur in the summer for all units except 12 and 13 which would be winter logged. Normally, an adequate slash mat during the summer would mitigate potential impacts (Eliasson and Wästerlund 2007) to keep detrimental disturbance below the 15% requirement, however, these two units will likely not have an adequate slash mat for machinery to operate. Therefore winter logging will be needed for mitigation so that harvest machinery can operate when the ground is either frozen or there is a snow-pack (12 inches of snow or greater). The following table summarizes the expected detrimental disturbance for the proposed action following implementation of all treatment activities.

Table 4 – Summary of expected detrimental disturbance in acres by activity type

Tractor Logging	**Treatment Acres**	**Detrimental Disturb. Acres**	**Proposed Temp. Road Miles**	**Temp Road Disturb. Acres**
Summer with grapple piling – 13% expected detrimental disturbance				
1	52	7		
3	58	8	0.75	2.7*
6	52	7		
7	18	2		
8	25	3		
11	40	5		
14	20	3		
15	34	4		
16	42	5		
17	11	1		
18	50	7	0.25	0.9
Winter with grapple piling – 10% expected detrimental disturbance**				
12	14	2		
13	46	6		
Skyline Logging	**Treatment Acres**	**Detrimental Disturbance Acres**	**Proposed Temp. Road Miles**	**Temp Road Disturbance**
Skyline with Rx Underburn – 2% expected detrimental disturbance				
9	26	1		
10	54	1		
Skyline with grapple piling or PCT w/grapple piling – 8% expected detrimental disturbance				
2	36	3	0.5	1.8
4	9	1		
5	8	1		
18	96	8		
PCT	22	2		
Total Detrimental Disturbed Acres		**77**		**5.4**

*Unit 3 shows that 2.7 detrimentally disturbed acres could occur from temporary road construction. However, the location of this temporary road is in a location where a previous skid trail already exists. The existing detrimental disturbed acres takes into account this skid trail – thus the temporary road would not realistically be adding this much of an additional disturbance. However, this analysis focuses on a worst-case scenario. Incidental tractor will occur in unit 18 on up to 50 acres, thus that unit is split under skyline and tractor as shown above.
**Units 12 and 13 are currently detrimentally disturbed at 12 and 13 percent respectively. Thus winter only for mitigation will not reduce the compaction to 10% (10% is the amount of detrimental disturbance expected in a previously untreated unit). However, this mitigation should prevent further detrimental disturbance as winter only harvest requires machinery to operate on frozen ground or a snow-pack.

The proposed management activities have the potential to cause soil disturbance, such as compaction, by detrimentally affecting an estimated 77 acres from a long-term productive growing state. The temporary roads will disturb less than 6 acres – these roads will be obliterated following use which will contribute to decompaction. The disturbance is predicted to occur primarily in activity locations subjected to ground-based logging. **When considering all harvest activities (and temporary road construction) within the 713 acres of activity areas, the total disturbance level for the proposed action is approximately 12%.** None of the units individually will exceed 15% detrimental disturbance. "Design Criteria and Mitigation" in addition to BMPs would be used to decrease the effect of ground-based yarding systems – see section 3.B above (or Chapter 2, Section 2.4, Twin Skin HFRA EA). A more detailed explanation of the effectiveness of the design criteria is also available in the project file.

Because optional slash removal would occur in leiu of grapple-piling, there would be no additional detrimental disturbance expected from that activity (the disturbance for the grapple-piling activity was already estimated – the equipment used to remove biomass would be used in place of the equipment needed to grapple pile and disturbance is expected to be similar).

Monitoring for soil conditions following prescribed fire on the Idaho Panhandle National Forest has shown that retaining organic matter before implementing an underburn is important for protecting soils from detrimental disturbance. In addition, burning when soil moistures are greater than 25% helps protect the soils from the effects of severe burning – burn effects are generally low and recovery time is generally quicker (See project file for monitoring reports – Canfield Prescribed Burn).

Removal of infrequent roadside hazard trees is not expected to have any short or long-term detrimental effects on soil productivity because it would be incidental in nature and removal of the material can be done from the road (no mechanical equipment enters the stand). In addition, minimal nutrients would be removed from the site.

Direct and Indirect Effects of Landings and Temporary Road Construction - The action alternative proposes temporary road construction in three different sections of the project area, totaling <1.5 miles to allow access for harvest equipment and personnel – expected disturbance is <6 acres total.

Upon treatment completion, the entire lengths of all three roads would be obliterated which includes culvert removal, ripping and re-contouring the road prism, seeding, fertilizing, and topping the areas with woody debris and organic matter. Obliterating the temporary roads upon completion of use will help the recovery of soil productivity, improving infiltration, and reducing hydrologic effects from road surface runoff (Switalski et al. 2004). No new permanent roads will be constructed.

Landings are considered dedicated lands – existing landing will be used where possible (over 50% of the proposed landings are existing – see project file for map of landing locations). However, where previous treatment has not occurred, new landings will be necessary. These will be pre-determined prior to harvest by the sale administrator and through discussions with the project interdisciplinary team and will most likely be situated on the edge of existing system roads and generally within the road right-of-way, providing for the most economic and resource impact limiting locations.

Direct and Indirect Effects of Road Maintenance / Reconstruction – Existing access roads, including Forest Roads #435, #435UF, #2215, #2215A, #2215B, #2269, #2533, #2404A, #2549, #2584, #2584U, #2549UH, #2549UE and #627 may be used for this project. Segments of these roads (totaling approximately 14 miles) would require maintenance (reconditioning) or reconstruction (#2549UH and #2549UE) prior to use. Related work may include roadside brushing, blading, ditchline cleaning and shaping, spot graveling and culvert installation and replacement at locations recommended by the project IDT and removal of hazard trees along the haul routes. Refer to the Hydrology Specialist's report for additional information of road effects (EA Appendix B).

Direct and Indirect Effects of Pre-commercial Treatments – Pre-commercial thinning is planned for one previously harvested unit and would include 22 acres of hand-thinned fuels reduction. No mechanized equipment would be needed during the thinning operation although a small excavator may be used to pile slash concentrations depending on the amount of activity fuels created. The associated disturbance is estimated at 8% (<2 acres) as shown in Table 4 above. Biomass utilization would be encouraged over grapple-piling and would result in comparable levels of disturbance.

Direct and Indirect Effects on Soil Productivity - The Resource Area is under laid by weakly weathered glaciated Belt rock geology and alluvial material (Figure 1). Conservative nutrient management strategies are recommended for Belt rock sites while the expected nutrient status of glacial and alluvial deposits is of lesser concern (Garrison-Johnston et al. 2004 and 2007; Moore et a. 2004a and 2004b). Nevertheless, fine residue (foliage and branches) is allowed to remain throughout the winter within each proposed harvest unit. This allows potassium and other nutrients to leach out of the fine residue and back into the soil where it would be available for future uptake.

As a direct effect, harvesting on all sites would remove within each tree bole (and bark) about 22 percent of the potassium that is contained within a tree (Garrison-Johnston et al. 2004). This may have an indirect affect on some plants that remain in the stand. The commercial removal of Douglas-fir, grand fir, western cedar, and hemlock in association

with leaving western larch would allow the release of stored foliar potassium as a beneficial nutrient for uptake by western larch (Garrison and Moore 1998). Western larch is a more potassium-efficient species (Garrison-Johnston et al. 2007) and would remain throughout those units where it already is part of the stand component. Measuring the effects of on-site productivity, however, cannot be done with certainty until more research information becomes available. At this time, management recommendations from the IFTNC are used as guidelines for maintaining sufficient potassium on a site.

Approximately 7 to 13 tons per acre of coarse woody debris for dry sites and 17 to 33 tons per acre for moist sites would be left after harvest and site-prep operations are completed. This would provide protection against soil erosion as well as a long-term source of nutrients and organic matter (Brown et al. 2003; Graham et al. 1994). The majority of harvest units currently display satisfactory coarse woody debris levels though Units 3, 4, 5, 8, and 15 (moist sites) are presently near the lower end of material.

Indirect effects of soil nutrient loss include reduced growth and yield and increased susceptibility to pathogens, such as root disease (Garrison and Moore 1998; Garrison-Johnston 2003) and insect infestation (Garrison-Johnston 2003; Garrison-Johnston et al. 2004). Precipitation (Stark 1979) and weathering of rocks will continue to make additional nutrients available on site. Annual needle, leaf, and twig fall, forbs, and shrub mortality will continue to recycle nutrients as well.

Effects of soil wood loss include altered processes of forest regeneration and growth, favoring species requiring lower soil moisture and nutrient levels. Additional effects could also include loss of habitat for species requiring soil wood as dens or substrate for invertebrates, bacteria, and fungi, which affect food availability for small rodents and their predators.

5.E Cumulative Effects of Past, Present, and Reasonably Foreseeable Activities

Cumulative effects include the combination of direct and indirect effects from past, present, and reasonably foreseeable activities. Direct, indirect, and cumulative effects on soils are measured within each activity area although adjacent land outside of the activity area is considered as well, primarily in regards to slope stability.

Existing roads and landings designated as classified on the National Forest transportation system are considered dedicated lands. The loss of soil productivity on these sites occurred when the roads and landings were constructed and are an irretrievable effect. These lands are not considered part of the cumulative effects because they are now included as a capital investment to the permanent transportation system.
Spatial Scale **-** the appropriate spatial scale, or geographic bounds, for cumulative effects analysis relates to an area that would be affected by the proposed action. This area is referred to as the cumulative effects analysis area and may vary between resources. The task of selecting the geographical boundaries involves several factors, including the scope of the project considered and the features of the land. Cumulative effects due to physical,

chemical, and biological impacts generally increase with the scope of past and proposed activities (Reid and Hilton 1998).

Since direct and indirect effects from soils are measured within "activity areas," the cumulative effects analysis area for the soils resource consists of the unit scale (activity areas where management activities are proposed) and the immediate surrounding area adjacent to the activity area in regards to slope stability.

***Temporal Scale* -** the temporal scale is dependent on the specific issue being addressed with no one scale being appropriate for all issues. The analysis may need to evaluate the effects of proposed management over all seasons for several days, years, decades, or perhaps centuries. This is complicated by data constraints that require monitoring to detect change – though data are often insufficient to identify even trends or trajectories of change until the impact is large enough or has been occurring for some time. Furthermore, there is often a lag between some action and its observed effect. This analysis strives toward an integrated approach to soil processes and function to project future trends in response to proposed management options to the best of abilities.

Cumulative Effects of Timber Harvest – Past actions contribute to the baseline conditions that provide a foundation for the analysis. The past activities that have contributed to the baseline conditions for soils are described in the appendix and in the affected environment. Walkthrough surveys in the areas proposed for treatment and timber records indicate that regulated timber harvest has occurred in some areas since the 1950s. There is nearly 1500 acres of private land within the 4600 acre project area, much of which has been previously harvested (See Twin Skin EA Appendix C).

Intensive mechanized harvest prior to the 1990s was widespread on public and private land and often highly impacting (Niehoff 2002) with unconstrained tractor skidding, dozer piling or windrowing, and hot burning of slash and burn piles. Skidding was often done on steeper ground and more dispersed than might occur today. No soil restoration occurred and riparian harvest was still the norm until the mid 1990s. Around that time, some controls had been imposed on tractor skid trail spacing, season of use, or riparian harvest, but compaction and displacement still occurred. In general, monitoring over the past two decades (Niehoff 2002; USDA 1998, 1999, 2003, 2004; 2005 and 2006 (draft)) shows a visible trend in soil impact reduction on the IPNF compared to the logging practices of other times.

On National Forest System lands, there are currently no other activities occurring in the project area. Other logging, hauling, fuels reduction activities, and site preparation have been completed within the last few years and include activities from the Thin Skin Timber Sale and Deer Skin Roundwood Timber Sale.

Other than the proposed activities, there is no ongoing or reasonably foreseeable timber harvests proposed on NFS lands in the project area. Salvage opportunities may take place if a wildfire or other storm damage occurs in the project area, following an appropriate analysis. Much of the private land within the project area is by individuals (not private

industrial). Some timber harvest is likely on these lands into the future, as much of it has been managed previously. Timber harvest on private land must follow the rules and Best Management Practices set by the Idaho Forest Practices Act (Title 38, Chapter 13, Idaho Code). Although many of the activities that disturb soil, impair soil productivity, and increase soil water content are site specific, potential contributions to the cumulative conditions are possible because slope instability could affect surrounding NFS lands.

