United States
Department of
Agriculture

Forest
Service

Northern Region

Idaho Panhandle
National Forests

St. Joe
Ranger District

May 2011

Bussel 484

Draft Supplemental Environmental Impact Statement

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Bussel 484
Draft Supplemental Environmental Impact Statement

Idaho Panhandle National Forests, St. Joe Ranger District
Shoshone County, Idaho

May 2011

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Abstract: This supplemental environmental impact statement (SEIS) supplements portions of the May 2008 Bussel 484 Final Environmental Impact Statement (FEIS). On August 6, 2010, Idaho District Court Judge Edward J. Lodge, in the court case The Lands Council v. Jane Cottrell and Ranotta McNair (Case No. 2:09-CV-164-EJL-REB) set aside the Bussel 484 Project and remanded it to the Forest Service. This supplemental EIS addresses requirements of the court and updates the analysis based on new information since the original analysis was completed. The 2008 Bussel 484 FEIS describes the purpose and need for the project, alternatives, affected environment, and environmental consequences. That information is not repeated here unless it is needed to clarify the supplemental analysis.

The comment period for this draft SEIS will be 45 days from the date the Environmental Protection Agency publishes the notice of availability in the Federal Register.

This supplemental EIS and the 2008 FEIS are based on documents in the project file that are available upon request.

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Bussel 484 Draft Supplemental EIS

Introduction

This analysis supplements portions of the May 2008 Bussel 484 Final Environmental Impact Statement (FEIS).

On August 6, 2010, Idaho District Court Judge Edward J. Lodge, in the court case The Lands Council v. Jane Cottrell and Ranotta McNair, Case No. 2:09-CV-164-EJL-REB, set aside the Bussel 484 Project and remanded it to the Forest Service. Judge Lodge said the Forest Service's reliance on habitat-as-proxy for analysis of management indicator species was arbitrary and capricious. He also ordered the Forest Service to evaluate whatever fire plan is in effect at the time of any new supplemental EIS.

This supplemental EIS addresses requirements of the court and updates the analysis based on new information since the original analysis was completed. Supplemented portions of the EIS include:

- Fire and Fuels
  - Clarification of management direction
- Fisheries
  - Critical habitat for bull trout
  - New sensitive species: western pearlshell mussel
- Sensitive Plants
  - New sensitive species: greater yellow lady’s slipper and Hudson's bulrush
- Wildlife
  - Threatened and endangered species
  - Management indicator species
  - New sensitive species: long-eared myotis, long-legged myotis
  - New information about fisher

The 2008 Bussel 484 FEIS describes the purpose and need for the project, alternatives, affected environment, and environmental consequences. That information is not repeated here unless it is needed to clarify the supplemental analysis.

Public Involvement

The public was notified of the intent to prepare a supplemental environmental impact statement when the Notice of Intent was published in the Federal Register on April 20, 2011. The notice specifically stated that the Forest Service was not inviting comments at that time. Scoping is not required for supplements to environmental impact statements. There was extensive public involvement in the development of the proposed action, the 2008 Draft EIS, and the 2008 Final EIS. A 45-day comment period for this draft supplemental EIS will begin when the Environmental Protection Agency publishes the notice of availability in the Federal Register. This draft supplemental EIS is being distributed to everyone on the mailing lists for original Bussel 484 DEIS and FEIS.

Fire and Fuels

The following section replaces "Differences between Draft EIS and Final EIS" on page 117 of the FEIS.

Changes between the Final EIS and this Supplemental EIS

Judge Lodge ordered the Forest Service to evaluate whatever fire plan is in effect at the time of any new supplemental EIS (Memorandum Order page 32).

Current direction for wildfire management on the Idaho Panhandle National Forests comes from the Forest Plan. Forest Supervisor, Ranotta K. McNair, withdrew the Idaho Panhandle National Forests 2008 Fire Management Plan because she determined it was not needed in order to implement Forest Plan and other applicable direction for responding to unplanned ignitions (McNair 2009; Weldon 2010). References to the 2008 IPNF Fire Management Plan were removed from this EIS.

The 2008 IPNF Fire Plan did not make fire management decisions, but it did provide a summary of the desired conditions, standards, guidelines, goals, and objectives in the forest plan (McNair letter to The Lands Council March 24, 2009). The 2008 FEIS listed fire suppression as a present and reasonably foreseeable activity (FEIS p. 47) and explained that efforts would be made to suppress all fires which occur within the project area (FEIS p. 49). That is still the case, for the reasons explained below.

The original Bussel 484 EIS explained that prescribed burning outside of harvest units would not be used (FEIS p. 11-12); but it was not clear that, for the same reasons, wildfires would be suppressed.

In order to comply with the Court's order this supplement clarifies that all wildfires would be suppressed in the Bussel 484 Project Area. Consistent with the IPNF Forest Plan, the Forest Service would suppress all unplanned ignitions in the Bussel 484 Project Area because wildfire would pose unacceptable risks for the following reasons:

- Approximately 12,010 of the 12,190 acres of National Forest System lands in the project area are designated for timber production, and the Forest Service has invested a great deal in these areas through site preparation, reforestation, and other stand-tending activities.
- Many of the stands in the project area are stocked with young trees that, regardless of species, have thin bark because of their age and are therefore highly susceptible to fire-induced mortality.
- Potlatch Corporation owns land adjacent to the National Forest System lands in the project area, and the Idaho Department of Lands manages land near the project area.
- The Bonneville Power Administration transmission line runs through the project area.
- If we were to let a wildfire burn early in the season it would be extremely difficult to control when conditions begin to dry later. Canopy cover within the project area is very high. High canopy cover results in heavy shading of the forest floor, keeping fuel temperatures low and fuel moistures high throughout the spring and early summer. Natural fuels and the forest floor climate make it very difficult for a fire to spread on the ground during typical early season conditions. Later in the season on warm days from July through September the transition from benign surface fire to problematic crown wildfire can occur rapidly and is difficult or impossible to control. This type of wildfire behavior would result in tree mortality and make it very difficult to keep a wildfire on the National Forest System lands. This would pose unacceptable risk to adjacent lands.

The direction to suppress wildfires in the Bussel 484 project area is evaluated as described in Table 1.

Table 1 – Location of Discussions of Fire Suppression as Fire Management Direction

Page	Subject
FEIS Summary	Alternative A would maintain existing level of management including fire suppression
FEIS p. 11	research indicates more fires will escape initial suppression
FEIS p. 13	With Alternative A fire suppression would continue
FEIS p. 47	Fire suppression is reasonably foreseeable
FEIS p. 48	Effects of fireline construction used to suppress wildfires
FEIS p. 49	Efforts will be made to suppress all fires that occur within the project area. Effects of past and continuing fire suppression are considered for air quality, fire and fuels, fisheries, forest vegetation, noxious weeds, old growth, plant species at risk, soils, water, and wildlife.
FEIS p. 52	Decrease in smoke generated from wildfires due to the advent of effective fire suppression
FEIS p. 73	Effects of past fire suppression on fisheries
FEIS p. 76	Road density resulting from roads built for fire suppression and effects to fisheries
FEIS p. 77	Effects of fire suppression on fisheries
FEIS p. 93	Continuation of fire suppression and effects on sediment and water yield
FEIS p. 106	Effects of present and reasonably foreseeable fire suppression on fisheries
FEIS p. 120	Fire suppression tactics; Use of indices for determining trends for potential fire suppression activities
FEIS p. 121	Success of fire suppression efforts to date; Affected environments of project area related to fire suppression; Fire suppression history in project area
FEIS p. 123	Fire suppression tactics related to fire flame lengths
FEIS p. 126	Effects of continues fire suppression
FEIS p. 127	Road access for fire suppression
FEIS p. 128	Effects of harvest activities on fire suppression access
DSEIS p. 3	Effects of road decommissioning and timber harvest on fire suppression
FEIS p. 130	Cumulative effects of fire suppression on species composition, structure, and the forest's response to wildfires; Continued fire suppression is consistent with the Forest Plan for all alternatives.
FEIS p. 134	Effect of fire suppression on forest composition
FEIS p. 135	Effect of fire suppression on forest structure
FEIS p. 137	Effect of fire suppression and lack of openings in forest canopy
FEIS p. 138	Effect of fire suppression with no action; Continuation of current fire suppression policies
FEIS p. 143	Continuation of aggressive wildfire suppression
FEIS p. 146	Current and reasonably foreseeable fire suppression and effects for noxious weeds
FEIS p. 147	Effects of fire suppression activities for noxious weeds
FEIS p. 153	Effects of fire suppression on old growth
FEIS p. 161	Stand-replacing fires were important part of the ecosystem prior to fire suppression efforts
FEIS p. 183	Continuation of fire suppression; Effects of fire suppression on soils; Effects of past fire suppression; Effects of proposed vegetation treatments on our ability to suppress fires
FEIS p. 190	Effects of successful fire suppression on soil productivity;
FEIS p. 229	Continuation of fire suppression and related activities
FEIS p. 244	Our inability to measurably predict effects of fire suppression
FEIS p. 277	Current fire suppression policy and affected environment for black-backed woodpecker in terms of large areas of fire-killed trees
FEIS p. 278	Effects of fire suppression on black-backed woodpecker habitat quantity and quality

The following section replaces "Regulatory Framework" on pages 118-119 of the FEIS.

Regulatory Framework

Forest Plan Direction

IPNF forest-wide management direction states "Provide efficient fire protection and fire use to help accomplish land management objectives" (USDA Forest Service 1987).

Forest Plan fire management standards state that fire protection and use standards are specified by management area. "Cost effective fire protection programs will be developed to implement management direction based on on-site characteristics that affect fire occurrence, fire effects, fire management costs and fire caused changes in values." Management area standards define requirements for fire protection.

Appendix F of the Forest Plan says appropriate wildfire responses are confine, contain, and control in all management areas in the project area (MA1, MA4, MA9, and MA16).

Prescribed fire is utilized in accordance with management area standards to accomplish specific resource objectives, such as to manage wildlife habitat, meet silvicultural objectives as prescribed in the silvicultural prescription or other area objectives. Fire management is a support function integrated with and responsive to the management direction established in the Forest Plan. Fire would be used within predetermined criteria to meet specific management objectives.

Appendix F of the Forest Plan states:

> Fire is a natural force in the ecosystem of the IPNF. The effects of fires will be detrimental or desirable depending on when and where fires occur and nature of the fires relative to management objectives. Prolonged fire exclusion leads to changes in forest composition and distribution patterns, which can also have detrimental or desirable consequences. Ecological principals relative to fire must be integrated into fire use and protection requirements along with requirements for resource protection and efficiency. Fire use and protection standards included in each management area will:
>
> 1. Use prescribed fire where it is the most effective way to achieve ecosystem responses required for management objectives.
> 2. Reduce the total cost of land management by integrating fire protection and fire use in management direction.

Forest Service Manual

Forest Service Manual 5130.2 states that the objective of wildland fire suppression is to "safely suppress wildfires at a minimum cost consistent with land and resource management objectives and fire management direction as stated in Fire Management Plans." For the Idaho Panhandle National Forests the fire management plan is the Forest Plan (Weldon letter 4/13/2010, project file document SFF-1).

The following paragraph replaces the last paragraph of Alternatives B and C "Direct and Indirect Effects" which is the third paragraph on page 130 of the FEIS.

The proposed road decommissioning would most likely reduce the potential for human-caused ignitions by reducing accessibility. The proposed road decommissioning may result in an increase of the average cost per acre for fire suppression within the areas affected by reduced motorized access. This would be due to reduced access for engines and water tenders, increased hike-in distance and potential increases in the use of aerial delivery of firefighters and the supplies they need. However, the proposed harvesting may provide opportunities to utilize changes in fuel types as natural barriers to fire spread that may allow

managers to more readily reduce suppression costs, and reduce disturbance associated with traditional suppression actions.

Fisheries

The Bussel 484 FEIS Fisheries section (pages 62-116) was reviewed to ensure compliance for Proposed, Endangered, Threatened, Candidate species, R1 Sensitive species, and IPNF management indicator species (MIS). Species or habitats are only discussed in this supplemental EIS if:

1. A change in conditions on the ground warranted changed effect/impact determinations.
2. Additional "best available science" would change effect/impact determinations.
3. Species are an addition to the Endangered, Threatened, and Federal Candidate species list or the Regional Forester's Sensitive Species list that was used in the original 2008 report. Some species have been added and removed from the Sensitive Species list since the 2008 FEIS.
4. Federal status has changed since the 2008 FEIS.

If a species is not addressed in this SEIS refer to the Bussel 484 Final Environmental Impact Statement (FEIS) [USDA 2008a, pages 62-116] for effects analysis.

Federal Listed Species

The U. S. Fish and Wildlife Service (USFWS) identified two listed fish species that may occur on the Idaho Panhandle National Forests (Species list # 1-9-09-SP-0035, February 11, 2009) [USDI 2009a]: Kootenai River white sturgeon and bull trout. Only the bull trout has potential habitat in the Bussel 484 project area.

Bull Trout

For effects analysis for bull trout see FEIS pages 62 through 117. There are no changes to the anticipated effects for any alternative. The bull trout is discussed in this supplemental EIS because Marble Creek was designated as critical habitat for bull trout in 2010. The lower eight miles of Marble Creek is within the fisheries cumulative effects analysis area (FEIS p. 63).

On September 25, 2005 the USFWS published a final rule designating critical habitat for the Klamath River, Columbia River, Jarbidge River, Coastal-Puget Sound and Saint Mary-Belly River populations of bull trout (70 FR 56212). This rule did not designate critical habitat on National Forest System lands. On December 22, 2008 the USFWS notified the court of its intent to review a December 15, 2008 Interior Department Inspector General Report disclosing irregularities in development of its 2005 bull trout final critical habitat designation. On March 23, 2009 the USFWS requested a voluntary remand of the 2005 final critical habitat rule to address irregularities in the rule-making process and outcome as identified by the 2008 Inspector General report. On July 1, 2009 the court granted the Service's request for a remand, and directed the Service to submit a proposed revision to the Federal Register by December 31, 2009, and a final designation by September 30, 2010. On January 13, 2010 the FWS published the proposed critical habitat revision, a Justification document that includes Rationale for Why Habitat is Essential, and Documentation of Occupancy, and Draft Economic Analysis. The final bull trout critical habitat designation was published in the Federal Register on October 18, 2010 and went into effect on November 17, 2010 (USDI 2010).

The FWS final designation of bull trout critical habitat utilizes primary constituent elements (PCEs) to determine which areas were occupied at the time of listing of the bull trout to propose as critical habitat. PCEs consider physical and biological features that are essential to the conservation of the species. Appendix B compares PCEs to the habitat indicators that are currently displayed in the environmental

baseline matrix. This PCE matrix crosswalk provides the supporting rationale that the PCEs for bull trout critical habitat are thoroughly addressed in the current matrix analysis and that the environmental baseline conditions and determination for effects to the species consists of a biological and habitat component addressing in total the PCEs listed in the rule for critical habitat.

Appendix B covers all PCEs except for non-native species. See the FEIS (page 74) for information on non-native species.

Sensitive Species

The Regional Forester Sensitive species list was updated in February of 2011 and will take effect May 27, 2011 (USDA 2011).

Western Pearlshell Mussel

The western pearlshell mussel is a new addition to the Regional Forester's list for the Idaho Panhandle National Forests (USDA 2011). This species was not on the Sensitive Species list when the Bussel 484 FEIS was completed.

Geographic Scope and Methodology

The western pearlshell mussel (*Margaritifera falcata*) is the most common mussel species in the Pacific Northwest (Jepson and others 2011) and the population is apparently secure in the U.S. (N4 [Jepsen and others 2011]). In Idaho, the historical range of *M. falcata* includes sites in the Snake, Coeur d'Alene, Lost, and Salmon River drainages (Frest 1999). Populations persist in north Idaho in the Coeur d'Alene, St. Joe, and St. Maries Rivers. In central Idaho, populations with good viability occur in the Clearwater, Selway, Lochsa, Pahsimeroi, Lost, Salmon and Little Salmon rivers and in Hells Canyon. In south Idaho, populations are thought to be extant in the upper tributaries of the Snake River, including the Blackfoot River (Frest 1999).

The western pearlshell mussel has been located in the St. Joe drainage, in the St. Maries drainage downstream of Santa Creek and in the East Fork of Emerald Creek (Frest 1999). No surveys have been conducted within the Bussel 484 project area.

The effects to western pearlshell mussel are indicated by the effects to westslope cutthroat trout and sediment as described in the 2008 FEIS.

Affected Environment

Habitat requirements for western pearlshell mussels are similar to habitat requirements for western cutthroat trout, specifically related to sediment levels. The preferred habitat for the western pearlshell mussel is cold, clear streams and rivers (Frest 1999). Pearlshell mussels occur in waterways with low velocities, low shear stress and stable substrates and are frequently found in eddies or pools (Howard & Cuffey 2003). The species is intolerant of heavy nutrient loads, siltation and water pollution (Frest 1999).

Glochidia, or larva, of western pearlshells are fish parasites that attach to the fins or gills of host fish (Frest 1999). Host fish include westslope cutthroat trout (Stagliano 2007) and potentially bull trout and brook trout (Jepsen et al 2011).

Bussel Creek and its tributaries are on Idaho Department of Environmental Quality's 303(d) list as not supporting beneficial uses because of sediment and temperature (FEIS p. 77). Overall, existing fish and mussel habitat is considered to be Highly Altered from the historic range of variability and/or at high risk of further undesirable change. These conditions are largely due to large fires and floods in the past and incremental effects of past management overtime (FEIS p. 93). Sediment yield is above reference conditions because of roads and the removal of large woody debris from streams for log drives during the early 1900s.

Western cutthroat trout have maintained or increased their population abundance over a very large area within Idaho (including the St. Joe River) over the last 15-34 years (FEIS p. 74). Populations appear to be stable or increasing throughout most of northern Idaho, and trend data from Idaho Fish and Game snorkel counts show that cutthroat trout populations in the St. Joe River basins appear to be stable or increasing (Idaho Panhandle National Forest Forest Plan Monitoring and Evaluation Reports for 2007-2009 p. 85-87).

Environmental Consequences

Alternative A

Direct and Indirect Effects (FEIS p. 93-94)

Alternative A would have *No Impact* on western pearlshell mussel individuals or habitat. In the No-Action Alternative, no new management-induced effects (detrimental or beneficial, direct or indirect) to pearlshell mussel would occur. No measurable immediate change in mussel habitat is expected with the No-Action Alternative. Over time, elements of riparian habitats and RHCAs would continue to improve and stabilize, so habitat conditions for fish and mussel would continue to improve.

Cumulative Effects

Alternative A would not incrementally add to cumulative effects, as there would be no direct or indirect effects associated with Alternative A.

Alternative B

Direct and Indirect Effects (FEIS p. 95-104)

The effects to pearlshell mussel are based on effects to westslope cutthroat trout and on changes in stream sediment. Project activities are not expected to detrimentally affect mussels. Watershed conditions for fish are expected to improve or remain the same (FEIS p. 109-115) , so the same would be true for pearlshell mussels. The proposed fish migration barrier removal would replace two culverts on Road 1900 that are currently barriers to fish passage. Because fish act as hosts for mussel glochidia (larva), the removal of the barriers would benefit mussel by allowing the host to access additional habitat. The replacement of these two human-created migration barriers would allow improved migration access to approximately three miles of habitat (FEIS p. 98). See FEIS pages 95-117 for discussions of effects to cutthroat trout. Sediment would increase in the short term when culverts are replaced or removed (FEIS p. 231-234), but it would decrease in the long term over the entire Bussel Creek drainage (FEIS p. 106, 107, 233, 238).

Alternative C

Direct and Indirect Effects

Analysis shows that in Alternative B proposed treatments are not expected to detrimentally affect mussels. Because Alternative C proposes no new road construction, less ground-based logging, and fewer miles of road open to motorized vehicles, there would be a greater net improvement to the larger Bussel Creek watershed with respect to the reduction of sedimentation from roads, logging, and access management. There would also be reduced risk of increased road densities to the individual subwatershed and the larger Bussel Creek watershed. Overall, Alternative C has fewer short-term risks to the watershed condition than Alternative B (FEIS p. 104); so it would have fewer short-term risks to western pearlshell mussels. Stream conditions would be maintained or be improved in the long term for fish (FEIS p. 104, 109-117); therefore conditions would be maintained or be improved in the long term for western pearlshell mussel.

Alternatives B & C

Cumulative Effects

The subwatersheds in the fisheries analysis area are currently rated as *Highly Altered/High Risk* or *Moderately Altered/Moderate Risk* because of the past activities and natural influences (FEIS p. 107). Cumulatively, those conditions would be maintained or would be improved (FEIS p. 109-115).

Alternatives B and C *May Impact* western pearlshell mussel individuals or habitat, but would not likely contribute to a trend towards federal listing or loss of viability to the population or species. This is primarily because RHCA buffers on project activities would ensure mussels are not subjected to any direct effects from vegetation treatment activities, and culvert removal or replacement would benefit mussels in the long term. Indirect effects would also be substantially moderated by the presence of these buffers as large woody debris would be retained and accumulated, aiding in stabilizing stream banks, reducing sediment delivery potential to streams, maintaining riparian shade, maintaining habitat-forming large woody debris and protecting mussels. Western pearlshell mussel populations are linked with cutthroat trout populations, and those are stable or increasing.

Cumulatively, the Marble Creek watershed would continue to have water quality issues until riparian zones and riparian vegetation recovers more fully and roads are reduced.

Neither of the action alternatives would cause a net degradation or loss to any of the indicators critical for maintaining healthy conditions for fish and mussels. Collectively, restorative activities in Alternatives B and C would improve some conditions for fish and mussels in the long term and the short term. Stream temperatures, large woody debris, pools, sediment, fish migration barriers, fish populations, and beneficial uses would improve in the long term (FEIS p. 108); so mussel populations would also improve.

Summary of Sensitive Fish Species Conclusion of Effects

Species	Alternative A	Alternative B	Alternative C	Location of Effects Analysis
Westslope Cutthroat Trout	NI	MIIH	BI	FEIS pages 247-248
Western Pearlshell Mussel	NI	MIIH	MIIH	SEIS pages 6

NI - No Impact

MIIH- May Impact Individuals or Habitat, But Will Not Likely Contribute to a Trend Towards Federal Listing or Loss of Viability to the Population or Species

WIFV- Will Impact Individuals or Habitat With a Consequence That The Action May Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species

BI - Beneficial Impact

PREPARED BY: /s/Kristopher Hennings DATE May 5, 2011

Consistency with Forest Plan and Regulatory Framework

All alternatives would be consistent with forest plan guidelines and standards for fisheries (FEIS p. 116-117 and FEIS Appendix D). The alternatives would meet National Forest Management Act requirements to provide for diversity of plant and animal communities by maintaining or improving watershed conditions and habitat conditions for the host fish species (FEIS p. 117). The alternatives are consistent with Executive Orders 11988 and 11990 because they would not damage wetlands and riparian dependent resources would be protected (FEIS p. 117).

Plant Species at Risk

The FEIS Botany section was reviewed to ensure compliance for R1 Sensitive Species. Table 2 shows all plant species considered during analysis with additions made in 2011 (project file SB-1). Surveys for the Bussel 484 project include surveys for all plants with more intensive surveys in high potential plant guilds (Mousseaux, 1995). The analysis completed in 2008 and its conclusions are still sufficient with the additional species added to the sensitive list in 2011. These plant species would have been found during field surveys of the moist and wet habitat guilds if the plants were present because all plants are noted during surveys. Only the sensitive plant species discussed in the 2008 Bussel 484 EIS (FEIS p. 163) had occurrences in the project area.

Species or habitats are only discussed in this supplemental EIS if:

1. A change in conditions on the ground warranted changed effect/impact determinations.
2. There was a significant addition to the available science that would change impact determinations.
3. Species are an addition to the Regional Forester's Sensitive Species that was used in the original 2008 report.

If a species has a "No" in the *Addressed in this Supplemental Document* column then refer to the Bussel 484 Final Environmental Impact Statement (pages 157-163) for effects analysis.

Table 2 - Plant Species Considered for Bussel 484 Supplemental EIS

Scientific Name Common Name	Current Status	Sufficient Analysis Completed in 2008 FEIS	Addressed in this SEIS
Asplenium trichomanes maidenhair spleenwort	R1 Sensitive	Yes	No
Blechnum spicant deerfern	R1 Sensitive	Yes	No
Botrychium ascendens upswept moonwort	R1 Sensitive	Yes	No
Botrychium crenulatum dainty moonwort	R1 Sensitive	Yes	No
Botrychium lanceolatum triangle moonwort	R1 Sensitive	Yes	No
Botrychium lineare (h) Slender moonwort	R1 Sensitive	Yes	No
Botrychium minganense Mingan moonwort	R1 Sensitive	Yes	No
Botrychium montanum western goblin	R1 Sensitive	Yes	No
Botrychium paradoxum paradox moonwort	R1 Sensitive	Yes	No
Botrychium pedunculosum stalked moonwort	R1 Sensitive	Yes	No
Botrychium pinnatum northwestern moonwort	R1 Sensitive	Yes	No
Botrychium simplex least moonwort	R1 Sensitive	Yes	No
Buxbaumia aphylla leafless bug-on-a-stick moss	R1 Sensitive	Yes	No
Buxbaumia viridis Green bug-on-a-stick moss	R1 Sensitive	Yes	No
Cardamine constancei Constance's bittercress	R1 Sensitive	Yes	No

Scientific Name Common Name	Current Status	Sufficient Analysis Completed in 2008 FEIS	Addressed in this SEIS
Cypripedium fasciculatum clustered lady's slipper	R1 Sensitive	Yes	No
Cypripedium parviflorum var. pubescens (S) **greater yellow lady's slipper**	R1 Sensitive	Yes	**Yes**
Grindelia howellii Howell's gumweed	R1 Sensitive	Yes	No
Gimmia brittoniae Britton's Grimmia	R1 Sensitive	Yes	No
Hookeria lucens (h) clear moss	R1 Sensitive	Yes	No
Mimulus alsinoides chickweed monkeyflower	R1 Sensitive	Yes	No
Rhizomnium nudum Naked Mnium	R1 Sensitive	Yes	No
Thelypteris nevadensis Sierra woodfern	R1 Sensitive	Yes	No
Triantha occidentalis spp brevistyla sticky asphodel	R1 Sensitive	Yes	No
Trichophorum alpinum **Hudson's bulrush**	R1 Sensitive	Yes	**Yes**
Waldsteinia idahoensis Idaho barren strawberry	R1 Sensitive	Yes	No

** based on Regional Forester's TES list 2011. (s)=suspected (h)=historical occurrence*

Two species have been added to the R1 sensitive list: *Cypripedium parviflorum var. pubescens and Trichophorum alpinum.*

*Cypripedium parviflorum var. pubescens (*greater yellow lady's slipper) is a coastal disjunct member of the orchid family that has recently been found in the North Zone of the Idaho Panhandle National Forests. This large yellow orchid grows in wet and moist habitats (see Project File B-1 Bussel 484 FEIS, USDA, 2008). Habitats where surveyed for all plants for the 2008 FEIS, and no greater yellow lady's slipper plants were found (Project File B-1).