Cumulative Effects of Roads - There are many roads, including 14 miles of Forest System Roads, which provide access to all of the proposed treatment areas. Developed roads built in the past have a lasting effect on soil productivity due to compaction and displacement. Their maintenance for residence access, recreation, and vegetation management calls for ongoing use that result in a considerable amount of compaction and displacement through the project area.

Proposed temporary road construction and existing road re-construction and maintenance may increase short-term sediment movement from road surface runoff initially but should be minimal, especially at road locations higher on the slope that are at a relatively low gradient and provide for sufficient buffer zones. Proposed road maintenance activities, such as blading, culvert installation, and brushing typically improves drainage and decreases erosion from water channeling down the road surface in the long run. For a detailed analysis and information on roads and related issues, see Specialist's Report on Hydrology (Twin Skin EA Appendix B).

Cumulative Effects of Fire – Fires that burned in the early part of the 20th century affected much of the project area, specifically in 1931 when a stand replacing fire burned through treatment units 16, 17, and 18. The affected areas are fully stocked; they are recovering and no observable effects to the soils were found when field data was collected.

Cumulative Effects from Recreation – Disturbance from general motorized use and recreational access has been occurring and will continue throughout the project area indefinitely. No changes in the existing recreation profile are anticipated. Forest use activities that are likely to continue within the project area into the future are firewood gathering, ATV use for recreation including hunting and gathering of forest products, and other miscellaneous activities such as horseback riding. All of these activities have the potential for incidental and dispersed impacts to soils.

Other recreational activities that occur off the developed roads, such as the gathering of miscellaneous forest products and hunting, are generally carried out on foot and have no additional effects on the activity areas.

Cumulative Effects of Noxious Weeds – Noxious weed monitoring and treatment would occur as needed and would follow guidelines established in the Bonners Ferry Noxious Weeds EIS (USDA 1995). Effects to soil resources were analyzed in the document and its adaptive strategy. No additional effects to soils beyond what was analyzed for and disclosed in the EIS are expected to occur.

6. Consistency with Forest Plan and Legal Mandates

The Proposed Action would comply with Forest Plan standards and Regional Soil Quality Standards (USDA 1999) related to detrimentally disturbed soils.

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.

The Proposed Action would comply with this standard; all proposed activity areas are within the acceptable productivity potential for trees and other managed vegetation (see project file). The proposed activities have the potential to disturb a total of 95 acres (Soils Document 005).

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.

The Proposed Action would comply with this standard; large woody debris retention would follow the research guidelines of Graham et al. (1994) to ensure the maintenance of site productivity.

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.

There is no whole-tree logging planned with the Proposed Action.

Region 1 Soil Quality Standards

Detrimental disturbance would not exceed the recommended 15 percent in any of the harvest units where mechanical activity will occur (Table 2). Existing conditions in all 18 harvest units are currently below 15 percent. Mitigation measures, such as winter logging, are put in place to reduce the cumulative detrimental effects from prior disturbance and proposed project implementation. Impacts from project related activities are expected to remain below the 15 percent standard, thus restoration is not required. The proposed activities have the potential to disturb a total of 83 acres (Table 4).

Organic matter layer thickness would be retained as appropriate for local conditions. Large woody debris would be maintained at recommended volumes (Graham et al. 1994) in each proposed activity area.

Other Issue #3 – Aquatics

Issue Indicators:
a. Stream temperature and large woody debris recruitment
b. Sediment delivery
c. Water yield and rain-on-snow events.

A. Watershed Hydrology – Hydrology Specialist Report Follows

Introduction

Proposed Action Overview

The Bonners Ferry Ranger District is proposing the Twin Skin Healthy Forests Restoration Act (HFRA) project which would implement fuels reduction on approximately 713 acres within a project boundary area of approximately 4626 acres, located north of the town of Moyie Springs in Boundary County. This project combines two smaller fuels projects that were in various phases of completion as Categorical Exclusions (Category 10) – the Porkchop and Moyie Mine Hazardous Fuels Reduction Projects. These two projects will now be analyzed as one larger Environmental Analysis under the authority of HFRA.

The project includes a combination of treatments designed to reduce and remove excess fuels and promote a stand structure where intense fire is less likely**.** The project would also help protect the water intake infrastructure from wildfire for the Skin Creek Water Association south of Solomon Lake. Treatments involving commercial timber harvest would be accomplished through a combination of ground-based logging systems (i.e. skidders and hand-felling or mechanical harvesting equipment) and skyline yarding. There would also be approximately 22 acres of precommercial thinning in addition to the commercial harvest activities. These treatments would trend the timber stands towards historical species composition and stocking levels, generally leaving the largest trees available of the desired species mix.

Slash created as a result of treatments will either be underburned or grapple-piled. Where commercial timber harvest occurs an alternative slash disposal method would be to remove the excess slash, at the option of the timber sale purchaser, to utilize this material for biomass energy, biofuels or other uses. If this optional slash treatment were used, the excess slash would be removed concurrently with harvest operations.

It is estimated that up to 1.5 miles of temporary roads may be needed to access fuels in Units 2 and 10. These temporary roads would be obliterated following completion of project related activities.

Forest Plan Direction and other Management Direction

Forest Wide and Management Area direction that are relevant to the Watershed Resource and the proposed action

Goals:

- Maintain High Quality Water to protect fisheries habitat, water based recreation, public water supplies, and be within State water quality standards.

Objectives:

Riparian Areas: Riparian Areas will be managed to feature dependant resources (fish, water quality, maintenance of natural channels, certain vegetation and wildlife communities) while producing other resource outputs at levels compatible for the objective for dependant resources.

Water: Management activities will comply with State Water Quality standards. This will be accomplished through the use of the Best Management Practices. The outcome of these best management practices will be monitored to determine their effectiveness. Water quality that is below Forest Standards will be improved through restoration projects and through the scheduling of timber harvest and road building activities where appropriate.

Standards:

- Management activity 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.
- Maintain concentrations of total sediment or chemical constituents within State standards.
- Implement project level standards and guidelines for water quality contained in the Best Management Practices (Soil and Water Conservation Practices) including those defined by State regulation or agreement between the State and Forest Service such as:
    - Idaho Forest Practices Rule.
    - Rules and Regulations and Minimum Standards for Stream Channel Alterations.
    - Best Management Practices and Road Management Activities.
    - Cooperate with the States to determine the necessary instream flow for various uses. Instream flows should be maintained by acquiring water rights or reservations.

- 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.

  Streams not defined as public water systems, but used by individuals for such purposes, will be managed to the standards stated below or to the fisheries standards whichever is applicable.

Inland Native Fish Strategy

The Inland Native Fish Strategy (INFS) amended Forest Plans with the signing of the INFS decision notice in 1995. The INFS strategy provides direction for the management of fish habitat within the Interior West. Riparian Management Goals, Riparian Management Objectives (RMOs) and standards and guidelines are listed within the INFS Decision document (USDA Forest Service, 1995). Specifically, INFS defines Riparian Habitat Conservation Areas (RHCAs) (special stream management zones, or managed stream buffers). These RHCAs widths are as follows:

Fish Bearing Perennial Streams
- 300 feet on from the edge of both stream channel bank

Non-Fish Bearing Perennial Streams
- 150 feet from the edge of both stream channel banks

Ponds, Lakes, reservoirs, Wetlands greater than 1 acre
- 150 feet from the edge of the riparian vegetation, seasonally saturated soil,

Seasonally flowing or intermittent streams and wetlands less than 1 acre
- 100 feet slope distance

Methodology for Analysis

Water resource and road conditions were determined using aerial photography, GIS data, Water quality information from the Idaho Department of Environmental Quality- Water Quality Division, and field reconnaissance. Landtype descriptions and hazard ratings were gathered from landtype descriptions and characteristics described in the Idaho Panhandle National Forests Land Systems Inventory (USDA Forest Service 1999). Field reconnaissance surveys of the project area were conducted during field seasons (summer) in 2007.

The Watershed Erosion Prediction Project (WEPP) model was used for further analysis with hillslope and road erosion predictions (Elliot, W.J., 2004; Elliot, W.J., 2005). WEPP is designed to assist as a tool to evaluate erosion and sediment delivery potential

from forest roads, harvest activities, prescribed fires, and wildfires, using input values for forest conditions developed by scientists at the Rocky Mountain Research Station (Elliot 1999). WEPP was used to estimate maximum sediment delivery distances used average road slope conditions and a 30-year climate record period. The WEPP results were rounded up to provide for a maximum area of potential stream impacts from road crossings. Estimates of erosion and sedimentation are not considered absolute values, but rather are estimates only for the purpose of comparing alternatives.

Actual erosion and sediment delivery rates would be expected to be lower than the WEPP model ouput figures reflect. This is because the WEPP model does not account for the mitigation measures to control erosion and sedimentation that the Forest Service would implement. Forest Service soil and water conservation practices have been found to greatly reduce impacts to water quality and soil resources (Seyedbagheri 1996). In particular, it does not account for the improvements in road and trail drainage and design features to reduce erosion and sedimentation from the transportation system.

Existing Condition

The project area is located on gentle to moderately steep (5 – 50 percent) mountain slopes. Elevations range from 2040 feet at the south west corner of the project area at the Moyie River to 4201 feet on Solomon Mountain. Overstory vegetation is dominated by moist forest where grand fir, western red cedar, and western hemlock (generally fire intolerant species) have replaced western larch and white pine.

The project is mostly located in the Moyie River in Idaho Watershed (1701010501) 5th level Hydrologic Unit Code (HUC). A small portion of the project area overlies the Kootenai River above Bonners Ferry watershed (1701010403).The affected 6th code HUCs are as follows in the table below:

Table 3. 5th and 6th Code HUCs affected by project activities.

5th Code HUC	1701010503- Moyie Rver in Idaho		1701010403- Kootenai River abv. Bonners Ferry
5th Code HUC Acres	97098		68577
6th Code HUC #	170101050306	170101050308	170101040302
6th Code HUC Name	Lower Moyie River	Deer Creek	Kootenai River abv. Dobson Creek
Total HUC Acres	19588	19705	16418
Project Area Acres within 6th Code HUC	3824	394	26
Proposed Treatment Acres within 6th Code HUC	759	34	12

There are 5.0 miles of streams within or immediately adjacent to the project- 3.6 miles of perennial streams and 1.44 miles of intermittent streams. There is an additional 5.22 miles of the Moyie River that is immediately adjacent to the project area. Skin Creek, Deer Creek and Solomon Creek are all perennial. The stream running through private property in section 30 is intermittent. Stream segments of Deer Creek, Skin Creek and Solomon Creek have near-stream vegetation is that is abundant. All stream segments that were visited during field reviews in June of 2007 appear to be relatively stable.

All streams and the Moyie River are located outside of project activity units. The Beneficial Uses associated with the Moyie River- Meadow Creek to Moyie Falls Dam, are Cold Water Aquatic Life, Domestic Water Supply, Primary Contact Recreation, and Salmonid Spawning. The Beneficial Uses associated with all other affected streams within the project area are- Primary Contact Recreation, Cold Water Aquatic Life, and Salmonid Spawning. The segments of Deer Creek, including Solomon Creek, (ID17010105PN004_03), Skin Creek (ID17010105PN003_02), and Moyie River (Meadow Creek confluence to Moyie Falls Dam) (ID17010105PN002_02) are all listed with the Idaho Department of Environmental Quality as not meeting Beneficial Uses (IDEQ, 2002). The IDEQ 2002 305(b) report to Congress indicates that these stream segments are listed as having water temperature modifications that are affecting Beneficial Uses for Cold Water Habitat, and Salmonid Spawning. The pollutant of concern is Thermal Modification of water temperatures.

Solomon Lake (10.8 acres) is also within the project boundary. It is over 3000 feet from the nearest project activity units- and easily outside the 150 feet buffer required by the Inland Native Fish Strategy (INFS). There are designated wetland areas within and immediately adjacent to project boundaries, but no activity units are located on or near wetland areas. There is one seep associated with the pond located in the southwest corner of the project area near Moyie Mine.