*Trichophorum alpinum (*Hudson's bulrush) is found in deciduous riparian habitats. This plant was added to the IPNF portion of the R1 species list in 2011. This habitat does not exist in the Bussel 484 project area. No incidental locations outside of the habitat were found during surveys.

Alternatives would have no impact on Hudson's bulrush and greater yellow lady's slipper.

Wildlife

The Bussel 484 FEIS Wildlife section (pages 242-281) was reviewed to ensure compliance for Proposed, Endangered, Threatened, Candidate species, R1 Sensitive species, Idaho Panhandle National Forests management indicator species (MIS), and other species. Table 3 outlines all wildlife species and habitats considered during analysis. Table 3 also identifies if the analysis completed in 2008 is still sufficient. Species or habitats are only discussed in this supplemental EIS if:

1. A change in conditions on the ground warranted changed effect/impact determinations.
2. Additional "best available science" would change effect/impact determinations.
3. Species are an addition to the Endangered, Threatened, and Federal Candidate species list or the Regional Forester's Sensitive Species list that was used in the original 2008 report. Some

species of animals have been added and removed from the Sensitive Species list since the 2008 FEIS.

4. Federal status has changed since the 2008 FEIS.
5. The IPNF white paper on MIS outlines a new process on the way to address these species (Appendix A).

If a species has a "No" in the *Addressed in this Supplemental Document* column then refer to the Bussel 484 Final Environmental Impact Statement (FEIS) [USDA 2008a pages 242-281] for effects analysis.

Table 3 – Wildlife Species Considered for Bussel 484 Supplemental EIS

Common Name (Scientific Name)	Current Status	Sufficient Analysis Completed in 2008	Addressed in Supplemental EIS
Woodland Caribou (*Rangifer tarandus caribou*)	Federal Endangered	Yes	No
Canada Lynx (*Lynx canadensis*)	Federal Threatened	Yes	**Yes**
Grizzly Bear (*Ursus arctos*)	Federal Threatened	Yes	No
Gray Wolf (*Canis lupus*)	R1 Sensitive	Yes	No
American Peregrine Falcon (*Falco peregrinus anatum*)	R1 Sensitive	Yes	No
Bald Eagle (*Haliaeetus leucocephalus*)	R1 Sensitive	Yes	No
Black-backed Woodpecker (*Picoides arcticus*)	R1 Sensitive	Yes	No
Black Swift (*Cypseloides niger)*	R1 Sensitive	Yes	No
Coeur d'Alene Salamander (*Plethodon idahoensis)*	R1 Sensitive	Yes	No
Common Loon (*Gavia immer*)	R1 Sensitive	Yes	No
Fisher (*Martes pennanti*)	R1 Sensitive	Yes	**Yes**
Flammulated Owl (*Otus flammeolus*)	R1 Sensitive	Yes	No
Fringed Myotis *(Myotis thysandodes)*	R1 Sensitive	Yes	No
Harlequin Duck (*Histrionicus histrionicus*)	R1 Sensitive	Yes	No
Long-eared myotis *(Myotis evotis)*	R1 Sensitive	No	**Yes**
Long-legged myotis *(Myotis volans)*	R1 Sensitive	No	**Yes**
North American Wolverine (*Gulo gulo*)	Federal Candidate R1 Sensitive	Yes	**Yes**
Northern Bog Lemming (*Synaptomys borealis*)	R1 Sensitive	Yes	No
Pygmy Nuthatch *(Sitta pygmaea)*	R1 Sensitive	Yes	No
Townsend's Big-eared Bat (*Corynorhinus townsendii*)	R1 Sensitive	Yes	No
Western Toad (*Bufo boreas*)	R1 Sensitive	Yes	No
Northern Goshawk (*Accipiter gentilis*)	MIS Indicator Species	No	**Yes**
Pileated Woodpecker (*Dryocopus pileatus*)	MIS Indicator Species	No	**Yes**

Common Name (Scientific Name)	Current Status	Sufficient Analysis Completed in 2008	Addressed in Supplemental EIS
Elk (*Cervus elaphus nelsoni*)	MIS Commonly Hunted	Yes	**Yes**
Moose (*Alces alces*)	MIS Commonly Hunted	Yes	**Yes**
Marten (*Martes americana*)	Other Species Commonly Hunted	No	**Yes**
Forest Landbird (Various species)	Other Species Common Avian Species	Yes	No
Cavity/Snag Habitat	Other Habitats	Yes	No
Disturbance/Access	Other Habitats	Yes	No
Forest Structure	Other Habitats	Yes	No
Riparian Habitat	Other Habitats	Yes	No

Federal Listed Species

The U. S. Fish and Wildlife Service (USFWS) identified four listed or proposed wildlife species that may occur on the Idaho Panhandle National Forests (Species list # 1-9-09-SP-0035, February 11, 2009 [USDI 2009a]; Federal Register [May 5, 2011]): Grizzly Bear, Woodland Caribou and Canada Lynx.

Summary of Effects for Threatened and Endangered Species

Based on the U.S. Fish and Wildlife Service letter dated February 11, 2009 which lists the threatened and endangered species that may be present on the Idaho Panhandle National Forests (Reference No. 1-9-09-SP-0035) and the Federal Register notice that removed the Northern Rockies Gray Wolf from the Threatened and Endangered Species list (Federal Register, May 5, 2011).

Species	Status	Alternative A	Alternative B	Alternative C	Location of Effects Analysis
Canada Lynx	ESA Listed Threatened	NE	NE	NE	SEIS page 12
Grizzly Bear	ESA Listed Threatened	NE	NE	NE	FEIS page 267
Woodland Caribou	ESA Listed Endangered	NE	NE	NE	FEIS page 267

NE - No Effect
NLAA - May Affect, Not Likely to Adversely Affect
LAA - May Affect, Likely to Adversely Affect
NLJ-Not Likely to Jeopardize

Canada Lynx

The Canada lynx section in the FEIS on pages 267 through 271 is replaced by the analysis of lynx that follows.

Lynx Analysis Units (LAUs) were re-delineated in 2008 on the IPNF to be consistent with the Northern Rockies Lynx Management Direction Record of Decision (NRLMD) [USDA 2007].

Affected Environment

During the LAU re-mapping using a more refined mapping process, the Grandmother Mountain LAU was found to not have sufficient habitat within the LAU to meet minimum LAU requirements; so the LAU was

dropped as outlined in SWL1 and SWL2. The Bussel 484 project area no longer occurs within a LAU (Figure 1).

Affected Environment

During the LAU re-mapping it was determined that the Grandmother Mountain LAU did not have sufficient lynx habitat within the LAU to meet minimum LAU requirements (FEIS p. 268); so the LAU was dropped as outlined in SWL-1 and SWL-2. The analysis and the modifications of the proposed actions are based on consistency with the Northern Rockies Lynx Management Direction and protecting lynx regardless of the final lynx habitat remapping. That remapping was finalized after the 2008 FEIS went to print. During remapping finalization, the Grandmother Mountain LAU was dropped. The Bussel 484 project area no longer occurs within an LAU (Figure 1).

Affected Environment

During the LAU re-mapping, the Grandmother Mountain LAU did not have sufficient habitat within the LAU to meet minimum LAU requirements; so the LAU was dropped as outlined in SWL1 and SWL2. The Bussel 484 project area no longer occurs within a LAU (Figure 1).

Environmental Consequences

Alternative A

Direct, Indirect and Cumulative Effects

No activities are proposed with this alternative, so there would be no direct or indirect effects to lynx or their habitat. There are no current or reasonably foreseeable federal actions in the analysis area that would measurably affect lynx or their habitat.

Alternatives B & C

Direct and Indirect Effects

Alternatives proposed with the Bussel 484 project would have *No Effect* on lynx or their habitat because project activities would be outside of any LAU. The Bussel 484 project area had been in part of the Grandmother Mountain LAU, but that LAU was removed when LAUs were redelineated on the Idaho Panhandle National Forests. The Bussel 484 project is outside of any LAU and identified lynx habitat (Figure 1), therefore, there are no expected effects to lynx.

Figure 1 below shows the current LAUs on the St. Joe Ranger District. LAU boundaries and mapped lynx habitat were based on recent research and recommendations by the Lynx Biology team (SWL1); and the process they followed can be found in the project file (SWL2). The Regional Office staff reviewed the updates to the LAUs and found them to be consistent with NRLMD standards (SWL3). This happened when the Final EIS was at the printer, so the mapping that removed the Grandmother Mountain LAU was not incorporated in the FEIS.

The scale of LAUs should approximate the size of area used by an individual lynx, and are intended to provide the smallest scale to evaluate the effects of management actions on lynx habitat (Ruediger and others 2000 p.7-2).

On March 27, 2009, the U.S. Fish and Wildlife Service (FWS) finalized critical habitat designation for Canada lynx (USDI 2009b). No critical habitat was designated on the St. Joe Ranger District. On July 28, 2010, the United States District Court for the District of Montana issued an opinion which concluded that the FWS's February 2009 revised final rule designating approximately 39,000 acres in Maine, Minnesota, Montana, Idaho, Washington, and Wyoming as critical habitat for the Canada lynx violated the Endangered Species Act (ESA). FWS is preparing a new rule addressing the ESA violations.

Affected Environment

During the LAU re-mapping, the Grandmother Mountain LAU did not have sufficient habitat within the LAU to meet minimum LAU requirements; so the LAU was dropped as outlined in SWL1 and SWL2. The Bussel 484 project area no longer occurs within a LAU (Figure 1).

Environmental Consequences

Alternative A

Direct, Indirect and Cumulative Effects

No activities are proposed with this alternative, so there would be no direct or indirect effects to lynx or their habitat. There are no current or reasonably foreseeable federal actions in the analysis area that would measurably affect lynx or their habitat.

Alternatives B & C

Direct and Indirect Effects

Alternatives proposed with the Bussel 484 project would have *No Effect* on lynx or their habitat because project activities would be outside of any LAU. The Bussel 484 project area had been in part of the Grandmother Mountain LAU, but that LAU was removed when LAUs were redelineated on the Idaho Panhandle National Forests. The Bussel 484 project is outside of any LAU and identified lynx habitat (Figure 1), therefore, there are no expected effects to lynx.

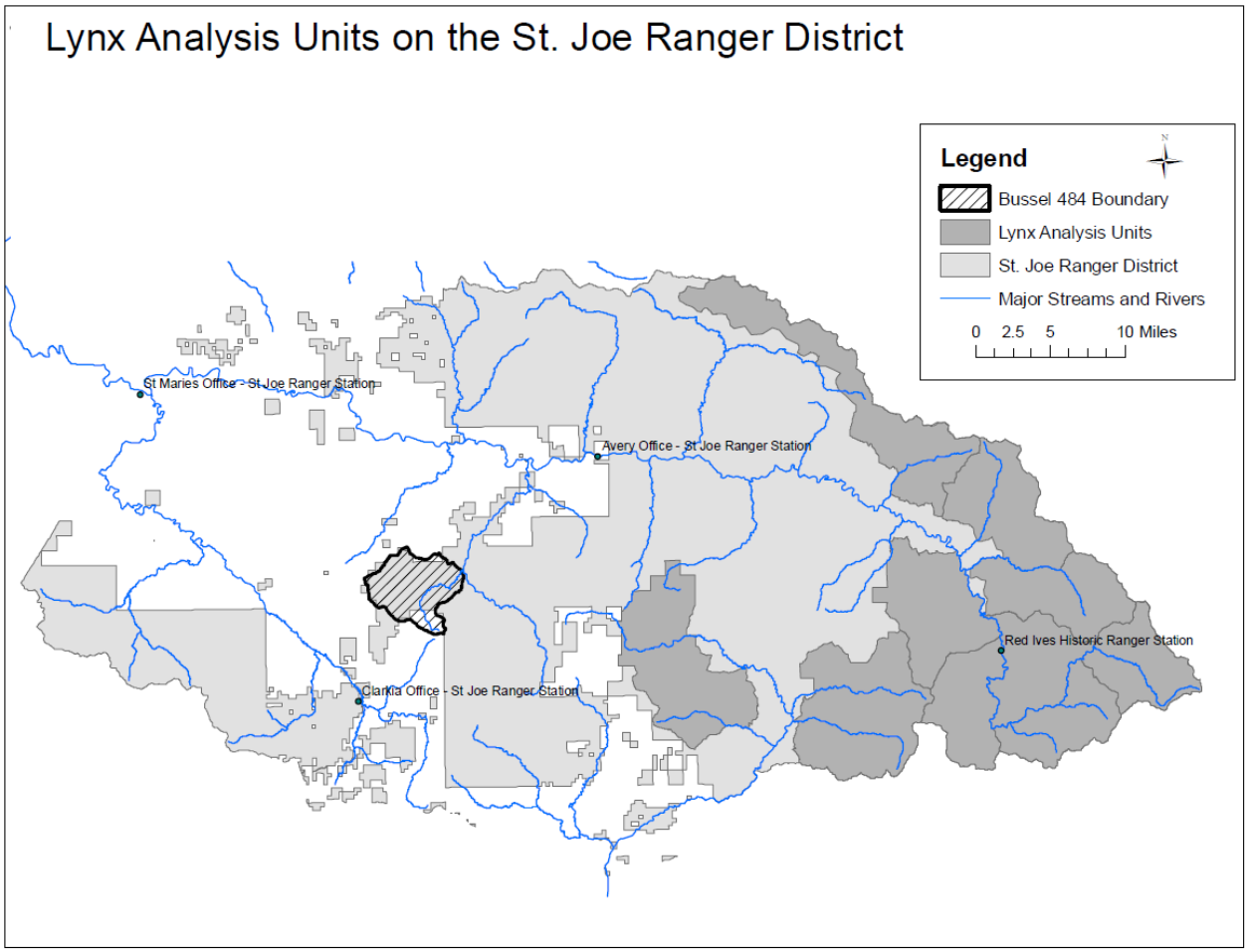

Figure 1 - Current Lynx Analysis Units in Relation to the Bussel 484 Project Area

Cumulative Effects

Activities proposed for the Bussel 484 project would not incrementally add to cumulative effects as there are no effects identified with any alternative for Canada lynx.

Sensitive Species

The Regional Forester Sensitive species list was updated in February of 2011 and will take effect May 27, 2011 (USDA 2011).

Summary of Effects for Sensitive Species

Based on the Regional Foresters list as of May 27, 2011 (list per R1 Regional Forester's letter dated February 25, 2011).

Species	Alternative A	Alternative B	Alternative C	Location of Effects Analysis
American Peregrine Falcon	NI	NI	NI	FEIS pages 247-248
Bald Eagle	NI	NI	NI	FEIS page 247
Black-backed Woodpecker	NI	MIIH	MIIH	FEIS pages 277-278
Black Swift	NI	NI	NI	FEIS page 248
Coeur d'Alene Salamander	NI	MIIH	MIIH	FEIS pages 278-279
Common Loon	NI	NI	NI	FEIS page 246
Fisher	NI	MIIH	MIIH	SEIS page 17
Flammulated Owl	NI	NI	NI	FEIS page 247
Fringed Myotis	NI	NI	NI	FEIS page 247
Gray Wolf	NI	MIIH	MIIH	FEIS pages 272-274
Harlequin Duck	NI	NI	NI	FEIS page 246
Long-eared Myotis	NI	MIIH	MIIH	SEIS page 21
Long-legged Myotis	NI	MIIH	MIIH	SEIS page 21
North American Wolverine	NI	NI	NI	SEIS page 23 and FEIS pages 276-277
Northern Bog Lemming	NI	NI	NI	FEIS page 246
Pygmy Nuthatch	NI	NI	NI	FEIS page 247
Townsend's Big-eared Bat	NI	NI	NI	FEIS page 248
Western Toad	NI	MIIH	MIIH	FEIS pages 279-280

NI - No Impact

MIIH- May Impact Individuals or Habitat, But Will Not Likely Contribute to a Trend Towards Federal Listing or Loss of Viability to the Population or Species

WIFV- Will Impact Individuals or Habitat With a Consequence That The Action May Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species

BI - Beneficial Impact

PREPARED BY: Kristopher Hennings DATE May 5, 2011

Fisher

The fisher section in the FEIS on pages 274 through 276 is replaced by the analysis of fisher that follows.

The fisher has been petitioned for listing as a threatened or endangered species and is currently undergoing a status review by the USFWS. Fisher is a Species of Greatest Conservation Need under the Idaho Comprehensive Wildlife Conservation Strategy (Idaho Department of Fish and Game 2005). They prefer late-seral stage coniferous and mixed forest habitat. Fisher use riparian habitats as resting sites and extensively for travel. It appears that fisher avoid high elevations (> 4,000 ft.) and non-forested areas (Ruggiero and others 1994). Extensive alteration of forest structure through logging (i.e. reduction in canopy closure, snags, and down woody material) may reduce its habitat value for fisher (Heinemeyer and Jones 1994).

Geographic Scope and Methodology

The analysis uses management guidelines from *Fisher Biology and Management in the Western United States* (Heinemeyer and Jones 1994). The percent of the area in mature/old forest structure (i.e. suitable habitat) is displayed and compared to the guidelines. Changes from the existing condition relative to guidelines for forest structure are discussed. The goal at the scale of this analysis (i.e. the Bussel 484 Wildlife Analysis Area or “subdrainage”) is to maintain functional home ranges (Heinemeyer and Jones 1994).

Fishers are vulnerable to trapping (Heinemeyer and Jones 1994). The Forest Service has no jurisdiction concerning trapping; and it is beyond the scope of this project analysis. High quality habitats for fisher are not necessarily strongly associated with low levels of human populations and roads (Carroll and others 2001). However, road densities are associated with vulnerability (to trapping) and changes in road density are displayed.

Affected Environment

In 2007, eight forest carnivore bait stations were placed in the Bussel 484 project area; no fishers were detected at that time (Albrecht and Heusser 2009). In 2008, wildlife personnel on the St. Joe set 12 forest carnivore bait stations within the Bussel 484 project area. During those surveys two fishers were detected in the project area (SWL-4).

Vegetation/Habitat

Late-successional habitat is an essential component of fisher habitat. The physical structure of the forest appears to be more important for fisher than the species composition (Ruggiero and others 1994).

Habitat management considerations for fisher emphasize maintaining late-successional forest habitat. Mature riparian forest is especially important for denning sites and travel ways for fisher. Based on habitat requirements, the quality, amount, and distribution of late successional forest habitat within the drainage is considered the most important factor for fisher.

There are approximately 12,184 acres of capable fisher habitat in the Bussel 484 Wildlife Analysis Area (WL-3). There are approximately 2,779 acres of mature/sawtimber size habitat and approximately 2,588 acres that provide currently suitable fisher denning habitat.

The existing condition of forested habitat on NFS lands in the Bussel 484 Wildlife Analysis Area and the guidelines for forest structure by subdrainage are displayed in

Table 4.

Table 4 – Fisher Guidelines for Forest Structure

Forest Structure	Existing Condition*		Subdrainage Guidelines		
			High Quality	Moderate Quality	Low Quality
Mature/Sawtimber	2,779a	23%	65-75%	>40%	30-40%
Immature Sawtimber	7,024a	57%	10-25%	na**	na
Pole/sapling	2,172a	18%	10-25%	na	na
Open/seed	293a	2%	na	na	na

* Percent of capable habitat in the wildlife analysis area

** not applicable – no guidelines identified

Based on the amount of mature/sawtimber forest structure, the existing condition of the Bussel 484 Wildlife Analysis Area is below the criteria needed for a low-quality subdrainage. This is due primarily to the fire and harvest history that results in the majority of the stands being classified as immature sawtimber. See the discussion in the *Forest Vegetation* section of the FEIS (pages 131-144).

In addition to the 2,779 acres of mature/sawtimber habitat, approximately 4,246 acres of immature sawtimber size forest stands have a number of large trees (>20/acre at least 14-15 inches d. b. h.) that may also provide suitable fisher habitat (WL-3). Based on field review, some of these stands appear to provide suitable habitat for fisher. Based on these figures, there are as many as 7,025 acres (58% of NFS capable habitat) of suitable fisher habitat in the wildlife analysis area. When these additional stands are considered, the existing condition of the analysis area would meet the criteria for a moderate-quality subdrainage. The landscape surrounding the analysis area to the southwest and west around to the northeast is primarily non-NFS land that does not or likely will not provide much mature or late successional forest within the foreseeable future. The analysis is based on the impacts on mature/sawtimber and immature sawtimber sized stands.

Impacted riparian zones are also affecting existing fisher habitat. See the pages 253 and 254 of the FEIS for discussion on effects on riparian habitat.

Access/Vulnerability Risk

While it is not legal to trap fishers in Idaho, other forest carnivores can be legally trapped so there is some vulnerability. Trapping-vulnerability risk has been cited as one of the factors affecting forest carnivores in Idaho (Heinemeyer and Jones 1994). However, human impacts (e.g. roads) have not been significant variables in regional-scale models (Carroll and others 2001). Roads are correlated with trapping vulnerability and human disturbance. In areas having fisher trapping seasons road densities greater than or equal to 1 mi/mi^2 have a high risk to trapping vulnerability for fisher.

Roads and trails used by motorized vehicles have the greatest impact on wildlife (Wisdom and others 2004; Gaines and others 2003) and provide the most access for trapping. The existing motorized road/trail density in the Bussel 484 Wildlife Analysis Area is 3.4 mi/mi^2.

Environmental Consequences

Alternative A

Alternative A would have *No Impact* on fishers.

Direct and Indirect Effects

This alternative would not affect suitable mature forest habitat.

Cumulative Effects

Existing suitable habitat is a result of all past activities and disturbances. Succession of immature sawtimber stands would at some undetermined future date result in a minimum of 77% of the analysis area in mature/sawtimber. This would meet the criteria for a high-quality subdrainage. Road density would remain at a level considered a high risk to trapping vulnerability.

Alternatives B & C

Alternatives B and C *May Impact* fisher individuals or habitat, but will not likely contribute to a trend towards federal listing or loss of viability to the population or species. Mature forest habitat would be reduced by 2% in the project area leaving approximately 2,613 acres of habitat remaining post activities. Fisher use has been documented in the project area, and a 2% reduction of mature habitat is not expected to preclude fisher use during or after project implementation when the existing condition of the analysis area meets the criteria for a moderate-quality subdrainage.

Direct and Indirect Effects

A total of approximately 256 acres (255 acres harvest and 0.4 acres road construction) of mature forest and 1,891 acres (1,889 acres of harvest and 2 acres of road construction) of young forest (immature sawtimber and pole-size stands) would be impacted. This would reduce mature forest habitat by 167 acres (166 acres from harvest and 0.4 acre from road construction) and reduce immature sawtimber (i.e. young forest) by 235 acres (233 from harvest and 2 from road construction). The 89 acres of partial harvest in mature forest would result in a total or partial loss of suitable fisher denning habitat until the habitat attributes (e.g. down wood) are restored through forest succession because trees would continue to grow, decline, then fall. The 1,656 acres of partial harvest in immature sawtimber forest would retain the future suitability of the treated stands because an adequate number of trees would remain and would continue to grow larger.

Cumulative Effects

Existing suitable habitat is a result of all past activities and disturbances which include those discussed in the FEIS on pages 43-49. Succession of immature sawtimber stands would at some undetermined future date result in a minimum of 77% of the analysis area in mature/sawtimber. This would meet the criteria for a high-quality subdrainage. Road density would remain at a level considered a high risk to trapping vulnerability. However, in all action alternatives there would be a reduction in road/trail densities, but human-impacts (e.g. roads) have not been significant variables in regional-scale models (Carroll and others 2001).

Fisher Comparison of Alternatives

The following two tables compare the alternatives by variables that affect fisher.

Vegetation/Habitat for Fisher

Table 5 – Acres and Percent of Forest Structure by Alternative

Forest Structure	Alternative A		Alternatives B & C	
Mature/Sawtimber	2,779a	23%	2,613a	21%
Immature Sawtimber	7,024a	57%	6,791a	55%
Pole/Sapling	2,172a	18%	2,172a	18%
Open/Seed	293a	2%	722a	6%

Access/Vulnerability Risk

Table 6 – Effects on Road Density (miles/mile^2)

	Alternative A	Alternative B	Alternative C
Road/Trail Density	3.4	2.2	2.1

Long-eared and Long-legged Myotis

The long-eared and long-legged myotis are new additions to the Regional Forester's list for the Idaho Panhandle National Forest (USDA 2011). These species were not on the Sensitive Species list when the Bussel 484 FEIS was completed.

Long-eared myotis roost under bark, in tree cavities, in abandoned buildings and in crevices in cliffs (Romin & Bosworth 2010). This bat prefers Douglas-fir for roosting but will occasionally use western hemlock and western redcedar (Arnett and Hayes 2009). The species is also associated with stumps and high snag densities (Ibid). The western long-eared myotis is thought to hibernate in moist caves and mines. It was found in northeastern Washington using rock outcrops for maternity sites (Rancourt and others 2005). The western long-eared myotis forages throughout the night and also gleans insects from vegetation on the ground (Ibid). Their diet consists of small beetles, moths and other insects.

The home ranges of the long-eared myotis are small, usually less than five acres (Nixon and others 2009). However, infrequently the home ranges can be as large as 12 acres (Ibid).

The western long-eared myotis is one of the most widely reported bats in northern Idaho (Ibid). During mining adit surveys long-eared bats are commonly captured on the St. Joe Ranger District (SWL-5).

Long-legged myotis roost under exfoliating tree bark, cavities and snags during the summer and hibernate in caves and mines. It feeds primarily on moths. They have been found in mature forests using grand fir, ponderosa pine, Douglas-fir and aspen (Romin & Bosworth 2010). This bat also occasionally uses western hemlock and western redcedar (Arnett and Hayes 2009). These bats have been found in north central Idaho using managed forests with trees that range from 5 to 15 inches in diameter. They generally used snags with an average diameter of 21" in Idaho (Johnson and others 2007).

Males have the largest variation in home ranges. In north central Idaho male long-legged myotis had home ranges that varied from 41 acres to 7,485 acres (Johnson and others 2007).

During adit surveys long-legged myotis are commonly captured on the St. Joe Ranger District (SWL-5).

Affected Environment

Bat surveys usually occur at mining adits or cave openings. Since there are no known adits or caves within the project area, no bat surveys have been conducted in the project area.