Road systems within the project area are generally in a stable condition. Most of the roads are on relatively gentle grades and do not appear to be substantially affecting streams at road crossings on Skin Creek and Solomon Creek. An estimated 14 miles of maintenance work would occur on road segments 435, 435UF, 2215, 2215A, 2215B, 2269, 2533, 2404A, 2549, 2584, 2584U, 2549UE and 627. This work would include brushing, blading, ditchline cleaning and shaping, and spot graveling for the project. Several relief culverts need maintenance or upgrading, but none are directly impacting stream channels.

The Lower Moyie River 6th code HUC watershed encompasses 680 acres of the total 713 acres of the total treatment area. The watershed has a drainage area of 19,507 acres and watershed sensitivity is low- the watershed is fairly resilient to disturbance activities or events which generally relates to the amount of sensitive soils within the watershed. Disturbance within riparian areas is low due to the number of road crossings, logging on private lands, and residential development. The overall watershed disturbance is moderate due to the relative ratio of the spatial area of disturbance activities within the watershed versus the amount of land in hydrologically functioning condition. The watershed has an ECA (Equivalent Clearcut Area) of approximately 20%- ECA

percentages above 25% are generally considered to be over threshold. Watersheds with ECA values in excess of 25% are often considered to be at risk for accelerated erosion, altered stream flows, and stream channel degradation. In this case, the moderately high ECA value is tempered by the relatively low amount of sensitive soils and the vegetative regeneration capacity of the watershed. The average annual precipitation is 24 inches. Twenty five percent of the watershed is in the sensitive snow zone- meaning 25 percent of the watershed lies within elevation bands which are prone to rain-on-snow runoff events. Twelve percent of the watershed is in a sensitive landtype (prone to accelerated erosion and/or compaction). The Lower Moyie River Watershed is currently functioning-at-risk.

Although the Deer Creek and Kootenai River above Dobson Creek watersheds are also overlain by the project boundary (394 acres and 409 acres respectively), they play a fairly minor role in terms of project related effects to these watersheds. The actual amount of acreage in activity units within these two watersheds is small (22 acres for Deer Creek and 12 acres for Kootenai River above Dobson Creek) (and will be discussed below in Direct and Indirect Effects), so the discussion regarding these watersheds will be brief.

Deer Creek watershed has a drainage area of 26 mi^2 and is in generally good condition. There have been relatively few past harvest activities, roads constructed, or residential developments as compared to nearby watersheds. The watershed sensitivity is low indicating that the watershed is relatively resilient to disturbances. Riparian disturbance is low indicating that there are not a lot of road crossings, logging on private lands, and residential development which is affecting riparian zones. Watershed disturbance is also low- most notably due to the low aereal extent of sensitive soils.

The Kootenai River watershed has experienced much more resource management and development activities than the other watersheds. The watershed sensitivity is low indicating that the watershed is relatively resilient to disturbances. Riparian disturbance is high indicating that there are a lot of road crossings, logging on private lands, agricultural use, and residential development which is affecting riparian zones. Watershed disturbance is also high- most notably due to the high aereal extent of land use within the watershed.

Environmental Consequences

Issues/Concerns:

The issues and concerns regarding water resources for this project are:

- Water Quality
    - Further impacts to nearby 303(d) listed streams through changes in stream temperature or sediment delivery
- Impacts to stream channels and fish habitat through changes in in-channel large woody debris and stream channel shade

- Water yield.

Proposed Action

Proposed treatments developed through collaborative meetings include reducing live and dead ladder and down fuels through a combination of:

- Shelterwood and Irregular Shelterwood
- Uneven-aged management-group selection and free selection
- Intermediate treatments- commercial thin/sanitation salvage and improvement cut/weed and release

Specific unit by unit treatment proposals are as follows:

- Irregular Shelterwood (Unit 15) = 34 acres
- Shelterwood (Units 4 and 5) = 17 acres
- Free Selection (Units 1, 3, 6 and 8) = 187 acres
- Group Selection / Commercial Thin (Units 9 and 10) = 80 acres
- Commercial Thin / Sanitation Salvage (Units 2, 7, 14, 16, 17, 18) = 273 acres
- Weed and Release / Improvement Cut (Units 11, 12, 13) = 100 acres
- Precommercial Thin = 22 acres

Post harvest fuel treatments would occur as follows:

- Grapple Pile/Biomass Removal (Units 1-5, 8)
- Grapple Pile where necessary (Units 11 – 15)
- Underburn (Units 9, 10)
- Grapple Pile/Underburn (Units 7, 16, 17, 18)

As mentioned, up to 1.5 miles of temporary roads may be needed to access fuels in Units 2 and 10. These temporary roads would be obliterated following completion of project related activities.

Connected Actions

In addition to the activities listed above, the following activities would also take place:

1) In the event that incidental residual tree mortality occurs after completion of the project as a result of windstorms, ice-damage, fire, insects or disease in the treatment areas and associated roadsides used for hauling, salvage may occur using the existing skid trails and landings while adhering to design criteria established for this project.

2) Noxious weed treatments have been occurring and will continue in the future in and around the project area as authorized through the Bonners Ferry Ranger District

Noxious Weed Management Projects FEIS (September 1995). Noxious weed treatments could be funded by this project through Knutson-Vandenberg (KV) deposits or made a contractual requirement during implementation of this project. The treatments could occur anywhere within the project area that the district noxious weeds program manager determines the need and as funding becomes available.

Direct and Indirect Effects

There would be no direct or indirect effects to water quality, stream channels, lakes, or wetlands resulting from this project. There are no streams within project activity units and stream channels adjacent to the project activity units are far enough away that effects to stream temperature and sediment delivery are unlikely. The major water quality concerns regarding this project are the effects to stream temperatures in the Moyie River, Deer Creek, and Skin Creek which are all located adjacent to project activities in the project area. Sedimentation, and effects to water yield are also concerns, but to a much lesser extent due to the relatively small total acreage and spatial extent of project activities.

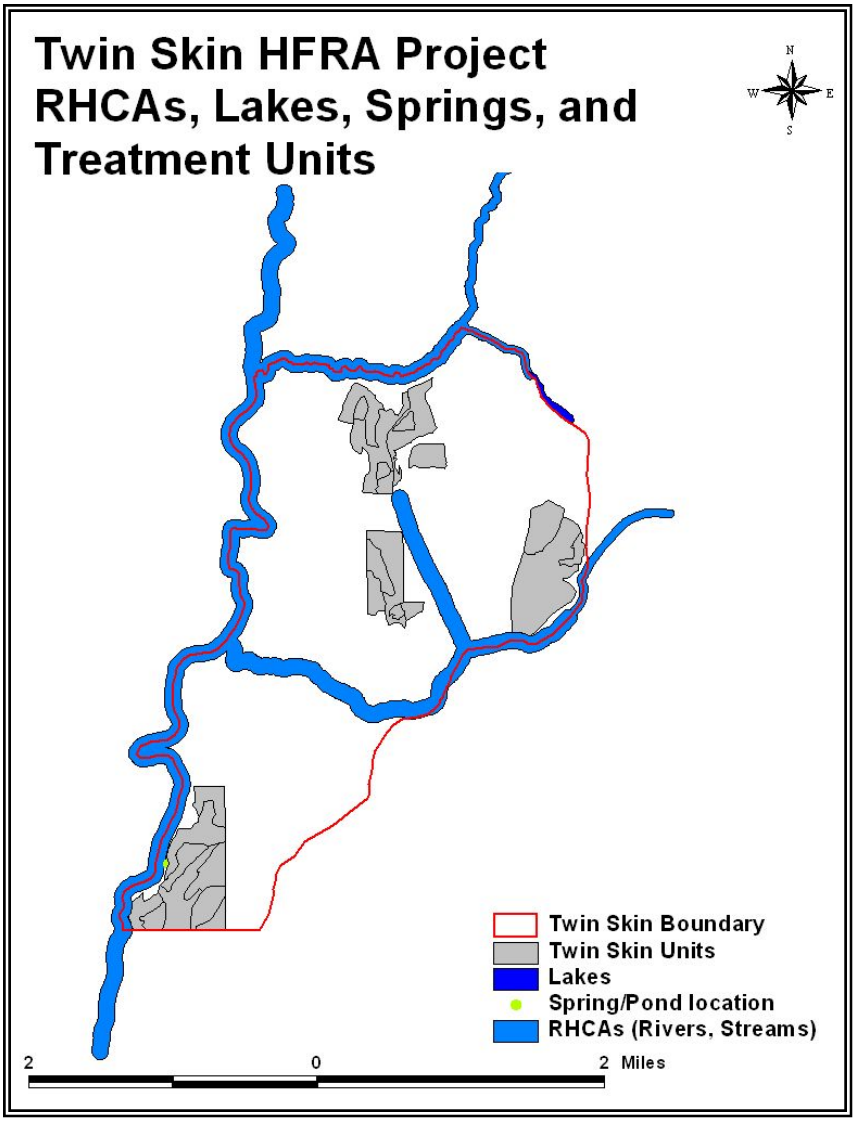

Figure 1. Twin Skin Project. Treatment Units in relation to rivers, streams, lakes, and known seeps.

As noted above (*See Figure 1*), the project will utilize 300 foot stream buffers on perennial streams, 150 foot buffers on intermittent streams, 150 foot buffers on all lakes greater than 1 acre. There are no activity units that overlay RHCA areas. Therefore, no treatments would occur within RHCAs. So it is not expected that the project would have any influence on near term water temperatures for any of the aforementioned streams. The likelihood that any tree providing shade to a perennial channel would be affected by project activities is very remote and would not be of any frequency that would affect stream temperatures.

Any potential for sediment derived project activities would come from road use and would most likely come from use of FS Rd 2549, 627, 2269 and 2269A, and 2534. The activity units all have enough of stream buffer that WEPP modeling indicates that there is a very low risk for sediment delivery. Further, WEPP modeling indicates that sediment delivery from road maintenance and use activities on those roads would be negligible. In all modeled scenarios, sediment delivery was 1/10th of a ton or less annually for each of these roads. These are amounts that are well within the variation of natural sediment inputs and would not be differentiable from natural or project caused sedimentation. Further, it is expected that the implementation of Soil and Water Conservation Practices (SWCPs) (also known as Best Management Practices or BMPs) would prevent the delivery of the any sediment generated from roading activities. Several studies have found BMPs and site specific project design features to be effective in controlling impacts from forest management activities to water quality and stream habitats (Megahan et al, 1992; Seyedbagheri , 1996). The specific BMPs which apply to this project are SWCP 15.21 - Maintenance of Roads, 15.23 - Traffic Control During Wet Periods, and 15.25 - Obliteration of Temporary Roads (USDA, 1988).

Timber harvest that removes a large portion of the forest canopy may lead to increased peak flows because the trees are not present to intercept rain or snow, and fewer trees are using water from the soils in a process called transpiration. Opening the canopy of a forest can result in higher peak flows occurring earlier in the season whereas, base flows are sometimes reduced. Therefore there is the potential that total water yield could be increased (Benoit, 1973). However, it is not expected that increases in peak flows or annual water yield related to project activity effects would occur. This is mainly due to the relatively low acreage of the project activity units, the spatial extent of the activity units, and protection of soil infiltration/runoff characteristics (*See Table 2*).

Table 2. Watershed areas in relation to project acres and treatment unit acres.

Watershed	Watershed Area (acres)	Project acres	% of Watershed	Unit Acres	% of Watershed
Lower Moyie River	19588	3824	20%	759	3.87%
Deer Creek	19705	394	2%	34	0.17%
Kootenai River Above Dobson Creek	16418	409	2%	12	0.07%

Equivalent Clearcut Area percentages would not be measurably affected by implementing the project. Changes are less than 1 % ECA for all watersheds. Tractor units will provide for the most canopy removal leading to this percentage (leaving an average of 3 – 8 reserve trees for shelterwood cuts, and approximately 50 percent of the current stand in all other treatments). Skyline units will typically leave approximately 50 percent of the current stand density. Therefore, canopy cover will be reduce over much of the activity units- especially in the tractor units, so there is potential for some effects(i.e. very localized and short term increases in peak flows and overland flow) in severe weather conditions (rain-on-snow events, severe floods, tornados, etc.), although the risk is minimal. These effects would be virtually immeasurable compared to the watershed response under background natural conditions. The reason for this is that the project area is relatively small as compared to the size of the watersheds it overlays, and it is not expected that the project will have an effect on infiltration runoff characteristics in activity units. The units are also spread out spatially over the landscape which further diffuses any potential for concentrating project related runoff and increasing downstream channel erosion. So the effects of a severe weather occurrence would be minimal in terms of water quality, impacts to stream channel form and function, or fish habitat.