There are no known abandoned buildings, abandoned mines, or caves in the wildlife analysis area that may serve as potential habitat for the long-eared or long-legged myotis.

Rock outcrops occur throughout the project area, especially in the Bussel Creek drainage. While potential habitat exists, Bussel 484 project activities would not alter rock out crop habitat.

Long-eared and long-legged myotis snag habitat occurs throughout the project area at various levels.

Environmental Consequences

Alternative A

Alternative A will have *No Impact* on Long-eared and long-legged myotis.

Direct and Indirect Effects

Alternative A would not affect suitable snag habitat.

Cumulative Effects

Existing cavity and snag habitat is a function of past and present disturbances (e.g. fire, insects, disease, and timber harvest), stand initiation, and succession. The existing condition of cavity habitat is reduced from 100% of potential but occurs at a level (77%) that exceeds Forest Plan standards (40-60% of potential). Forest Plan standards for cavity nesting species would be met or exceeded in all alternatives. There is a relatively low amount of forest structure (i.e. 23% of wildlife analysis area) with reduced cavity habitat potential due to past activity and/or natural conditions (WL-3). This includes brush/seedling/ sapling/pole stands and larger size classes with past harvest activity that may have reduced the cavity habitat potential. Conversely, there is a relatively large amount of sawtimber/mature sawtimber and immature sawtimber forest structure (77% of wildlife analysis area) well distributed in the analysis area (WL-3).

Foreseeable activities that could impact snags include roadside hazards, fire suppression, and salvage. Road developments influence snag levels by increasing the amount of area considered during road-side hazard tree assessments. Personal use firewood cutting will also continue to influence snag densities and distributions on the district.

Alternatives B & C

Alternatives B and C *May Impact* Long-eared and long-legged myotis individuals or habitat, but will not likely contribute to a trend towards federal listing or loss of viability to the population or species. Snags are not targeted for removal and only limited numbers of snags would be lost due to timber harvest and associated activities. In addition, areas outside of proposed treatment units would continue to provide snags at existing levels. Adequate habitat would remain and long-eared and long-legged bats are commonly found during surveys across the St. Joe Ranger District.

Direct and Indirect Effects

Snag removal is no longer a standard logging practice. In fact, design features based on Regional guidance, such as the Northern Region Snag Management Protocol (USDA Forest Service 2000) and the Estimates of Snag Densities for Northern Idaho Forests (Bollenbacher and others 2009) have greatly improved the retention of quality snags and live trees to serve as future snags. Specifications contained in timber sale contracts also typically require the retention of all or most snags, particularly large diameter ones, except those needing to be removed for safety purposes due to Occupational Health and Safety Administration (OSHA) guidelines (Appendix A, page 5).

In both action alternatives, it is expected that limited numbers of some snags would be lost due to timber harvest and associated activities. However, areas outside of proposed treatment units would continue to provide snags at existing levels in the short term and the number of snags in these areas would increase as stands succeed. Snags that occur within riparian habitat conservation area (RHCA) buffers would also be maintained at existing levels, and as succession occurs more snags would be recruited, therefore cavity habitat is expected to remain near existing levels.

Cumulative Effects

Existing cavity and snag habitat is a function of past and present disturbances (e.g. fire, insects, disease, and timber harvest), stand initiation, and succession. The existing condition of cavity habitat is reduced from 100% of potential but occurs at a level (77%) that exceeds Forest Plan standards (40-60% of potential). Forest Plan standards for cavity nesting species would be met or exceeded in all alternatives.

There is a relatively low amount of forest structure (i.e. 23% of wildlife analysis area) with reduced cavity habitat potential due to past activity and/or natural conditions (WL-3). This includes brush/seedling/ sapling/pole stands and larger size classes with past harvest activity that may have reduced the cavity habitat potential. Conversely, there is a relatively large amount of sawtimber/mature sawtimber and immature sawtimber forest structure (77% of wildlife analysis area) well distributed in the analysis area (WL-3).

Some additional snags (i.e. bat habitat) would be lost due to timber harvest and associated activities. However, the potential impacts on snags are alleviated by a number of factors. Areas outside of proposed treatment units would continue to provide snags at existing levels in the short term and the number of snags and down woody material in these areas would increase as stands succeed. Areas would be reserved from treatment within riparian habitat conservation area (RHCA) buffers. Design features of the project were devised – based on the Northern Region Snag protocol (USDA 2000). Snags and snag replacements would be retained in all treatment units at levels recommended by scientific literature based on recent studies (12 per acre in most units) which would exceed Forest Plan standards of three to four per acre. While acknowledging notable differences, the commercial thin treatments and design features for snag retention are similar to treatments that have been shown to maintain cavity habitat and wildlife use (Quesnel and Steeger 2002).

Foreseeable activities that could reduce the number of snags include removal of roadside hazards, fire suppression, and firewood removal. Road developments influence snag levels by increasing the amount of area considered during road-side hazard tree assessments. Personal use firewood cutting would also continue to influence snag densities and distributions on the district.

The combination of potential snag loss from project activities and foreseeable activities would be a slight reduction of snags.

North American Wolverine

In December of 2010 the US Fish and Wildlife Service published their 12-month finding on a petition to list the North American wolverine. After review, the US Fish and Wildlife Service found that the North American wolverine occurring in the contiguous United States is a distinct population segment (DPS) and addition of the DPS to the Lists of Endangered and Threatened Wildlife and Plants is warranted, but is precluded by higher priority actions at this time (USDI 2010b). This finding places the wolverine on the US Fish and Wildlife's candidate species list.

For effects analysis for wolverines see FEIS pages 276 and 277. There are no changes to the anticipated effects for any alternative.

Management Indicator Species

The *Management Indicator Species Considerations for the Idaho Panhandle National Forests* (Appendix A) white paper discusses the management indicator species (MIS) process on the IPNF. Selection of MIS included three categories: (1) Threatened or endangered species on federal or state lists; (2) Species commonly hunted, fished, or trapped which have special habitat needs that are affected by planned management activities, and (3) Other species whose population changes are believed to indicate

effects of management activities on a major biological group or on water quality. This category will be referred to as “Indicator Species" and includes northern goshawk and pileated woodpecker.

The majority of the white paper focuses on northern goshawk and pileated woodpecker and provides a step-down process, based on best available science, for these species. Existing condition, population and habitat availability at various scales including National, Regional, State and Forest-level are discussed for both species. The Regional and Forest trends discussed provide a larger context to these species. This paper also includes the potential threats to these species and their habitat, as well as the difficulties in monitoring. The following project-level analysis is based on the scientific findings cited in this supplemental EIS and provides a step down process from the larger context covered in the white paper.

Summary of Effects on Management Indicator Species (MIS)

MIS were identified in the Idaho Panhandle National Forest Plan (USDA 1987 p. L-4 through L-6).

Species	Status	Alternative A	Alternative B	Alternative C	Location of Effects Analysis
Northern Goshawk	Indicator Species	NI	MI	MI	SEIS page 24
Pileated Woodpecker	Indicator Species	NI	MI	MI	SEIS page 28
Elk	Commonly Hunted	NI	MI	MI	SEIS page 33 FEIS pages 264-266
Moose	Commonly Hunted	NI	MI	MI	SEIS page 33 FEIS page 248

NI – No Impact
MI-May Impact Individuals or Habitat
MC- May Contribute to Loss of Population Viability

Indicator Species

Northern Goshawk

The goshawk section in the FEIS on pages 260 through 264 is replaced by the analysis of goshawks that follows.

Goshawks use a variety of forest types, structures, and successional stages, and have been primarily associated with late-successional habitat. For nesting, goshawks utilize mature to old growth stands on gentle to moderately steep slopes (Kennedy 2003). Forest habitat that provides prey species and which is open enough to allow unimpeded flight through the understory is considered suitable for foraging.

The analysis of effects on goshawks uses direction in *Old-Growth Habitats and Associated Wildlife Species in the Northern Rocky Mountains* (USDA 1990), *Management Recommendations for the Northern Goshawk in the Southwestern United States* (Reynolds and others 1992), *Northern Goshawk, Northern Region Overview, Key Findings and Project Considerations* (Brewer and others 2007), and *A Conservation Assessment of the Northern Goshawk, Black-backed Woodpecker, Flammulated Owl, and Pileated Woodpecker in the Northern Region, USDA Forest Service* (Samson 2006a) to assess potential effects. The analysis is based on the analysis done for size class (see *FEIS, pages 250 through 253*).

Geographic Scope and Methodology

Goshawk territory sizes range from approximately 1,235 to 9,880 acres (Samson 2006a). Assessment areas of 5,000 acres at a minimum (USDA 1990) and 5,400 acres not including nest areas, post fledging area, and natural or created openings (Reynolds and others 1992) are recommended for evaluation of potential goshawk suitability. For this analysis, two assessment areas within the wildlife analysis area were delineated based on topographic features and existing stand boundaries (Figure 2). These assessment areas represent hypothetical goshawk home ranges. For analysis purposes the assessment areas are entirely within the Bussel 484 Wildlife Analysis Area, actual goshawk home ranges may include areas outside of the analysis area.

Management recommendations for each home range include approximately three suitable nest areas and three replacement areas (in a developmental phase) per home range and a mosaic of vegetation structural stages in both an approximately 420-acre Post-fledging Family Area (PFA) and an approximately 5400-acre foraging area (Reynolds and others 1992).

Affected Environment

Potential goshawk habitat within the Bussel 484 project area was surveyed in 2002 with broadcast calls and did not result in any confirmed goshawks (WL-22). Although, locating goshawks during breeding season can be difficult (Appendix A, page 12).

Three incidental sightings of goshawks occurred during field review of the Bussel 484 project area (WL-44, SWL-6). Follow up searches by wildlife personnel located an individual goshawk in the south east portion of the project area and a nest just north of the project area (SWL-6, SWL-7).

In 2008 wildlife personnel completed a follow-up search at the location where the pair of goshawks was seen in 2007 (WL-44). During the follow-up a nest was located that had one fledgling in it approximately 700 feet outside of the Bussel 484 project area (SWL-7).

In 2009, the nest visit confirmed an inactive nest for the year (SWL-7). Again in 2010, the site was visited. The tree the nest was located in had died and the nest had blown out of the tree. Wildlife personnel searched the surrounding area and were able to locate at least one fledged young, but no new nest location (SWL-7). Goshawk activity observed in the area from 2007 through 2010 confirm an active goshawk territory with alternate nest sites.

Based on literature descriptions (USDS 1990; Reynolds and others 1992; Kennedy 2003; Samson 2006a, and Brewer and others 2007), there is capable and suitable habitat available within the Bussel 484 Project Area.

Potential nest areas include: mature/sawtimber forest structure, old growth, and stands classed as immature with at least 20 trees per acre greater than 14 inches d.b.h.; these criteria are consistent with literature descriptions of nest habitat (USDS 1990; Reynolds and others 1992; Kennedy 2003; Samson 2006a, and Brewer and others 2007) and direction (Brewer and others 2007). An additional criterion for percent slope < 40% was also applied in this analysis (USDA 1990). Although more restrictive than nesting criteria in some literature this criterion does not limit the suitability of the assessment areas based on availability of nesting habitat. A subset of potential habitat was field checked to ensure mapped habitat matched current field conditions (WL-2). Table 7 shows the existing condition for goshawks.