Noxious weed treatments would not occur within RHCAs and any weed treatments that would occur will be far enough away from stream channels so that impacts to water quality would be prevented. Stream and lake buffer distances are sufficient to preclude the introduction of noxious weed eradication chemicals into streams and lakes. Standard BMPs for noxious weed use would be implemented to prevent application of these materials when weather or other environmental conditions are such that chemicals could be transported to a waterbody.

In summary, the project is very unlikely to produce negative effects through sedimentation, increased stream temperatures, changes in water yield, or decreased amounts of large wood for stream channel stability.

Cumulative Effects

The cumulative effects area for this project is described as those 6th code HUC watersheds which the project overlies. These watersheds include Lower Moyie River, Deer Creek, and Kootenai River above Bonners Ferry (*See Figure 2*). Past and present

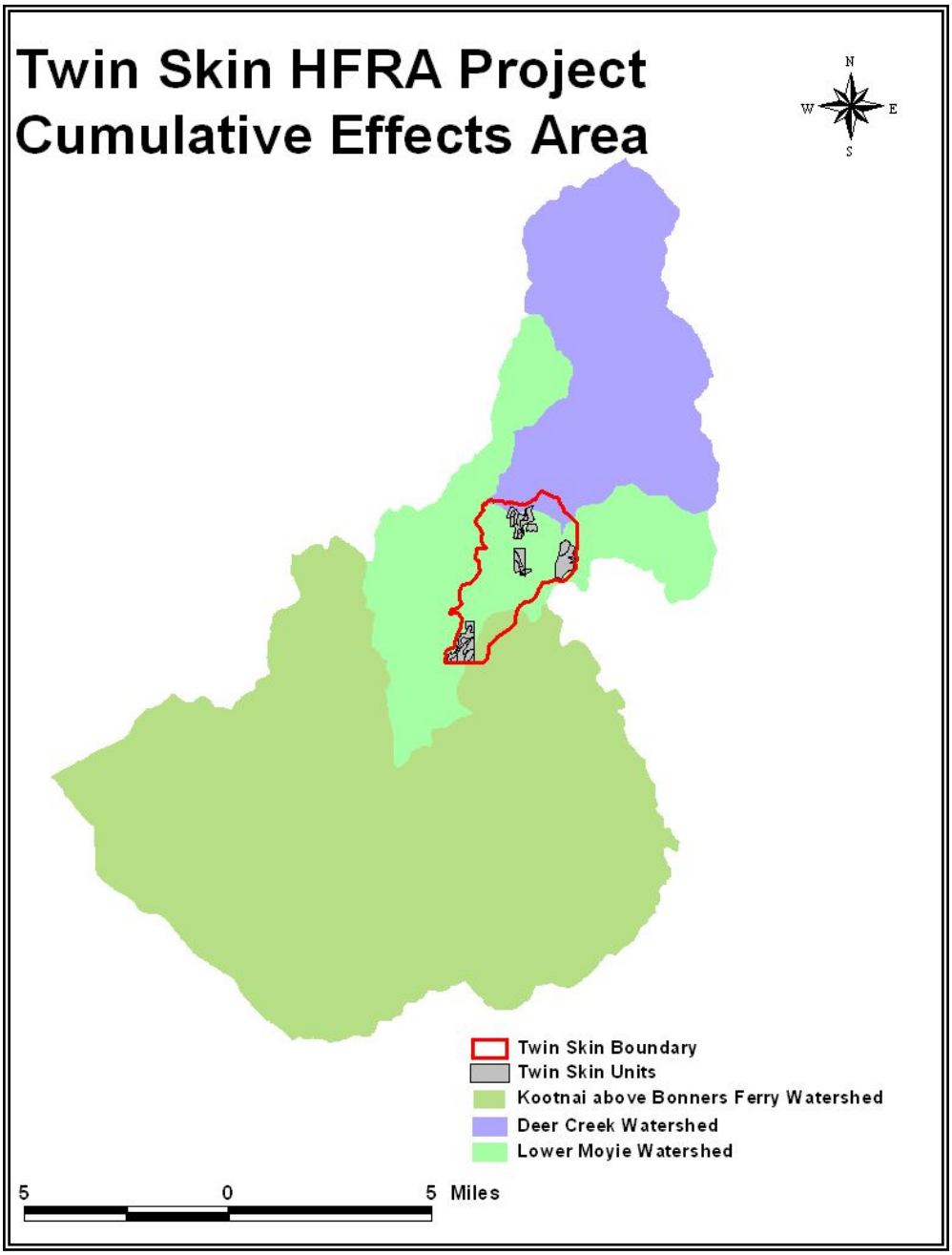

Figure 2. Twin Skin Cumulative Effects Area.

projects in or near the Twin Skin HFRA Project include timber harvest, road building, noxious weed treatments, firewood gathering, and dispersed recreation. There are some

private residences adjacent to the cumulative effects area, but they were not included in the analysis as they fall outside of the cumulative effects hydrologic watershed boundary.

Past activities

Table 3. Past activities in the Twin Skin Project Area – 4600 total acres

Agency/Entity	Use Category	Action/Activity	Specifics
American Indian Tribes	Traditional Uses	Hunting, gathering and other activities such as landscape burning	Hunting of game and fish, gathering of natural resources and religious practices according to Tribal customs
All	Transportation	Road Construction, Maintenance, Use	Roads for logging and settlement since 1800's
All	Property/resource protection	Fire Suppression	Past 100+ years
All	Resource Use	Logging, Hunting, Fishing	Fuelwood, home construction, logging, food, commerce and recreation 1800's - 1930's
All	Resource Use	Logging, Mining	Skin Creek log flume and chute construction and use late 1800s through approximately the 1930s
Private	Settlement	Residential development past 100+ years	Adjacent to and surrounding USFS project area
USFS	Veg management	Fire Salvage	Approximately 1930's
USFS	Veg management	Fire Salvage, Firewood cutting	Approximately 1940's
USFS	Veg management	Salvage and Liberation Cuts	1965
USFS	Veg management	Seed-tree, Liberation cut, and Patch clearcutting	Lookout Sale – Late 1970s through mid-1980s
USFS	Veg management	Seed-tree and Liberation Cuts	Stinger Road 1983
USFS	Veg management	Seed-tree final removal	Four Corners – 1986
USFS	Veg management	Patch Clearcutting, Liberation cut, Commercial thin, etc.	Skin-Perkins-Goat – Late 1980s – early 1990s
USFS	Veg management	Seed-tree/Improvement	Skin Creek – 1991
USFS	Veg management	Sanitation Salvage	Deer-Placer-WP – 1992
USFS	Veg management	Timber Sale and Reforestation	Moyie Mine 1990-1991
USFS	Veg management	Salvage Cut	Big Aspen, Porkmoy, Bennett Posts 1998
USFS	Veg management	Timber Sale and Reforestation	Deerskin Roundwood 2003 & 2004
USFS	Veg management	Timber Sale and Reforestation	Thin Skin – 2000 & 2001
Private	Veg management and residential	Logging	Various logging on state and private lands adjacent to USFS project area,

	development		including residential development, past 3-5 years
All	Resource management	Invasive Weed Treatments, chemical and biological	Noxious weed treatments along state, county, federal and private roadsides and property, approx past 20 years.

Table 4. FACTS Activities for Cumulative Effects Analysis for entire Lower Moyie River Watershed (19,587 acres) and portions of Twin Skin HFRA project area within the Kootenai River above Bonners Ferry Watershed (409 acres) and the Deer Creek Watershed (394 acres) – Total area equals 20,392 acres.

USFS	Veg management	Seed-tree, Liberation cut, and Patch clearcutting	Lookout Sale – Late 1970s through mid-1980s: 310 Acres
USFS	Veg management	Intermediate - Sanitation Salvage	Placer Creek One 1978: 56 Acres
USFS	Veg management	Seed Tree	Dawson Ridge 1976-1982: 146 Acres
USFS	Veg management	Intermediate - Sanitation Salvage	Placer Post 1981: 27 Acres
USFS	Veg management	Various Timber Sale Activities	Spread Dawson early 1980s: 211 Acres
USFS	Veg management	Commercial Thin	Bull Pine Flat 1983: 58 Acres
USFS	Veg management	Seed-tree and Liberation Cuts	Stinger Road 1983: 68 Acres
USFS	Veg management	Seed-tree final removal	Four Corners – 1986: 98 Acres
USFS	Veg management	Seed Tree	Eileen Sale 1986: 15 Acres
USFS	Veg management		Placer Creek Two 1988: 114
USFS	Veg management	Patch Clearcutting, Liberation cut, Commercial thin, etc.	Skin-Perkins-Goat – Late 1980s – early 1990s: 125 Acres
USFS	Veg management	Stand Clearcut	3 Corners 1988: 155 Acres
USFS	Veg management	Overstory Removal	Dawson OSR 1990: 328 Acres
USFS	Veg management	Seed-tree/Improvement	Skin Creek – 1991: 30 Acres
USFS	Veg management	Intermediate - Sanitation Salvage	Deer-Placer-WP – 1992: 236 acres
USFS	Veg management	Shelterwood	Radar Ridge 1992: 221
USFS	Veg management	Timber Sale and Reforestation	Moyie Mine 1990-1991: 112 Acres
USFS	Veg management	Thinning	Complacer C 1996: 171 Acres
USFS	Veg management	Intermediate -Salvage Cut	Big Aspen, Porkmoy, Bennett Posts, Plastered See 1998: 64 Acres
USFS	Veg management	Intermediate - Sanitation Salvage	Too Too Blowdown; UN2U; Yellow Belly 1998: 72 Acres

USFS	Veg management	Intermediate – Salvage Cut	8 Moyeah Blowdown 1998: 4 Acres
USFS	Veg management	Intermediate – Salvage Cut	Ten Moyeah Blowdown 1998: 39 Acres
USFS	Veg management	Timber Sale and Reforestation	Deerskin Roundwood 2003 & 2004: 115 Acres
USFS	Veg management	Timber Sale and Reforestation	Thin Skin – 2000 & 2001: 700 Acres
USFS	Veg management	Commercial Thin	Solomon's Wood 2003: 150 Acres

Outside of the project area there is an assortment of land ownerships including public Forest Service administered lands, private lands in forested settings utilized for residential use and commercial timber harvest, private lands in agricultural settings utilized for pastures and crop production, The range of activities associated and within this cumulative effects area includes home construction, road building and maintenance, forest silvicultural activities (thinning, harvesting, and planting), and dispersed recreation.

Reasonably foreseeable future actions include continued use of the transportation system, fuelwood and food gathering, recreation, possible wildfire suppression, fish and wildlife management, noxious weed treatments and incidental salvage following the project. Overall, there is a substantial amount past, current land use activity within the cumulative effects area.

However, it is not anticipated that there would be any cumulative effects to watershed resources resulting from this project. There are no expected direct or indirect effects to watershed resources within the project area. Since there are no expected direct or indirect effects to watershed resources, it is also anticipated that there would not be any measurable cumulative effects resulting from the implementation of the project.

Compliance with the Forest Plan and Other Regulatory Direction

Forest Plan Consistency:

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.

Idaho State Best Management Practices (BMPs) are designed to protect the long-term productivity of the water resource and ensure state water quality standards will be met. The Twin Skin project will meet standard BMPs (USDA, 1988). Site-specific BMPs were also included with this project as mitigation measures to improve water quality. Please see paragraph above.