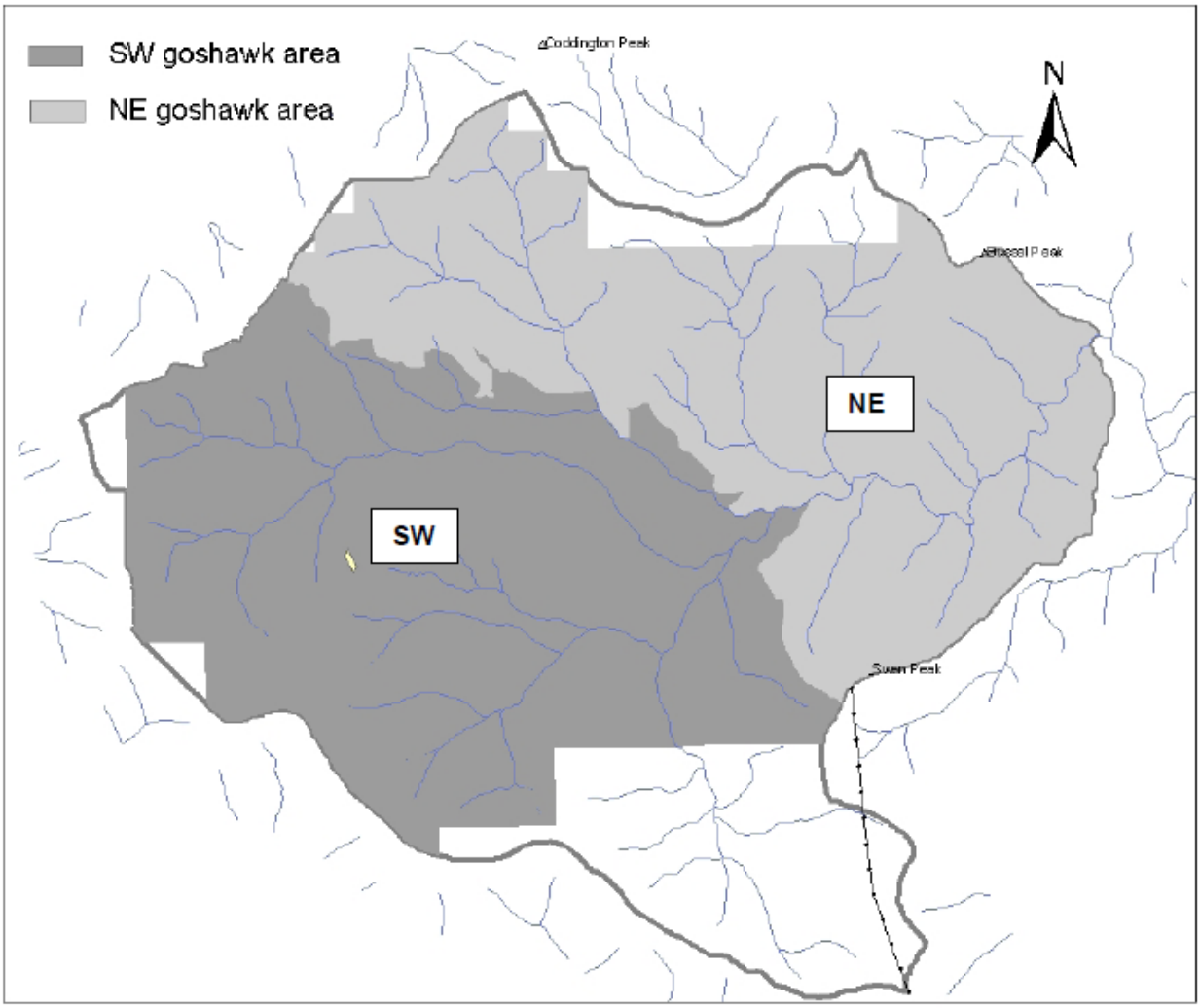

Figure 2 – Goshawk Analysis Area

Table 7 – Existing and Recommended Conditions for Goshawk

Area	Area Acres	Potential Nest Areas*	Forage Area Vegetation Structure							
			Existing acres and % of the area				Management Recommendations			
			Grass Shrub	Seed/ Sapling	Pole	Mid/ Old	Grass Shrub	Seed/ Sapling	Pole	Mid/ Old
Bussel 484 SW	6,487a	18+	119a 2%	462a 7%	816a 13%	5,089a 78%	10%	10%	20%	60%
Bussel 484 NE	5,704a	19+	173a 3%	488a 9%	367a 6%	4,676a 82%				

**The exact number of potential nest areas depends on how patches of at least 40 acres in size are counted. These values represent a minimum number based on a conservative approach when assessing nest areas.*

An assessment of conditions in an approximately 450-acre area surrounding each potential nest stand revealed that the SW area has 8 nest stands with hypothetical PFAs that meet recommendations for vegetative conditions and the NE area has 11 nest stands that meet the recommendations (WL-23).

Environmental Consequences

Alternative A

Direct, Indirect and Cumulative Effects

This alternative would not impact forest habitat in either of the goshawk home ranges. It would maintain middle-aged to old forest habitat (i.e. those with the higher forage value) in excess of the recommended 60% in each goshawk analysis area. Alternative A would maintain sufficient nesting habitat well distributed throughout each goshawk analysis area with potential PFAs (Table 8).

Alternatives B & C

Direct and Indirect Effects

Both action alternatives would maintain middle-aged to old forest habitat (i.e. those with the higher forage value) in excess of the recommended 60% in each goshawk analysis area. Alternatives B & C would maintain sufficient nesting habitat well distributed throughout each goshawk analysis area with potential PFAs (Table 8).

In each alternative the amount of seedling/sapling size would move above recommended levels in both goshawk analysis areas. This is not expected to affect the suitability of the analysis area to support a breeding pair of goshawks - as evidenced by known active nests in areas with high percentage of seedling/sapling elsewhere on the District and the amount of immature sawtimber and sawtimber size classes retained. Goshawk foraging habitat will have sustainable and abundant prey when the majority of forage are in the older age classes (Reynolds and others 1992). Older age classes of forest structure provide the most prey species at higher population levels (ibid) and provide higher forage habitat values for goshawks (USDA 1990). There are approximately 133 acres in the SW Goshawk Analysis Area and approximately 342 acres in the NE Goshawk Analysis Area typed as sapling size class that will succeed to the pole size class within a few years (± 5 years). The proposed pre-commercial thinning would increase the rate at which this succession to pole size class stands occurs. Based on the higher forage value of immature sawtimber vs. sapling size classes and the impending succession of existing sapling stands the increase (short term) in seedling/sapling size class would not adversely affect the suitability of either analysis area to support goshawks - now or in the future.

As outlined in the FEIS (page 37), goshawk nests found before and during implementation would have a 40-acre no-activity buffer and the PFA would be seasonally restricted from April 15 to August 15. The design criteria would minimize impacts to known nesting sites.

Cumulative Effects

Based on the project design criteria, mitigation measures, and availability of existing suitable habitat (which is a result of all past activities and disturbances); there would be no effect on goshawk populations in either of the goshawk analysis area. There would be no cumulative effects associated with this project or analysis area that would jeopardize populations of northern goshawks. This is based on the limited effects from this project, documented goshawk activity in and near the project area, the stable and well-distributed population, and adequate amounts of habitat in the project area and across the IPNF.

Based on the best available science summarized in the Management Indicator Species Considerations for the Idaho Panhandle National Forests (Appendix A), the northern goshawk population trend appears to be stable and their habitat is abundant and well-distributed across the Region. Additionally, the IPNF contains substantially more than enough habitat distributed throughout the Forest to support a minimum viable population of northern goshawk. Northern goshawks and active nest sites are documented across the Forest, including territories that have had multiple years of documented occupancy and reproductive

success, and surveys periodically locate new territories and nest sites. See Appendix A for additional information on goshawks.

Goshawk Comparison of Alternatives

The following table summarizes the recommended habitat conditions for each goshawk analysis area and shows how the alternatives compare to those conditions (WL-6).

Table 8 – Goshawk Recommended Condition and Predicted Conditions for All Alternatives

Habitat	Recommended	Alternative A		Alternatives B & C	
SW Area					
# Nest Areas	6*	8**		7**	
	% of area	Acres	%	Acres	%
Grass/Shrub	10	119	2%	119	2%
Seed/Sap	10	462	7%	704	11%
Pole	20	816	13%	816	13%
Mid/Old**	60	5,089	78%	4,847	75%
NE Area					
# Nest Areas	6*	11**		9**	
	% of area	Acres	%	Acres	%
Grass/Shrub	10	173	3%	173	3%
Seed/Sap	10	488	9%	650	11%
Pole	20	367	6%	367	6%
Mid/Old**	60	4,676	82%	4,514	79%

** Recommendation is for 3 suitable and 3 replacement (Reynolds and others 1992) and 6 (Brewer and others 2007)*
*** nest areas with suitable PFAs*

Pileated Woodpecker

The pileated woodpecker section in the FEIS on pages 257 through 260 is replaced by the analysis of pileated woodpeckers that follows.

Pileated woodpeckers are often associated with late successional forests but they also use young and fragmented forests with abundant remnant old structure (Bull and Jackson 1995). Pileated woodpeckers require tall, large-diameter dead or living defective trees within forested stands for nesting (USDA 1990a). Nest tree size has been identified as a minimum diameter of 15” (Samson 2006a) to 20” (USDA 1990) with no upper limit. With a median dispersal distance of 148 miles, habitat/territory distribution at this project level or at the Forest level is not an issue (Samson 2006a). Carpenter ants make up the bulk of their diet. Feeding habitat includes large snags with advanced decay, the moist decaying butts of live trees, logs greater than 10 inches diameter, and natural or cut stumps. Large trees, canopy cover, and the number and size of feeding sites (e.g. dead trees greater than 10 inches diameter) are all important features of quality pileated habitat (USDA 1990). Activities that reduce these habitat features may affect pileated habitat suitability.

Geographic Scope and Methodology

The analysis of effects on pileated woodpeckers is based on habitat associations and direction in *Old-Growth Habitat and Associated Wildlife Species in the Northern Rocky Mountains* (USDA 1990) and *A Conservation Assessment of the Northern Goshawk, Black-backed Woodpecker, Flammulated Owl, and Pileated Woodpecker in the Northern Region, USDA Forest Service* (Samson 2006a) and other scientific literature (Bull and Jackson 1995). This analysis is based on the analysis done for size class and old growth (FEIS pages 151 through 154 and 250 through 253). The geographic scope for direct, indirect, and cumulative effects is the wildlife analysis area; however, due to the spatial location of existing nesting habitat some habitat outside of the analysis area has been included in the analysis for some home ranges.

For analysis purposes a total of eight home ranges (see Figure 3) were delineated. All eight of these home ranges contain sufficient nesting and feeding habitat to support a breeding pair of pileated woodpeckers. Portions of some home ranges extend beyond the wildlife analysis area due to the spatial distribution of existing nesting habitat and to more accurately represent existing conditions and potential effects. When needed to determine viability of these home ranges, conditions outside of the analysis area were considered.

Habitat suitability models were used to identify potential suitable habitat. Then a subset of potential habitat was field checked to ensure habitat suitability models depict habitat on the ground (WL-2, WL-3).

TSMRS/FSVeg data and habitat values based on the HSI models (USDA 1990) were used to identify potentially suitable habitat and assess the potential for effects (WL-3, WL-11). The analysis displays a comparison of potential effects on hypothetical home ranges using habitat associations based on literature descriptions of habitat and index values from the HSI model (WL-21). Field review was conducted to verify the habitat associations used for the analysis (WL-2, WL-3).

The analysis methodology for determining potential effects on pileated woodpeckers involved mapping old growth and mature forest stands (i.e. suitable nesting habitat) in the wildlife analysis area and delineating hypothetical 1,000-acre home ranges based on the distribution of suitable nesting stands/groups of stands (Figure 3).

Based on relative habitat values and the acres of suitable nesting habitat a home range should have (USDA 1990, WL-21), areas with at least 100 acres of contiguous mature and/or old growth forest habitat and an additional contiguous 100 acres of immature/sawtimber size tree habitat were identified as having sufficient suitable habitat.

Once home ranges with suitable nest stands were identified, the suitability of surrounding stands in the home range to provide adequate feeding habitat was evaluated. Within each home range at least 500 acres of sawtimber/mature sawtimber forest and/or immature sawtimber habitat is needed to provide adequate feeding habitat (USDA 1990). Potential impacts on suitable habitat were then determined for each home range.

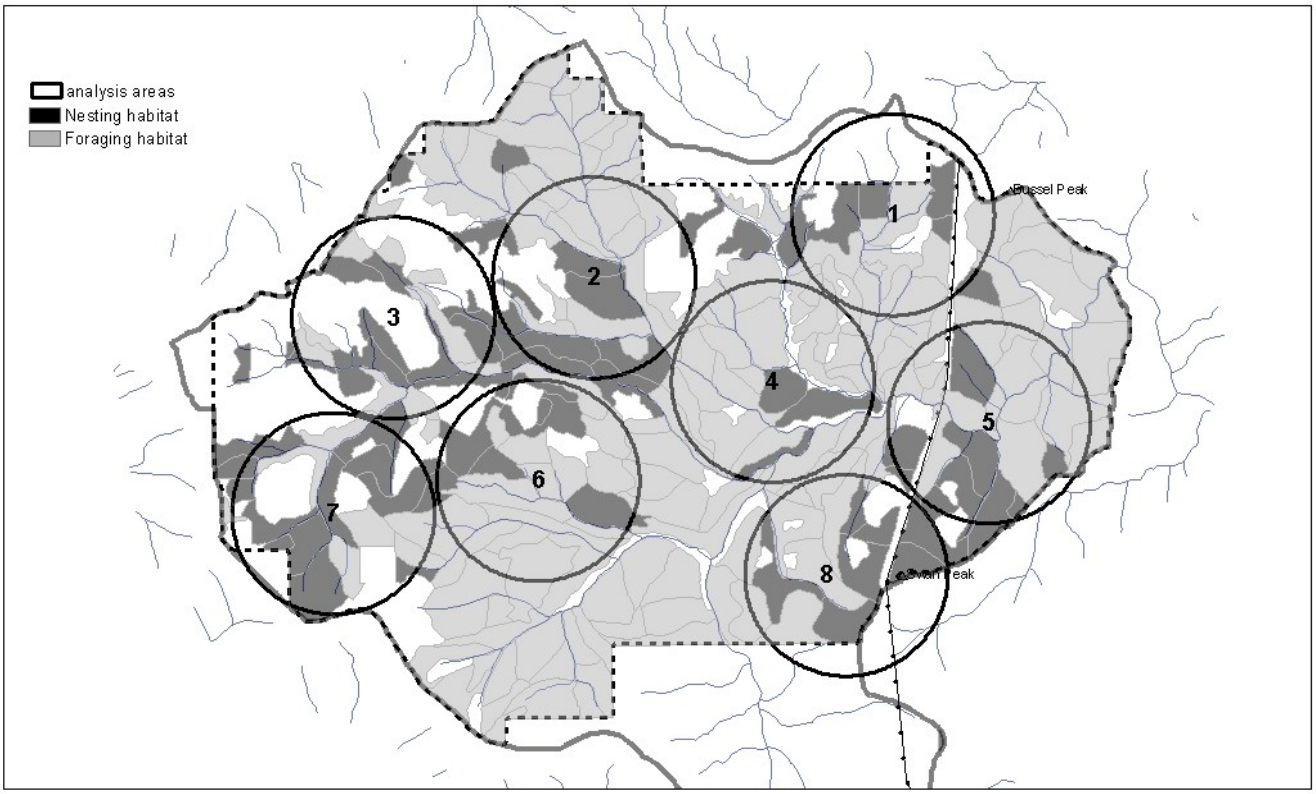

Figure 3 – Pileated Woodpecker Hypothetical Home Ranges

Affected Environment

No broadcast surveys for pileated woodpeckers were completed in the Bussel 484 project area. A pileated woodpecker was observed by wildlife personnel while conducting goshawk surveys in the south east portion of the project area (SWL-6). A pileated woodpecker was also observed near the north boundary of the project area (WL-44).