2. Maintain concentrations of total sediment or chemical constituents within state standards.

The net production and delivery of sediment from the proposed management activities is expected to decrease by implementing the road reconstruction and maintenance. Petroleum products used in the operation and maintenance of heavy equipment are the primary chemical constituents which could be delivered to streams. The proposed management activities would meet State standards for chemical constituents given that "Required Design Criteria", State and site-specific BMPs, and INFS standards would be applied for the project.

3. Implement project level standards and guidelines for water quality contained in the Best Management Practices.

Specified road reconstruction is needed for this project to be consistent with Idaho Forest Practices Rules. In addition to standard State BMPs, other soil and water conservation practices that are approved BMPs are built into the timber sale contract. Site specific Required Design Criteria and BMPs are specified and are listed in this report. Soil and water conservation principles were used during design to determine the location and types of treatments including which areas should be avoided or restored. The specified and designed measures meet those required by the State Forest Practices Act and are consistent with Forest Service standards. Stream crossing upgrades would meet minimum standards for stream channel alterations and are covered under a Memorandum of Understanding with the State of Idaho.

5. Manage public water system plans for multiple uses by balancing present and future resources with public water supply needs.

Streams not defined as public water systems, but used by individuals for such purposes, such as the Skin Creek Water Association in Skin Creek, will be managed to standards established by the state's forest practices rules and/or the National Forests' BMPs or to the

fisheries standards whichever is applicable. State and site-specific standards and INFS standards are specified and would be applied. Factors that put water quality at-risk were identified as well as what can be done to minimize or eliminate those risks.

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 and riparian guidelines will be used to accomplish this objective. Protection of the integrity of riparian conservation areas (which includes first and second order streams) was approached through project design strategies and specified actions in the BMPs.

Executive Order 11990 & Executive Order 11988

This project meets the requirements of Executive Orders 11990and 11988, which apply to protection of wetland and floodplains. Executive Order 11990 requires that federal agencies follow avoidance, mitigation, and preservation procedures with public input before proposing new construction in wetlands. Executive Order 11998 requires all federal agencies to take actions to reduce the risk of flood loss, restore and preserve the natural and beneficial values in floodplains, and minimize the impacts of floods on human safety, health, and welfare. These features are protected through implementation of BMPS and Forest Plan Standards and Guidelines. The riparian protection components of the project (INFS RMOs, Forest Service BMPs) are designed to improve condition of riparian areas (including wetlands) and floodplain function.

CWA regulations, state water quality regulations

The proposed project will be consistent with the requirements of the Clean Water Act, 33 U.S.C. 1251. The objective of the Act is to restore and maintain the chemical, physical and biological integrity of the Nation's waters. (Section 101(a)). It also regulates discharge of dredged or fill material into navigable waters (waters of the U.S.) (Section 404). The Forest Service abides by the Clean Water Act through the implementation of Best Management Practices (BMPs) otherwise know as Soil and Water Conservation Practices within the Forest Service. The Soil and Water Conservation Practices Handbook (FSH 2509.22) was developed in concert between the USDA Forest Service, Southwestern Region and both Departments of Environmental Quality from Arizona and New Mexico. It is a formalized agreement with the specific purpose to respond to the objectives defined by Congress in the Federal Water Pollution Control Act, as amended. The main objective of this law is to restore and maintain the chemical, physical, and biological integrity of the Nation's water. Sediment and water temperature, the pollutants of concern, will not permanently increase in the waters of the Twin Skin Project. These pollutants to water quality will be prevented through implementation of BMPS and Forest Plan Standards and Guidelines. The riparian protection components of the project (INFS RMOs, Forest Service BMPs) are designed to improve condition. Risks to beneficial uses

will not be changed by this project. There will be no detrimental increase in sediment or stream temperature through management activities in the Twin Skin Project Area.

Water Quality Limited Stream Segments

By following site specific BMPs, INFS guidelines, and RHCA buffers, there will be no detrimental cumulative effects to the streams, or net increase in siltation, suspended solids, or thermal modifications, thus no violation to the TMDL regulations or Clean Water Act. Please see Fisheries Report for more information regarding temperature concerns.

Designated Beneficial Uses

By following the above BMPs, required design features and design recommendations, and adhering to the above laws and regulations, designated beneficial uses will be maintained.

Army Corp Discharge, Dredge and Fill Permits

The proposed harvesting and road reconstruction will not detrimentally affect wetlands or streams. The proposed stream crossings upgrades recommended are covered under the "silvicultural road exemption" of the nationwide permit.

B. Fisheries Resource – Fish Biologist Report Follows

Introduction

Proposed Action

Proposed treatments developed through collaborative meetings include reducing live and dead ladder and down fuels through a combination of:

- Shelterwood and Irregular Shelterwood
- Uneven-aged management-group selection and free selection
- Intermediate treatments- commercial thin/sanitation salvage and cut/weed and release

Specific unit by unit treatment proposals are as follows:

- Irregular Shelterwood (Unit 15) = 34 acres
- Shelterwood (Units 4 and 5) = 17 acres
- Free Selection (Units 1, 3, 6 and 8) = 187 acres
- Group Selection / Commercial Thin (Units 9 and 10) = 80 acres
- Commercial Thin / Sanitation Salvage (Units 2, 7, 14, 16, 17, 18) = 273 acres
- Weed and Release / Improvement Cut (Units 11, 12, 13) = 100 acres
- Precommercial Thin = 22 acres

Post harvest fuel treatments would occur as follows:

- Grapple Pile/Biomass Removal (Units 1-5, 8)
- Grapple Pile where necessary (Units 11 – 15)
- Underburn (Units 9, 10)
- Grapple Pile/Underburn (Units 7, 16, 17, 18)

It is estimated that up to 1.5 miles of temporary roads may be needed to access Units 2 and 10. These temporary roads would be obliterated following completion of project related activities

Connected Actions

In addition to the activities listed above, the following activities would also take place:

1) In the event that incidental residual tree mortality occurs after completion of the project as a result of windstorms, ice-damage, fire, insects or disease in the treatment areas and associated roadsides used for hauling, salvage may occur using the existing skid trails and landings while adhering to design criteria established for this project.

2) Noxious weed treatments have been occurring and will continue in the future in and around the project area as authorized through the Bonners Ferry Ranger District Noxious Weed Management Projects FEIS (September 1995). Noxious weed treatments could be funded by this project through Knutson-Vandenberg (KV) deposits or made a

contractual requirement during implementation of this project. The treatments could occur anywhere within the project area that the district noxious weeds program manager determines the need and as funding becomes available.

Regulatory Framework

The principle regulatory direction applicable to the management of the fisheries resources on the Idaho Panhandle National Forests (IPNF) include:

- The Endangered Species Act of 1973 (ESA), as amended
- National Forest Management Act of 1976 (NFMA)
- Idaho Panhandle National Forests Forest Plan (USDA Forest Service 1987)
- Rules Pertaining to the Idaho Forest Practices Act (Title 38, Chapter 13, Idaho Code, 2000)
- Executive Order 12962 (Recreational Fishing)
- State of Idaho Governor's Bull Trout Plan

The National Forest Management Act of 1976 (NFMA) requires that the Forest Service provide for diversity of plant and animal communities" in the Plan area (16 USC §1604 NFMA §6 (g)(2) (B)) Direction is also included in the Idaho Panhandle National Forests Forest Plan (USDA Forest Service 1987). The Inland Native Fish Strategy (INFS; USDA Forest Service 1995) amended some Forest Plan direction regarding stream and fish habitat protections measures.

Section 7 of the 1973 Endangered Species Act (ESA) includes direction that Federal agencies, in consultation with the U.S. Fish and Wildlife Service, will not authorize, fund, or conduct actions that are likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitat.

The Forest Service has agreements with the State to implement best management practices (BMPs) or soil and water conservation practices for all management activities. Proposed activities will comply with the guidelines in the Soil and Water Conservation Handbook (Forest Service Manual 2509.22), which outlines best management practices that meet the intent of the water quality protection elements of the Idaho Forest Practices Act.

Executive Order 12962 (June 7, 1995) states objectives "to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities by: (h) evaluating the effects of Federally funded, permitted, or authorized actions on aquatic systems and recreational fisheries and document those effects relative to the purpose of this order."

The mission of the Governor's Bull Trout Plan is to "…maintain and or restore complex interacting groups of bull trout populations throughout their native range in Idaho" (State of Idaho 1996). Through a process involving state and federal agencies, interested groups and individuals (i.e., Basin Advisory Groups, Watershed Advisory Groups, Technical

Advisory Teams), a "problem assessment" was prepared (Panhandle Bull Trout Technical Advisory Team; PBTTAT 1998) and a conservation plan was developed (Resource Planning Unlimited 1999) for the Lake Pend Oreille key watershed**.**

Analysis Methods

Information for the fisheries analysis was gathered from district fish and hydrology files, historical records and published scientific literature. Species surveys were conducted for some species, where relevant and applicable, to determine presence. However, surveys do not necessarily determine absence of a species. Therefore, a more meaningful and creditable approach in conducting an analysis is to assume presence based on the attributes of a particular stream, using survey information to help validate suitability of streams. In some cases, surveys can identify key habitats (e.g., spawning sites) that can be further protected through design features.

Cumulative Effects Analysis Area

The appropriate scale or geographic bounds for cumulative effects analysis relates to an area that would be affected by the proposed action or reasonable alternative. This area is referred to as the cumulative effects analysis area and may vary between resources. The task of selecting the geographical boundaries involved several factors, including the scope of the project considered, the features of the land, species' distribution, and range in relation to available habitat and points of diminishing effects.

The cumulative effects area for this project is described as those 6th code HUC watersheds which the project overlies. These watersheds include Lower Moyie River, Deer Creek, and Kootenai River above Bonners Ferry. The boundaries of the cumulative effects analysis area are drawn along natural topographic features, which comprise watershed delineations. Refer to figure 2 in the hydrology analysis for a map of the cumulative effects area.

Affected Environment

Species Screen

The Council on Environmental Quality (40 CFR 1502.2) directs that impacts be discussed in proportion to their significance. Some fish species require a detailed analysis/discussion to determine effects of an action on them. Other fish species may not be impacted or impacted at a level that does not increase risk to the species. Some species may be adequately protected through altering the project design. Generally, these species do not require a detailed discussion and analysis.

The appropriate methodology and level of analysis needed to determine potential effects are influenced by a number of variables including presence of a species or its habitat, the scope and nature of the activities associated with the proposed action and alternatives, and the risk to factors that could ultimately result in a meaningful adverse or favorable effect. The screening process includes the review and use of the following documents and

uses a variety of information including scientific literature, resource inventories and sighting records:

- Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin (Quigley and Arbelbide 1997)
- Idaho Panhandle National Forest Land and Resource Management Plan (1987)
- Conservation Assessments and Strategies for fish species

Species Not Analyzed in Detail

A preliminary analysis was conducted for each potentially affected fish species and their habitat to determine the scope of analysis. The species listed in Table 1 would not likely be affected by the proposed activities because they do not have suitable habitat, are not regularly present, are not expected to be in streams within the project area or the species would not be impacted, impacted at a level that does not pose a risk to the species or potential impacts would be adequately mitigated by altering the project design. For these reasons, these species were not analyzed in detail.

Table 1. Fisheries species not analyzed in detail

Species	Status	Rationale for Elimination from Detailed Analysis	Preferred Habitat
White sturgeon *Acipenser transmontanus*	Endangered	No suitable habitat is present within the analysis area. The analysis area is outside recognized sturgeon habitat.	Large lakes and rivers. In Idaho, found only in the Kootenai River System
Bull trout *Salvelinus confluentus*	Threatened	Bull trout are thought to have historically inhabited the Moyie River watershed. Only the mainstem Kootenai River was designated Critical Habitat for bull trout on the Bonner Ferry Ranger District. Redd surveys conducted by Idaho Department of Fish and Game in 2000/2001 failed to find any bull trout redds in the Moyie River (Walters 2002, IDFG unpubl).	Cold, clear streams with gravel/cobble substrate for spawning and lots of deep pools
Burbot *Lota lota*	Sensitive	No suitable habitat is present within the analysis area. The analysis area is outside recognized Burbot habitat.	Large lakes and rivers. In Idaho, found only in the Kootenai River System
Interior Redband Trout *Oncorhynchus mykiss gairdneri*	Sensitive	Interior redband trout are found only in isolated tributaries to the Kootenai River, however	Cool, clean, relatively low gradient streams. On the IPNF, found only in isolated tributaries of

		they are not known to inhabit the Moyie River drainage (Baconrind Pers. Comm.)	the Kootenai River

Species Analyzed in Detail

Species Habitats and Requirements

This section describes the status and distribution of fish species analyzed in detail that have been identified as species of concern within the project area and could potentially be affected by proposed activities (Table 2). It also describes the environmental baseline and relevant habitat components that may or may not be affected by the alternatives, if they were to be implemented. Information presented in this section is based on scientific literature, fisheries databases and professional judgment.

Table 2. Fisheries species analyzed detail.

Species	Status	Rationale for Detailed Analysis	Preferred Habitat
Westslope Cutthroat *Oncorhynchus clarki lewisi*	Sensitive	Westslope cutthroat trout are known to reside in the Moyie River.	Cold, clear streams with rocky, silt-free riffles for spawning and deep pools for feeding and resting

Westslope Cutthroat Trout

Westslope cutthroat trout are listed as "sensitive" by Region 1 of the USDA Forest Service and are listed as "species of special concern" by the State of Idaho. However, in 2000 the U.S. Fish and Wildlife Service determined that westslope cutthroat trout did not warrant listing as a threatened or endangered species (USDI Fish and Wildlife Service 2000). In 2003, the U.S. Fish and Wildlife Service reconsidered the listing of westslope cutthroat trout and again determined that their listing was not warranted (USDI Fish and Wildlife Service 2003).

A population status review of westslope cutthroat trout in Idaho has determined that populations in northern Idaho have declined (Shepard etal 2003). However, they currently occupy over 18,000 stream miles in Idaho, which is approximately 95 percent of their historical distribution (Shepard etal 2003). Rieman and Apperson (1989) also concluded that populations of westslope cutthroat trout in northern Idaho have declined, but they estimated that there were viable populations existing in only approximately 36 percent of their historical Idaho range. Shepard etal (2003) concluded that the discrepancy between the two assessments is likely due to differences in the mapping scales used, the response of some westslope cutthroat trout populations to protective measures, the inclusion of new information and that earlier assessments were made during drought conditions without the benefit of long-term data. Within the analysis area, westslope cutthroat trout have been identified in the Moyie River.

Habitat Requirements - The preferred habitat of westslope cutthroat trout is cold, clear streams with rocky, silt-free riffles for spawning and slow, deep pools for feeding,

resting, and over-wintering (Reel etal 1989). Pools are a particularly important habitat component as cutthroat trout occupy pool habitat more than 70 percent of the time (Mesa 1991). Other key features of westslope cutthroat habitat are large woody debris (LWD) for persistent cover and habitat diversity as well as small headwater streams for spawning and early rearing.

Resident life history strategies of westslope cutthroat trout appear to be present in sub-watersheds within the project area. Resident populations remain in tributaries throughout their life. Certain life histories (e.g., fluvial and adfluvial fish) use tributaries for early rearing and spring spawning as adults, but typically migrate to river or lake habitat as they mature. In the fall, fish that have not previously returned to river and lake areas migrate to deeper water where they congregate and over-winter (Bjornn 1975).

Risks to Westslope Cutthroat Populations and Habitat - The primary cause of the decline in westslope cutthroat trout was found to be habitat loss and degradation (Rieman and Apperson 1989). Competition, predation by non-native species, genetic introgression and overfishing have also contributed to the decline of westslope cutthroat trout populations (McIntyre and Rieman 1995).

Habitat Conditions - Natural events and processes (e.g., wildfires, floods), as well as human activities (e.g., logging, road building, residential development), have influenced the environmental conditions within the cumulative effects analysis area. Effects of natural disturbances have interacted with other land changing processes to form the basic character of watersheds and the dependent stream resources. Due to the variability in location, frequency, intensity and ultimately, the effects of natural processes on the physical environment, dynamic landscapes with diverse conditions are formed at various spatial scales. Biological communities including native fish populations led to the development of functional ecosystems that are inherently resilient to effects from natural disturbance regimes representing pulse-type disturbances, such as periodic fire (Reeves etal 1995). Pulse disturbances influence the natural range of environmental conditions that are expected for ecosystems functioning at broad geographic scales, but typically allow systems to begin recovering to pre-disturbance conditions relatively soon after the disturbance.

Natural disturbance regimes and their associated properties (such as sedimentation rates and other influences on aquatic habitat) have been altered in the cumulative effects area by human activity. Land use activities that have modified natural disturbance characteristics include roads, logging, residential development, fire suppression, and stream modifications (i.e., constriction, diversions, culverts, etc.), with the majority of these activities occurring on private lands. Many of these human influences are considered press-type disturbances that continue to affect the condition and trend of fisheries resources long after the initial disturbance. Press disturbances differ from pulse disturbances in several aspects, but generally, press disturbances are persistent in ecosystems and impair the ability of ecosystems to recover to pre-disturbance conditions (Reeves etal 1995). Within the cumulative effects area, the recovery process from pulse

disturbances has been hindered to some degree by the presence of various press disturbances.

Streams and Lakes in the Project Area

The project is mostly located in the Moyie River in Idaho Watershed (1701010503) 5th level Hydrologic Unit Code (HUC). A small portion of the project area overlies the Kootenai River above Bonners Ferry watershed (1701010403).The affected 6th code HUCs are Lower Moyie River (170101050306) and Deer Creek (170101050308). There is a small portion (approximately 26 acres) of the project area located within the Kootenai River above Dobson Creek 6th code HUC Watershed (170101040302).

There are 5.0 miles of streams within or immediately adjacent to the project- 3.6 miles of perennial streams and 1.44 miles of intermittent streams. There is an additional 5.22 miles of the Moyie River that is immediately adjacent to the project area. Skin Creek, Deer Creek and Solomon Creek are all perennial. The stream running through private property in section 30 is intermittent. Stream segments of Deer Creek, Skin Creek and Solomon Creek have near-stream vegetation is that is abundant. All stream segments that were visited during field reviews in June of 2007 appear to be relatively stable.

Solomon Lake (10.8 acres) is also within the project boundary. It is over 3000 feet from the nearest project activity units- and easily outside the 150 feet buffer required by the Inland Native Fish Strategy (INFS). There are designated wetland areas within and immediately adjacent to project boundaries, but no activity units are located on or near wetland areas. There is one seep associated with the pond located in the southwest corner of the project area near Moyie Mine.

Environmental Consequences

This section provides information regarding the potential consequences from the implementation of the alternatives on westslope cutthroat trout. All direct, indirect, and cumulative effects are disclosed.

Methodology

The effect of the project on stream habitat is the main concern for fisheries resources. The analysis of direct and indirect effects is based on how the various components of the project (e.g., location, size of cutting units, methods of logging systems, road maintenance, and reasonably foreseeable actions) are expected to affect stream habitat within the analysis area. The issue indicators that will be used to measure effects to fish are changes to the elements that contribute to quality of stream habitat (i.e., sediment and water yield, large woody debris, and water temperature).

Analysis of direct, indirect, and cumulative effects to fish will use the concept of management indicator species (MIS). Under this concept, larger groups of organisms or communities are believed to be adequately represented by a subset of the group (Idaho Panhandle National Forest Plan; USDA Forest Service 1987). The IPNF Forest Plan identifies cutthroat trout as potential MIS for fisheries conditions. Westslope cutthroat trout are native to all fish-bearing streams within the cumulative effects area. They are

also likely sensitive indicators for all cold water biota within the stream segments (Meehan 1991). Therefore, westslope cutthroat trout are appropriate MIS for the fisheries analysis of this project.

Direct and Indirect Effects

Alternative 1 – No Action

Direct and Indirect Effects

The No Action Alternative would not directly affect aquatic resources or fisheries habitat in the project area. Since there would be no timber harvesting or prescribed burning under this alternative, there would be no direct effects to water temperature, large woody debris, sediment delivery, or water yield.

However, indirect effects could result from lack of treatment to reduce hazardous fuels. If a large-scale, stand-replacing fire occurred within the cumulative effects area, there would be no decrease in the intensity. Such a fire would have the potential to substantially increase sediment delivery to streams and degrade fish habitat.

Alternative 2 – Proposed Action

Direct Effects

There would be no direct effects to westslope cutthroat trout since no project activities would occur within stream channels. RHCAs would be managed according to INFS standards. The application of the Project Design Features and forest plan standards and guidelines would prevent direct effects from occurring in project area streams (See discussion of specific habitat elements below).

Indirect Effects

Indirect effects to cutthroat trout would occur if any of their habitat parameters were affected by the project. Those parameters most likely affected by timber harvest activities would be LWD, water quality (sediment), temperature/shade, and water yield.

Sediment – Sediment entering stream channels can affect channel shape and form, stream substrates, the structure of fish habitats, and the structure and abundance of fish populations (Chamberlain etal 1991). The highest risk for sediment delivery would come from units with close proximity to RHCAs, however there are no activities proposed near or adjacent to streams. Research suggests that buffer widths of 300 feet would be adequate to protect a stream from sediment in a worst case scenario (Belt etal 1992). There are no streams within project activity units and stream channels adjacent to the project activity units are far enough away that effects to stream temperature and sediment delivery are unlikely (Maloney 2008).

According to the hydrology analysis, any potential for sediment derived project activities would come from road use and would most likely come from use of FS Rd 2549, 627, 2269 and 2269A, and 2534. The activity units all have enough of stream buffer that WEPP modeling indicates that there is a very low risk for sediment delivery (details

regarding the WEPP model can be found in the hydrology report in the project file). Further, WEPP modeling indicates that sediment delivery from road maintenance and use activities on those roads would be negligible. In all modeled scenarios, sediment delivery was 1/10th of a ton or less annually for each of these roads. These are amounts that are well within the variation of natural sediment inputs and would not be differentiable from natural or project caused sedimentation. Further, it is expected that the implementation of Soil and Water Conservation Practices (SWCPs) (also known as Best Management Practices or BMPs) would prevent the delivery of the any sediment generated from roading activities. Several studies have found BMPs and site specific project design features to be effective in controlling impacts from forest management activities to water quality and stream habitats (Megahan et al, 1992; Seyedbagheri , 1996).

Water Yield –Past studies suggest that the most obvious and immediate response of a watershed to a forest management activity is change in water yield due to the change in total ecosystem evapotranspiration. Associated with this increase in runoff is elevated nutrient and sediment loading to streams (Sun etal 2004). Increases in water yield from management activities can be exacerbated by rain-on-snow events. According to the Hydrology analysis for this project, it is not expected that increases in peak flows or annual water yield related to project activity effects would occur. This is mainly due to the relatively low acreage of the project activity units, the spatial extent of the activity units, and protection of soil infiltration/runoff characteristics (Maloney, 2008).

Temperature/Shade –Harvest activities within RHCAs that result in reduction of forest canopy can reduce shade and affect stream temperature, cover, primary production and habitat (Belt etal 1992). Summer stream temperature increases due to the removal of riparian vegetation has been well documented (Belt etal 1992). Measurements by Hewlett and Fortson (1983) under winter conditions also indicate that removal of riparian vegetation can reduce temperatures by about 10°C. There are no proposed harvest units within or adjacent to RHCAs, therefore changes in temperature/shade would not occur.

Large Woody Debris - Large wood is important to the aquatic environment because it routes and stores sediment, provides habitat complexity, and acts as a substrate for biological activity. The potential to reduce recruitment would occur where trees are removed from the area having the highest potential for delivery to the system. Both McDade et al. 1990 and Van Sickle and Gregory 1990, reported that more than 90% of instream wood identified as coming from adjacent riparian sources came from within approximately one site potential tree height for mature stands (120 feet).
There would be no treatment within or adjacent to RHCAs, therefore large woody debris recruitment would not be affected by project activities.

Wildfire Risk - Forest fires often directly affect water quality in nearby streams and waterbodies. Common impacts to aquatic habitat from wildfire include increased sedimentation, ashflow, and water yield and decreased large woody debris. The proposed activities are expected to decrease the risk of large-scale wildfire, thereby decreasing the risk of associated impacts to westslope cutthroat trout habitat as a result of wildfire.