In addition to the sightings of pileated woodpeckers pileated foraging sign was located throughout the project area. Wildlife personnel conducting pileated woodpecker habitat surveys found 11 out of 30 (37%) stands surveyed showed sign of pileated woodpecker foraging (WL-2). Pileated foraging sign is unique in appearance and differs from other woodpeckers (Bull et al 1990). In a report outlining pileated woodpecker surveys conducted by the Coeur d'Alene Audubon Society on the IPNF in 2003, it was noted that pileated woodpecker responses correlated very tightly with observations of pileated foraging sign (Coeur d'Alene Audubon 2003).

The pileated woodpecker sighting in the project area coupled by foraging evidence in 37% of the stands that pileated habitat surveys were conducted shows pileated use of the project area.

Forest Plan standards are being met for old growth across the St. Joe Ranger District and the Forest (see the Old Growth Section, FEIS pages 151-154). There are 2,523 acres of allocated old growth in the wildlife analysis area. Approximately 23 percent (2,779 acres) of the Bussel 484 Wildlife Analysis Area is sawtimber/mature sawtimber – this includes allocated old growth. These stands (along with stands in the immature sawtimber size class) provide structure and attributes used by pileated woodpeckers (USDA 1990; Samson 2006a).

Environmental Consequences

Alternative A

Direct and Indirect Effects

There would be no effect on suitable pileated woodpecker nesting habitat or feeding habitat on NFS lands within delineated home ranges.

Alternatives B & C

Direct and Indirect Effects

Alternatives B and C would maintain suitable habitat to support pileated woodpeckers in 7 of the 8 home ranges (WL-11).

Proposed seed tree harvest treatment would render unsuitable ≈36 of the existing 109 acres of mature suitable nesting habitat in Home Range 4. This would result in insufficient suitable mature/old nesting habitat in Home Range 4.

In Home Range 3, approximately 44 acres of the existing 507 acres of foraging habitat would be impacted by partial harvest. Approximately 463 acres of foraging habitat would be maintained as untreated. Due to the design features (i.e. snag retention levels), prescriptions (i.e. thinning), pileated woodpecker use of areas with 10% forest cover (Samson 2006a), and information that indicates that cavity habitat and pileated woodpecker use can be maintained in partially treated stands (Quesnel and Steeger 2002), the 44 acres of partial harvest would retain their suitability as foraging habitat (albeit at a reduced level) and the suitability of the home range would be maintained.

In Home Range 8, approximately 261 acres of the existing 663 acres of foraging habitat would be impacted by partial harvest. Approximately 402 acres of foraging habitat would be maintained as untreated. Due to the design features (i.e. snag retention levels), prescriptions (i.e. thinning), pileated woodpecker use of areas with 10% forest cover (Samson 2006a), and information that indicates that cavity habitat and pileated woodpecker use can be maintained in partially treated stands (Quesnel and Steeger 2002), the 261 acres of partial harvest would retain their suitability as foraging habitat (albeit at a reduced level) and the suitability of the home range would be maintained.

Common to All Alternatives

Direct and Indirect Effects

No alternative would harvest existing old growth (see Old Growth, FEIS pages 151-154).

Cumulative Effects

Existing suitable habitat is a result of all past activities and disturbances. There would be no cumulative effects associated with this project or analysis area that would jeopardize populations of pileated woodpeckers. This is based on the potential effects from this project, the maintenance of existing suitable habitat and home ranges in the analysis area, the retention of existing immature sawtimber stands that would succeed to suitable habitat, compliance with the Forest Plan standards for old growth (to provide for viable populations of old-growth dependant and MIS), the abundance and distribution of nest site habitat and winter forage habitat across Region 1 and the IPNF (Samson 2006b), and the pileated woodpecker population trend is increasing (Appendix A).

Consequently, none of the alternatives would likely result in appreciable adverse habitat modification or a perceptible change in populations of pileated woodpeckers.

In the analysis area at least 40% of NFS lands would progress naturally from immature sawtimber forest to sawtimber/mature sawtimber size classes over time. This represents 70% of the existing immature sawtimber size class (Table 9). These areas would increase (over 10+ years) the potential suitable habitat and the number of home ranges.

It is expected that the majority of non-NFS land surrounding the project and analysis area would be actively managed; and therefore, no stands would remain in the sawtimber/mature sawtimber size class for any appreciable length of time before being treated. NFS lands would provide the vast majority of mature/old forest with non-NFS lands being in younger successional stages.

Based on the best available science summarized in the Management Indicator Species Considerations for the Idaho Panhandle National Forests (Appendix A), the pileated woodpecker population trend is increasing and their habitat appears to be abundant and well-distributed across the Region. The IPNF contains far more than enough large snag habitat than required by the Forest Plan and recommended by the scientific literature to support a minimum viable population of pileated woodpeckers. Pileated woodpeckers and their foraging sign are commonly seen and documented across the Forest. See Appendix A for more information on pileated woodpeckers.

Pileated Woodpecker Comparison of Alternatives

Table 9 displays the existing condition and potential effects on pileated woodpecker home ranges. For analysis purposes regeneration harvest would result in unsuitable nesting and foraging habitat and partial harvest would maintain the suitability of habitat at a reduced value (Samson 2006a).

Table 9 – Pileated Woodpecker Habitat by Hypothetical Home Range

Home Range	Existing		Alternatives B & C			
			Suitable		Un-impacted	
	Mature/Old Nesting	Foraging	Mature/Old Nesting	Foraging	Mature/Old Nesting	Foraging
1	172*	615	156*	599	139	511
2	307	792	298	762	298	762
3	308	507	308	507	308	463
4	109*	921	73	799	73	665
5	313	899	275	862	238	680
6	260	906	247	893	235	681
7	437	653	414	620	382	586
8	322	663	308	574	295	402

** Sufficient additional immature sawtimber acres available to provide sufficient suitable nesting habitat*

Species Commonly Hunted, Fished, or Trapped

The species listed under species commonly hunted, fished, or trapped represent important economic species that are of common public interest and are monitored by the Idaho Department of Fish and Game (IDFG). IDFG is responsible for setting the harvest regulations for the species in this category. By having populations that support harvest levels, viability is not a concern for these species. The data source for monitoring these species comes from IDFG (Forest Plan, p. IV-11).

Elk

The MIS section has been broken into two categories and elk have been moved into the MIS – species commonly hunted section. Effects analysis for elk is located on pages 264 through 266 of the FEIS. There are no changes to the anticipated effects for any alternative.

Moose

The MIS section has been broken into two categories and moose have been moved into the MIS – species commonly hunted section. There is still no need for further analysis on moose, see page 248 of the FEIS for rationale.

Other Wildlife Species

Species Commonly Hunted, Fished, or Trapped

Marten

The Marten section in the FEIS on pages 274 through 276 is replaced by the analysis of marten that follows.

Although marten were not specifically identified as MIS in the Forest Plan, they are identified as a species that is commonly hunted, fished, or trapped on the Forest. Marten are ranked G5 globally and S5 in Idaho, which is defined as "Secure: common, widespread, and abundant" (IDFG 2005). Current marten information from the Idaho Department of Fish and Game indicates the species is stable throughout north Idaho and there continues to be a marten trapping season (IDFG 2008). Based on their population status and their identification as a species commonly hunted, fished or trapped, viability is not a concern for marten.

The effects of the project on marten are discussed and the appropriate management of their habitat is addressed. Due to some overlap in their habitat associations with fisher (Ruggiero and others 1994), the effects to the portion of marten habitat that is similar can be ascertained by referring to the fisher analysis (e.g. lower elevation, late-successional, mesic). However, suitable marten habitat encompasses a broader spectrum of habitats than fisher based on the scientific literature (Ruggiero and others 1994, Samson 2006a), including stands with smaller diameter trees and a more open canopy. Additionally, marten have been shown to use higher elevation habitats and areas with more snow depth than are used by fisher (Ruggiero and others 1994, pers. comm. Albrecht 2011). Consequently, based on their broader habitat associations than fisher, marten habitat is more abundant (Bush and Lundberg 2008) and does not appear to be limiting across the landscape. Based on DNA and remote camera surveys conducted over the past seven years in North Idaho (e.g. over 400 verified marten detections), marten appear to be abundant and well-distributed across the Forest[1].

Affected Environment

In 2007, eight forest carnivore bait stations were placed in the Bussel 484 project area; no martens were detected at that time (Albrecht and Heusser 2009). In 2008, wildlife personnel on the St. Joe set 12 forest carnivore bait stations within the Bussel 484 project area. One marten was detected in the Bussel 484 project area (SWL-4).

[1] The marten data for this figure was provided by the Coeur d'Alene Tribe as a courtesy and are not on file with the USDA Forest Service.

For the Bussel 484 Project area, all stands that have an average d.b.h. of 9 inches or greater are considered potential habitat. Approximately 80% (9,803 acres) of the project area is potential marten habitat (Table 10).

Table 10 – Existing Marten Habitat in the Bussel 484 Project Area

Size/Structure	Existing Acres	Percent of the Landscape
Sawtimber/Mature Sawtimber	2,779	23%
Immature Sawtimber	7,024	57%
Total	9,803	80%

The landscape surrounding the analysis area to the southwest and west around to the northeast is primarily non-NFS land that does not or likely will not provide much mature or late successional forest within the foreseeable future.

Impacted riparian zones also affect existing marten habitat. See the section on riparian habitat (FEIS pages 253 – 254) for further discussion on effects on riparian habitat.

Trapping-vulnerability risk has been cited as one of the factors affecting forest carnivores in Idaho (Heinemeyer and Jones 1994). However, human impacts (e.g. roads) have not been significant variables in regional-scale models (Carroll and others 2001). Roads are correlated with trapping vulnerability and human disturbance. In areas having marten trapping seasons road densities greater than or equal to 1 mi/mi^2 road densities have a high risk to trapping vulnerability for fisher. It should be noted that marten are legally trapped in Idaho.

Roads and trails used by motorized vehicles have the greatest impact on wildlife (Wisdom and others 2004; Gaines and others 2003) and provide the most access for trapping. The existing motorized road/trail density in the Bussel 484 Wildlife Analysis Area is 3.4 mi/mi^2.

Environmental Consequences

Alternative A

Direct and Indirect Effects

This alternative would not alter existing marten habitat or change trapping vulnerability.

Alternatives B & C

Direct and Indirect Effects

Alternatives B and C would reduce marten habitat in the project area by approximately 399 acres (4%). However, 76% (9,404 acres) of the project area would still provide potential marten habitat. The alternatives could shift marten use patterns within the project area, but 76% of the project area would remain habitat and available for martens.

Alternatives B and C would reduce trapping vulnerability within the project area. Although road densities would be reduced in Alternatives B & C, they would remain at a level considered a high risk to trapping vulnerability.

Common to All Alternatives

Cumulative Effects

As stated above: Based on marten population status and their identification as a species commonly hunted, fished or trapped, viability is not a concern for marten. Marten habitat is abundant (Bush and

Lundberg 2008) and does not appear to be limiting across the landscape. Based on DNA and remote camera surveys conducted over the past seven years in North Idaho (e.g. over 400 verified marten detections, including the detection in the Bussel 484 project area), marten appear to be abundant and well-distributed across the Forest.

Existing suitable habitat is a result of all past activities and disturbances which include those discussed in the FEIS on pages 43-49. Succession of immature sawtimber stands would at some undetermined future date result in a minimum of 76% of the analysis area in mature/sawtimber. This would meet the criteria for a high-quality subdrainage. Road density would remain at a level considered a high risk to trapping vulnerability, but human-impacts (e.g. roads) have not been significant variables in regional-scale models (Carroll and others 2001). In all action alternatives road/trail densities would be reduced.

Marten - Comparison of Alternatives

Table 11 – Comparison of Alternatives on Marten Habitat

Size/Structure	Alternative A Acres (%)	Alternatives B & C Acres (%)
Sawtimber/Mature Sawtimber	2,779 (23%)	2,613 (21%)
Immature Sawtimber	7,024 (57%)	6,791 (55%)
Total	9,803 (80%)	9,404 (76%)

Table 12 – Comparison of Alternatives on Road Densities

	Alternative A	Alternative B	Alternative C
Road/Trail Density	3.4	2.2	2.1

Index

A

American peregrine falcon, 11, 15

B

bald eagle, 11, 15, 3, 4
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black-backed woodpecker, 11, 15, 22, 27
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forest landbird, 12
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Townsend's big-eared bat, 11, 15

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westslope cutthroat trout, 6, 7
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List of Agencies, Organizations, and People to Whom Copies of the SEIS are Sent

Native American Tribes:
Coeur d'Alene Tribe

Elected Officials:
Benewah County Commissioners
Shoshone County Commissioners

Agencies:
Bonneville Power Administration
Environmental Protection Agency Office of Federal Activities
Environmental Protection Agency Region 10
Idaho Dept of Environmental Quality Surface Water Section
Idaho Dept Fish and Game
Idaho Dept of Parks & Recreation
USDA Forest Service Ecosystem Management Coordination
USDA National Agricultural Library
USDA Office of Civil Rights
USDI Fish & Wildlife Service
USDI Office of Environmental Affairs

Organizations:
Alliance for the Wild Rockies
American Wildlands
Center for Biological Diversity
Defenders of Wildlife
Friends of the Clearwater
Idaho Conservation League
Kootenai Environmental Alliance
The Lands Council
Wildwest Institute

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Stimson Lumber

Appendix A

Management Indicator Species Considerations for the Idaho Panhandle National Forests

Introduction

The purpose of this white paper is to provide recommendations for analyzing management indicator species (MIS) on projects on the Idaho Panhandle National Forests in light of recent court decisions; Native Ecosystems Council et al v. Leslie Weldon (Case:06-35890) and Lands Council v. Jane Cottrell (Case:2:09-CV-164-EJL-REB).