Cumulative Effects

Past, Present and Reasonably Foreseeable Actions

The cumulative effects area for this project is described as Lower Moyie River, Deer Creek, and Kootenai River above Bonners Ferry watersheds (See Hydrology Analysis). Past and present projects in or near the Twin Skin HFRA Project include timber harvest, road building, noxious weed treatments, firewood gathering, and dispersed recreation. There are some private residences adjacent to the cumulative effects area, but they were not included in the analysis as they fall outside of the cumulative effects hydrologic watershed boundary and therefore would not have an impact on any of the identified parameters for the issue indicators.

Outside of the project area there is an assortment of land ownerships including public Forest Service administered lands, private lands in forested settings utilized for residential use and commercial timber harvest, private lands in agricultural settings utilized for pastures and crop production, The range of activities associated and within this cumulative effects area includes home construction, road building and maintenance, forest silvicultural activities (thinning, harvesting, and planting), and dispersed recreation. Overall, there is a substantial amount of past, current land use activity within the cumulative effects area.

Reasonably foreseeable future actions include continued use of the transporation system, fuelwood and food gathering, recreation, possible wildfire suppression, fish and wildlife management, noxious weed treatments and incidental salvage following the project.

Cumulative Effects from Alternative 1

Because there would be no fuels reduction activities (e.g. timber harvest, prescribed burning) under this alternative, there is an increased probability of a large-scale fire outside of the natural range of variability. As forests cycle through stages of growth, development, and mortality, fuels are continually accumulating in all vegetative layers. Without treatment, this accumulation will only add to the already heavy fuels within the project area, increasing the fire hazard by more than is already present (refer to fuels analysis). A large-scale fire of this type could lead to an increase in sediment delivery to streams within the project area beyond what would naturally be expected. This potential sediment increase would likely result in a negative impact to the fisheries resource.

Cumulative Effects from Alternative 2

According to the hydrology report, it is not anticipated that there would be any cumulative effects to watershed resources resulting from this project. There are no expected direct or indirect effects to watershed resources or fisheries habitat within the project area. Since there are no expected direct or indirect effects to watershed resources or fisheries habitat, it is also anticipated that there would not be any measurable cumulative effects resulting from the implementation of the project on watershed resources or fisheries habitat.

Summary of Effects

Based on the above analysis, impacts to stream habitat would, at most, be negligible due to the proposed activities and project design. Project implementation, when viewed in conjunction with the cumulative effects of past, ongoing and reasonably foreseeable actions, would maintain stream habitat conditions for fisheries resources within the National Forests lands potentially affected by project activities.

Table 3. Summary of effects on fish species from alternatives

Species	Status	Alternative 1	Alternative 2
Westslope cutthroat trout	Sensitive	No Impact	No Impact

Consistency with the Forest Plan and Other Regulations

Idaho Panhandle National Forests Forest Plan

The proposed project meets the requirements of the IPNF Forest Plan for fisheries resources, as amended by the Inland Native Fish Strategy. The proposed project is expected to maintain the existing condition of all Riparian Management Objectives (RMOs) set forth in INFS, including stability, pool frequency, large woody debris, water temperature, and width/depth ratio.

Fry Emergence Amendment to the Forest Plan

On June 2, 2005, the Forest Supervisor for the Idaho Panhandle National Forests signed a Decision Notice and Finding of No Significant Impact that amended the Forest Plan to modify or remove objectives, standards and monitoring requirements pertaining to fry emergence success (USDA Forest Service 2005). The amendment was implemented because the fry emergence objectives, standards and monitoring requirements that were in the IPNF Forest Plan did not contribute as well as INFS objectives, standards, guidelines and monitoring direction towards meeting the goals of providing sufficient habitat in support of maintaining diverse and viable populations of fish species across the forest. In addition, because of the limited application of the fry emergence models and their unreliability, and the inability to determine fry emergence success in the field due to high variability affected by multiple natural and human-caused factors, the Forest Service was not able to state with any degree of certainty whether measures for fry emergence success were accurate or precise.

Endangered Species Act

The proposed action meets the requirements of the Endangered Species Act. There are no threatened or endangered fish species within the analysis area, therefore no effect to T&E species would occur and no consultation is required.

National Forests Management Act – Species Viability

Fish species that may be affected by the project (westslope cutthroat trout) are also distributed across the Forest. Fish species that may be affected by the project (westslope

cutthroat trout) are also distributed across the Forest. Cutthroat trout currently occur in 100 percent of 4th code HUC watersheds on the Forest (Baconrind Pers.Comm.). There is no connectivity between the 4th code HUC watershed within the cumulative effects analysis area and the other ten 4th code HUC watersheds on the Forest (e.g. St. Joe River).

Based on the distribution of species across the Forest, the lack of connectivity between large watersheds and the limited cumulative effects area, the Twin Skin project will not affect viability of any threatened, endangered, sensitive or MIS fish species on the IPNF.

Executive Order 12962

The goal of EO 12962 is to protect and improve recreational fishery resources. The proposed project would not impact recreational fisheries in any way, therefore it is consistent with EO12962.

State of Idaho Governor's Bull Trout Plan

There are no bull trout populations or habitat within the analysis area and according to the analysis, existing fisheries habitat overall would not be impacted. Therefore, the proposed project is consistent with the direction in the Governor's Bull Trout Plan.

Other Issue #4 – Noxious Weeds

Issue Indicator – Potential to introduce and spread noxious weeds

There has been an intensive weed control effort in and around the project area for several years. Known weeds of concern in the area are spotted knapweed, meadow hawkweed and common tansy. Also, noxious weed treatments have been occurring and will continue in the future in and around the project area as authorized through the Bonners Ferry Ranger District Noxious Weed Management Projects FEIS (September 1995) NEPA decision. Current control efforts in the project area include spraying on FSR #435, #2215, #2215A, #2215B, #2269 and #2269A. Monitoring and treatment of any infestations resulting from logging operations would be dealt with during routine weed management operations.

Other Issue #5 – Allocated Old Growth

Issue Indicator – Acres of Allocated Old Growth affected by project implementation

Old growth standard 10 (a) incorporates the definitions of old growth developed by the Regional Old Growth Task Force, documented in Green et al (1992 - errata corrected 02/2005), "Old Growth Forest Types of the Northern Region. USDA, Forest Service, Northern Region." The allocated old growth within the Twin Skin project area meets the old growth definitions included in Green et al. Both alternatives comply with Forest Plan direction to manage old growth habitat. Standards for old-growth habitat management are

to maintain at least 10 percent of the forested portion of the IPNF as old growth, maintain at least 5 percent of the forested portion of those old-growth management units (OGMUs) that have 5 percent or more existing old growth, and one or more old-growth stands per OGMU should be 300 acres or larger. The project area overlaps portions of OGMUs 24 (9,134 acres), 29 (16,979 acres) and 31 (16,970 acres) of which 14.9%, 6.0%, and 3.7% respectively are old growth (see project file OGMU map). OGMUs 24 and 29 each have one contiguous old-growth patch >300 acres. Currently, an estimated 11.8 percent of forested lands on the IPNF (FIA data: 90 percent confidence interval of 9.5 to 14.0 percent; 2004 IPNF Forest Plan Monitoring report) and 15.9 percent of forested areas in the Bonners Ferry/Kootenai Geographic Area (90 percent confidence interval of 10.2 to 21.9 percent) meet old growth criteria. The proposed action would not affect allocated old growth – there are two old growth stands in the project area (totaling 68 acres), both of which are outside of treatment areas. All allocated stands would continue to be managed for old-growth characteristics.

Consequently, there will be no direct, indirect or cumulative effects on allocated old growth resources resulting from implementation of either of the alternatives.

Other Issue #6 – Cultural Resources

Issue Indicator – Number of cultural resources impacted by project implementation

Cultural resource surveys of the project area have been completed as directed by the Cultural Resources Management Practices (Forest Plan, Appendix FF). An appropriate inventory has been conducted for the above project and cultural properties are known to be located within the area of potential effect. SHPO concurrence is thus required; however, the Forest Cultural Resource Specialist has made a preliminary determination that the project will have ***No Adverse Effect*** to these properties because the project has been designed to avoid significant effects to components/features associated with Class I and II properties. The Cultural Resources report is attached below.

Project Completion Memo

Idaho Panhandle National Forest

To: Linda McFaddan and Tom Sandberg

Twin Skin Healthy Forest Initiative Treatment	**R2008010401616**
Project Title	Report Number

Effect (36 CFR 800 Subpart B):

[] Because of the type of project, and/or its location, the Forest Cultural Resource Specialist has determined that the above project has little likelihood to adversely affect cultural properties. As a result, a ***No Inventory Decision*** has been made and the project may proceed.

[] An appropriate inventory has been conducted for the above project and no cultural properties are located within the area of potential effect. As a result, the Forest Cultural Resource Specialist has made a ***No Historic Properties Affected*** determination and the project may proceed.

[**X**] An appropriate inventory has been conducted for the above project and cultural properties are known to be located within the area of potential effect. SHPO concurrence is thus required, however, the Forest Cultural Resource Specialist has made a preliminary determination that the project will have ***No Adverse Effect*** to these properties because:

___ The cultural properties are not eligible for the National Register of Historic Places.

_X_ The project has been designed to avoid significant effects to components/features associated with Class I and II properties.

___ An attached report/plan provides certain information meant to resolve, minimize, reduce or mitigate adverse effects to Class I properties.

_X__ Idaho SHPO has concurred, the project may now proceed (attach copy of SHPO letter)

/s/ Stephan E. Matz	1/16/2008
Idaho Panhandle Forest Archeologist	Date

Comments: The Moyie Mine (10BY389-90) and hydraulic flume for the mine (10BY86) will be avoided by project actions, to include:

- All identified features of 10BY389-90 and intact sections of the flume for 10BY 86 will be excluded from project treatments through unit boundary marking that is a minimum 50 feet from site boundaries, except for skyline corridors and skid trails in Units 9 and 13 that must be approved by an archaeologist and marked or otherwise designated prior to harvest to avoid damage to the remaining sections of flume in the units.
- Site specific location descriptions and maps will detail actual site boundaries for internal contract preparation and administration and will be marked "**Exempt from Public Release"**; maps and descriptions will be released only to the extent necessary to assure site protection measures are carried out.
- A pre-implementation plan-in-hand review of avoidance procedures must be completed by the implementation staff and appropriate Zone or Forest Archaeologist immediately prior to harvest activities to assure protection of mine and flume features.

OTHER ISSUE #7 - Promote Community Assistance

Issue Indicator –

Benefits and costs associated with the alternatives. Also, acres within CWPP identified WUI to be treated, including estimate of volume of fuels to be removed and made available for utilization and economic benefits through permits, contracts, grants, agreements or equivalent (10-Year Strategy Implementation Plan Goal #4).

People are an important part of the ecosystem and the management of the Idaho Panhandle National Forests (IPNF) has the potential to affect local economies, as well as natural resources. This project is within the Boundary County Community Wildfire Protection Plan-identified boundaries for their wildland-urban interface (WUI) area. The project coordinates fuels reduction treatments on federal land to assist the community in carrying out a more broad-based and effective fuels treatment program across all ownership timberlands located adjacent to the project area. This project will also be making a concerted effort to promote utilization of hazardous fuels, including biomass, with the intent to act as a catalyst to help sustain existing businesses and also to create new forest products businesses in the community that, once created, will help reduce the cost of conducting fuels reduction treatments in low-value timber stands by increasing the value of small diameter and biomass forest products. The project will remove forest fuels across approximately 700 acres.

The National Environmental Policy Act (NEPA) does not require a monetary benefit-cost analysis. The development of timber sale programs and individual timber sales is guided by agency direction found in Forest Service Manual (FSM) 2430. The financial and, if applicable, economics efficiency analysis for timber sales is guided by Forest Service Handbook (FSH) 2409.18

The direct and cumulative effects of each alternative would be related to the costs and revenues generated by each. The proposed action (Alternative 2) would be financially efficient for a timber sale. The No Action Alternative has no costs or revenues associated

with it. Alternative 2 would generate revenues to the Federal Treasury and to Forest Service Trust Funds (KV, BD), which could be used to offset the costs of reforestation and fuels reduction. This alternative would also provide local employment opportunities for loggers, mill workers, equipment operators, and reforestation crews.

Table 1 - Project Feasibility and Financial Efficiency Summary (2007 dollars).

		Alternative 1	Alternative 2
Timber Harvest Information	**Acres**	**0**	**590**
	Volume (CCF)	**0**	**10,000**
	Estimated Stumpage Value ($/CCF)	**$0**	**$101.79**
	Total Revenue ($000)	**$0**	**$1,019,196**
Timber Harvest & Required Mitigation Only	**PNV ($000)**	**$0**	**$168,380**
Timber Harvest & Planned Ecosystem Projects	**PNV ($000)**	**$0**	**$NA**

Other Issue #8 – Visual Quality

Issue Indication – Changes to existing visual character

TWIN SKIN HFRA PROJECT

VISUALS ANALYSIS

December 20, 2007

The Scenic Integrity Objective (SIO) and corresponding Visual Quality Objective (VQO) for the project area is:

Unit(s) 2, 5, 6, 7, 16, 17, 18: LOW SIO (Modification VQO) - Low scenic integrity refers to landscapes that appear to be moderately altered. Deviations begin to dominate the valued landscape character being viewed but they borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles outside the landscape being viewed.

Units(s) 1, 3, 4, 8, 10, 11 and 15: ***MODERATE SIO (Partial Retention VQO)*** - Moderate scenic integrity refers to landscapes that appear to be slightly altered. Noticeable deviations must remain visually subordinate to the landscape character being viewed.

Unit(s) 9, 12, 13, 14: **HIGH SIO (Retention VQO)** - refers to landscapes where the valued landscape character "appears" intact. Deviations may be present but must repeat the form, line, color, texture and pattern common to the landscape character so completely and at such scale that they are not evident.

Will the proposed action meet the SIO (VQO) and therefore be consistent with the 1987 IPNF Forest Plan (Appendix D)?

Yes, under the following circumstances:

Unit(s) 2, 5, 6, 7, 16, 17 and 18 (Low SIO/Modification VQO): *These units encompass about 300 acres and are located away from any high or moderate concern level viewpoints. These units will be receiving a combination of commercial thinning, sanitation salvage, free-selection and shelterwood-with-reserve-tree cutting prescriptions using a ground-based tractor yarding system on Units 6, 7, 16 and 17(about 130 acres) and a skyline yarding system on Units 2, 4, 5 and 18 (about 200 acres). Most of these units will only be visible from foreground viewing areas along level 3 sensitivity forest roads (low concern), including Old Hwy 2, Forest Roads #2533, #2215, #627 #2215A and #2215B. Even where skyline corridors may be fairly obviously noticeable in foreground viewing areas in Unit 2 or in the middle ground viewing area of Unit 18 along Old Hwy 2, the expected change in scenic integrity will not dominate the surrounding landscape and should easily meet the Modification VQO (Low SIO).*

Given the low visibility location of these units and the proposed treatments, no other special treatments will be required to meet the SIO/VQO.

Unit(s) 1, 3, 4, 8, 10, 11 and 15 (Moderate SIO/Partial Retention VQO): *Units 1, 3, 4 and 8 encompass approximately 140 acres which are located in the foreground viewing area along Deer Creek Road #435 which is a moderate visual concern level viewing area (level 2). Deer Creek Road is frequently used by the public to access areas several miles farther up the road that have a higher level of scenic and other dispersed recreational values. Units 1(50 acres), 3 (58 acres), and 8 (25 acres) will be a free-selection prescription using the ground-based skidder-yarding system. Unit 4 (9 acres) will receive a shelterwood-with-reserve tree prescription that will be skyline-yarded. The combination of free-selection and shelterwood treatments will have the resulting effect of opening up the areas immediately adjacent to Deer Creek Road due to removal of the current dense undergrowth alongside the road.*

Units 10, 11 and 15 encompass about 130 acres with about half of the acreage being a group selection prescription with a skyline logging system and the other

half being a weed and release/improvement cut prescription with a tractor logging system. Both units would only be visible from either the immediate foreground off of low sensitivity level forest roads (level 3) or from the average sensitivity (level 2) Moyie River road #211 but only brief views from just a few locations along this road are possible.

Casual forest observers will notice the change in foreground scenery. The proposed treatments are expected to result in a landscape characteristic that will remain subordinate to the surrounding scenery, which has been moderately altered by previous timber management activities on both federal and private property. The treatment should actually result in somewhat enhanced views of the mid-ground viewing area, which will include improved views of Solomon and Goat Mountains.

Unit(s) 9, 12, 13, 14 (High SIO/Retention VQO): These units encompass about 100 acres with about 25% of the acres being a group selection prescription using the skyline logging system and the remaining 75% being a commercial thin/sanitation salvage/improvement cut prescription using tractor logging systems. These units will only be visible from low level (level 3) forest roads #2269 and #2584 in the immediate foreground with the exception of brief middle ground glimpses from a few locations along the average sensitivity level (level 2) Moyie River Road #211 of Unit 13.

Following the proposed treatments the characteristic landscape should appear intact. Minor deviations may be visible from limited viewing areas outside the immediate foreground (i.e. within the harvest units) but will repeat the form, line, color, texture and pattern common to the surrounding landscape.

Visual analysis and determination made by:

_____/s/ Barry Wynsma_____ December 20, 2007
Barry Wynsma, paraprofessional landscape architect. Date

Attached: photos for future monitoring purposes

Twin Skin HFRA Project area, viewed from 3-mile marker on Deer Creek Road near junction with FR #2533, looking northeast. Unit 3 on left and Unit 1 on right side of road.

(October 12, 2006 photo)

Twin Skin Project area, viewed approximately from 3 1/4-mile marker on Deer Creek Road near junction with FR #2533, looking southwest. Unit 1 on left and Unit 3 on right side of road.
(October 12, 2006 photo)

OTHER ISSUE #9 - Recreation

Issue Indicator – Changes to current recreational activities

The Bonners Ferry Ranger District offers a broad range of recreational opportunities extending from the Kootenai Valley floor up to the surrounding rugged mountain peaks and ridges. Recreation activities include hiking, biking, horseback riding, camping at developed and dispersed sites, boating, fishing, hunting, sight-seeing, berry-picking, firewood gathering, and other similar activities. There will be no changes to the current recreational uses within the project area under either alternative.

OTHER ISSUE #10 - Effects on Minority Populations and Low-income Populations

Issue Indicator – number of minority and low-income people affected

The Kootenai Tribe of North Idaho was consulted and no cultural sites that have any importance to the Tribe were identified within the project area. In addition, no other low-income populations that could potentially be impacted by either of the alternatives are located within the project area. Thus, no direct, indirect or cumulative effects on minority and low-income populations are expected from implementation of any of the alternatives. However, the project area is located just north of Moyie Springs, and many of the private landowners within the project area are considered residents of that community. It is probable that many of the forest products removed from the treatment units would be taken to the local mill in Moyie Springs, directly affecting the local economy in the short-term. This mill is operating only one shift rather than two of previous years – this has affected unemployment rates. The assurance of employment in the timber sectors under the action alternative may bring the local economy some increased relative stability. There may be ripple-down indirect affects associated with either of the alternatives related to this.

OTHER ISSUE #11 - Inventoried Roadless Areas

Issue Indicator – Acres in project area

There is no Inventoried Roadless Areas (IRA) within the project area. The Buckhorn Ridge IRA is approximately 1 mile east of the most eastern proposed treatment units – there will be no project related activities, including those that include transportation within this IRA. Consequently, there will be no significant direct, indirect or cumulative effects on roadless areas resulting from implementation of either of the alternatives.

OTHER ISSUE #12 - Minerals

Issue Indicator – Impacts on patented mining claims

There are no longer any patented mining claims within the assessment area. Consequently, there will be no direct, indirect or cumulative effects on mineral resources resulting from implementation of either of the alternatives.

OTHER ISSUE #13 - Special Uses

Issue Indicator – Impacts on special use permittees

Since lands/special uses activities are not a resource per se, there are no specific Forest Plan goals associated with the lands function. Goals, objectives and standards for the various Forest Plan Management Areas will determine the specific actions necessary to respond to the public's or other agencies' proposals for use of National Forest Lands. As part of the analysis for this project, special use permits in the project area were identified. Service lines exist along potential haul routes, thus care to protect these improvements will be necessary if Alternative 2 is implemented (Northern Lights has service lines in Sections 19 and 30 T63N, R3E that are in the road right-of-way (ROW) for a short distances of FSR #435 and #2215A and Verizon has a ROW for a telephone line in Section 30 and 31 of T63N and R3E). These lines do not currently interfere with normal use of the road which includes access by service vehicles and log trucks, therefore project activities (including hauling) are not expected to affect the service lines. There is one road easement through Unit 9 (Section 2 of Township 62 North and Range 2 East); the Forest Service retained the right to occupy and use the right-of-way as described in the easement. None of the other special use permits would be affected by the proposed action, as they occur outside of treatment units (see project file for a map of special use permits in the project area). Consequently, there will be no other direct, indirect or cumulative effects on special uses resulting from implementation of either of the alternatives.

OTHER ISSUE #14 - Transportation System

Issue Indicator – Number of miles of new road construction or reconstruction

No new permanent roads will be constructed. Interdisciplinary team meetings, field reconnaissance and a roads analysis process (RAPS meeting on March 8, 2007) determined that existing access roads, including Forest Roads #435, #435UF, #2215, #2215A, #2215B, #2269, #2533, #2404A, #2549, #2584, #2584U, #2549UH, #2549UE and #627 may be used for this project. Segments of these roads (totaling approximately 14 miles) would require maintenance (reconditioning) or reconstruction (#2549UH and #2549UE) prior to use. Related work may include roadside brushing, blading, ditchline cleaning and shaping, spot graveling and culvert installation and

replacement at locations recommended by the project IDT and removal of hazard trees along the haul routes. It is anticipated that up to one and one-half mile of temporary roads may be needed to access timber in Units 2 and 10. The temporary roads would be obliterated by the contractor following use. The obliteration would restore the segments to their pre-roaded condition and would be revegetated and covered with slash to prevent off-road vehicle use. Existing roads associated with Units 16, 17 and 18 (within the Keno BMU) requiring the removal of vegetation to make them drivable ("reconstruction" of #2549UH and #2549UE) will also require a mechanism (such as the placement of large woody debris or an earthen barrier) to prevent vehicle access after completion of project activities. During project implementation a method to prevent private vehicle use of these reconstructed roads would be necessary (such as using equipment as barriers).

Alternative 1

Direct and Indirect Effects: The direct effects of the no-action alternative will include delaying road maintenance and reconstruction improvements until some future date or under some other funding mechanism that is not currently in the foreseeable future activities within the project area haul route. Some sections of existing roads will continue to run water across road surfaces where ditches have become filled in with sediment, organic debris and brush and drainage relief culverts have become plugged, which will increase the occurrence of rutting the road surface in these locations. Postponing maintenance at this time may indirectly affect the future costs for conducting this work, as it may create more extensive maintenance needs at a later date. Public use of the open roads may experience occasional road blockages due to dead trees falling on the roads. Existing blind spots from brush along roadsides will remain until cleared at some unknown time in the future.

Under Alternative 1, temporary road construction would not occur, thus there would be no displacement of soil and temporary loss of soil productivity or additional detrimental disturbance in the project area.

Cumulative effects - Assuming that maintenance will be conducted on the roads within the project area haul route at some point in time in the future, the only cumulative effect will be to add to the future needs for road maintenance work, likely at inflated rates compared to present costs.

Alternative 2

Direct and Indirect effects - The direct effects of completing the road reconditioning and reconstruction work will include accomplishing minor road reconstruction work to restore the effectiveness of ditches and reduce erosion by spot gravelling those sections of road that are currently rutted due to past runoff events. Public safety will also be improved by removing blind spots and hazardous trees along roadsides within the project area haul route. Conducting the work at this time may indirectly reduce future maintenance costs by stopping further degradation of the road system.

Cumulative effects - The cumulative effects from conducting reconditioning and minor road reconstruction work on the project road segments at this time should be the beneficial reduction of future maintenance costs resulting from the retardation of road surface, ditch-line and relief pipe degradation.