Background

The National Forest Management Act (NFMA) requires the Idaho Panhandle National Forests to provide for and maintain diversity of plant and animal communities to meet overall multiple-use objectives stated in the Idaho Panhandle National Forests Forest Plan (USDA Forest Service 1987). We must also comply with the 2004 interpretive rule that requires the responsible official to "consider the best available science in implementing … the plan" (36 CFR 219.35(a)). Lastly, the IPNF Forest Plan currently provides that we maintain at least minimum viable populations of management indicator species distributed throughout the Forest (Forest Plan, p. II-28).

These requirements are not new; our NEPA analyses have always required a sound technical basis. Projects proposed and carried out must show consideration of "best available science", be consistent with the forest plan, and support maintaining diversity of plant and animal communities.

Management Indicator Species Overview

The 1982 planning rule provided direction for implementing the NFMA when the Idaho Panhandle National Forests Forest Plan was adopted in 1987. The 1982 rule directed forests to manage fish and wildlife habitat to maintain viable populations and directed forests to select MIS as a method to help ensure species viability (36 CFR 219.19).

MIS were defined as "plant and animal species, communities, or special habitats selected for emphasis in planning, and which are monitored during forest plan implementation in order to assess the effects of management activities on their populations and the populations of other species with similar habitat needs which they may represent" (FSM 2620.5). The role of MIS and the criteria to select MIS were described in 36 CFR 219.19 (a)(1) of the 1982 rule as follows:

In order to estimate the effects of each [Forest Plan] alternative on fish and wildlife populations, certain vertebrate and/or invertebrate species present in the area shall be identified and selected as management indicator species and the reasons for their selection will be stated. These species shall be selected because their population changes are believed to indicate the effects of management activities. In the selection of management indicator species, the following categories shall be represented where appropriate: Endangered and threatened plant and animal species identified on State and Federal lists for the planning area; species with special habitat needs that may be influenced significantly by planned management programs; species commonly hunted, fished, or trapped; non-game species of special interest; and additional plant or animal species selected because their population changes are believed to indicate the effects of management activities on other species of selected major biological communities or on water quality.

Forest Plan Direction for MIS

Wildlife Goals

The Forest Plan identified goals which are concise statements directed to the future, with no timeline or specific date attached. Specific goals related to MIS are as follows:

- Provide for a diversity of plant and animal communities (Forest Plan, p II-1-A(8)).
- Manage vertebrate wildlife habitat to maintain viable populations of all species (Forest Plan, p. II-1-A(9)).
- Manage big game habitat toward achieving the goals of the Idaho Department of Fish and Game (Forest Plan, p II-1-A(10)).

Wildlife Objectives

The Forest Plan identified objectives that are time specific, measurable, and respond to the goals stated above. Objectives are limited by budget. Specific objectives related to MIS are as follows:

To help provide for a diversity of plant and animal communities, habitats, and species, standards for old growth maintenance will be established. Approximately 10 percent of the Forest will be maintained in old growth…to provide for viable populations of old-growth dependent and management indicator species (Forest Plan, p. II-5(g)).

Habitat for vertebrate populations, other than TES, will be managed to maintain viable populations (greater than 40 percent of maximum potential). In order to maintain viable populations of all species, the habitat will be managed for selected indicator species. Habitat for species harvested (big game, small game, and furbearers), except elk, will be managed to meet goals outlined by the Regional Guides (Forest Plan, p. II-5(g)).

Wildlife Standards

The Forest Plan identified standards, when used with prescriptions for the management area (MA); these standards set the overall management direction for the IPNF. Specific standards related to MIS are as follows:

7. Other Wildlife

a. *Maintain at least minimum viable populations of management indicator species distributed throughout the Forest (see Appendix L for indicator species selection process Forest Plan, p. II-28).*

b. *Maintain habitat for cavity nesting species and foraging substrates by implementation of the IPNF Snag and Woody Down Timber Guidelines (Appendix X).*

Monitoring and Evaluation

Monitoring and evaluation comprise the management control system for the Forest Plan. They provide information on the progress and results of implementing the Forest Plan. Monitoring and evaluation entail comparing the end results being achieved to those projected in the Plan. When changes occur, they will be evaluated as to their significance (Forest Plan, p. IV-7).

Monitoring requirements for this Forest Plan are outlined in Table IV-2 (see Table 13 below). Other monitoring items are more applicable to broad areas or are Forest-wide in nature, and will be evaluated from such sources as the data base, Forest attainment reports, public involvement processes, and non-Forest Service sources. These items include: …F-1 (wildlife)… (Forest Plan, p. IV-8).

The Idaho Department of Fish and Game (IDFG) is identified in the Forest Plan as the data source for monitoring population trends of MIS on the Forest. However, IDFG focuses their monitoring efforts mostly on commonly hunted, fished or trapped species and information from IDFG regarding other MIS is limited. Consequently, population trend information for MIS other than those commonly hunted, fished or trapped consists of the best

available science drawn from a variety of sources such as Forest Service inventorying and monitoring information, scientific papers, research, the U.S. Fish and Wildlife Service, state natural heritage programs, NatureServe, the U.S. Geological Survey, Avian Science Center and others.

Table 13. – Copy of Table IV-2 Monitoring Requirements from IPNF Forest Plan p. IV-11 for Wildlife item F-1 only

Standards, Practices, Activities, Outputs or Effects to be Monitored	Data source	Estimated Precision	Expected Reliability	Frequency of Measurement	Reporting period	Threshold to initiate further action
WILDLIFE						
Population trends of indicator species	State Fish and Game	Moderate	Moderate	Annually	5 years	Downward population trends

Forest Plan MIS Selection

Important characteristics used for selecting MIS in the Idaho Panhandle National Forests Forest Plan were: they were considered to be sensitive to management activities, they were capable of being effectively monitored, habitat requirements could be quantitatively assessed on the gross scale of Forest planning, and they were larger, more wide-ranging species rather than smaller animals. The assumption was that component elements of the habitat of large animals would produce viable populations of smaller animals (Forest Plan, p. L-2).

Under the 1987 Idaho Panhandle National Forests Forest Plan, Appendix L identified a total of 13 potential MIS that had documented presence on the IPNF (Forest Plan p. L-3). Of these 13 species, 11 were actually selected as IPNF MIS (Forest Plan, p. L-4 through L-6). Table 14 lists potential indicator species with documented presence on the IPNF and shows with a check mark those species that were selected as MIS in the 1987 Forest Plan.

Table 14. – Selecting Indicator Species on the IPNF – Documented Presence on IPNF

Threatened or endangered species on federal or state lists	Species commonly hunted, fished, or trapped which have special habitat needs that are affected by planned management activities	Other species whose population changes are believed to indicate effects of management activities on a major biological group or on water quality
Bald Eagle Grizzly Bear Woodland caribou Gray Wolf	Elk White-tailed deer Moose Marten Cutthroat trout Rainbow trout Bull trout	Pileated woodpecker Goshawk

✓ Indicates that the species was selected by the IPNF and reason for selection is identified in the Forest Plan on pages L-4 through L-6

Those species listed under threatened or endangered are protected under the Endangered Species Act (ESA) and by definition have viability concerns. The Idaho Panhandle National Forests is committed to ensuring their protection and recovery through compliance with ESA and the Forest Plan (Forest Plan, pp.II-27-28, III-7-16, IV-8-11, V-3, Appendix N, U, and W).

Bald Eagle population trends increased over time, recovery goals were met and this species was delisted in 2008, and is now designated as a regional sensitive species. Grizzly bear and woodland caribou continue to be federally listed. Gray wolf was not selected as a MIS; however, this species has been included as an MIS in past Forest Plan monitoring reports because of its federally listed status. The population trend of this species in North Idaho is

increasing. Bull trout, a species that was originally chosen because it was commonly fished for, was listed as threatened under ESA in 1998.

The species listed under species commonly hunted, fished, or trapped represent important economic species that are of common public interest and are monitored by the Idaho Department of Fish and Game. IDFG is responsible for setting the harvest regulations for the species in this category. By having populations that support harvest levels, viability is not a concern for these species. The data source for monitoring these species comes from IDFG (Forest Plan, p. IV-11).

Elk, white-tailed deer, and moose continue to be commonly hunted in North Idaho. Population trends for elk and white-tailed deer are stable to increasing (IDFG 2008a, IDFG 2008b); while the population trend for moose is increasing (IDFG 2008c). Federal listing of westslope cutthroat trout was determined to be "not warranted" in 2000 and 2003. This species continues to be commonly fished for in North Idaho. Cutthroat trout population trends on the IPNF overall tend to be stable to increasing (USDA Forest Service 2010a). The vast majority of rainbow trout found on the IPNF are non-natives. There is no longer legal harvest of bull trout; however, overall population trends on the IPNF are stable to increasing, except in the Priest River drainage (USDA Forest Service 2010a).

Marten are listed under the heading of species commonly hunted, fished, or trapped yet they were not selected as an Idaho Panhandle National Forests indicator species (see Table 14). Although marten were not specifically identified as an MIS in the Forest Plan, the IPNF has treated them as one in the past. The IPNF will no longer identify marten as MIS, but will continue to analyze the effects of projects on marten as a species that is commonly hunted, fished, or trapped.

Marten are ranked G5 globally and S5 in Idaho, which is defined as "Secure: common, widespread, and abundant" (IDFG 2005). Current marten information from Idaho Fish and Game indicates the species to be stable throughout North Idaho and there continues to be a trapping season on them (IDFG 2008d).

Species included under other species whose population changes are believed to indicate effects of management activities on a major biological group or on water quality are listed because it was thought that their populations would be affected by management activities at the forest level, not at the project level. These species are pileated woodpecker and northern goshawk. While these species met some of the characteristics for selecting MIS, they pose difficulty in surveying and monitoring on a meaningful basis and may not respond to direct habitat changes locally but rather are influenced by many other factors such as predation, weather and competition.

The reasons for selection of pileated woodpecker and northern goshawk stated in Appendix L of the 1987 Forest Plan are as follows:

G. Pileated woodpecker

1. Pileated woodpeckers are the largest primary excavator in the IPNF. They are dependent on large snags for nesting sites. Although past fires have left a temporary abundance of snags on the IPNF, standard logging practice is to cut these snags. As more of the forest comes under timber management, available and suitable nest trees may be severely reduced.
2. Pileated woodpeckers are also generally regarded as old-growth indicators because of their dependence on large old snags for nesting and downed logs for feeding. Snags and down rotten logs are characteristic elements of decadent stands.
3. A wide variety of small mammals and birds are dependent on holes excavated by pileated woodpeckers for denning or nesting.

H. Goshawk

4. Goshawks are proposed as indicators of old-growth habitats. Goshawks prefer multi-layered mature and old-growth stands of about 30 acres on flattish, northern aspects for nesting.
5. Despite their preference for nesting in old-growth stands, goshawks feed largely on seral species. Thus, they are more diverse and interspersion dependent than pileated woodpeckers.

It is important to note that the IPNF no longer conducts timber harvest or any other management that removes allocated old growth stands and has not done so for many years (USDA Forest Service 2010a). However, old growth distribution is not static because forests are living, dying and changing as part of natural communities. Disturbances such as fire, insects, disease and weather events may reduce the amount of old growth in some areas while other areas will grow and age into old growth. The IPNF contains almost 700,000 acres of mature forest (canopy dominated by trees over 100 years old), substantial amounts of which have the potential to develop into old growth in the next few decades (USDA Forest Service 2010a).

Equally important to note is that in contrast to what was stated in the 1987 Forest Plan, snag removal is no longer a standard logging practice. In fact, design features based on Regional guidance, such as the Northern Region Snag Management Protocol (USDA Forest Service 2000) and the Estimates of Snag Densities for Northern Idaho Forests (Bollenbacher et al. 2009) have greatly improved the retention of quality snags and live trees to serve as future snags. Specifications contained in timber sale contracts also typically require the retention of all or most snags, particularly large diameter ones, except those needing to be removed for safety purposes due to Occupational Health and Safety Administration (OSHA) guidelines. Additionally, any larger snags felled per OSHA guidelines must be left on site after they are felled, which provides large downed logs needed for pileated woodpecker foraging and habitat for northern goshawk prey species.

The remainder of this paper centers on the northern goshawk and pileated woodpecker.

Management Indicator Species Step Down Process

General Considerations

The Ninth Circuit Court has upheld the use of habitat analysis to determine the effects on species from management activities (Lands Council v. McNair). Wildlife surveys conducted within project areas are designed to document species presence, rather than abundance. MIS status is a Forest-level evaluation that requires reconciling disparities in the geographic scale between the management actions and the scale of ecological and species-specific responses. For instance, population viability and trend information is not scientifically feasible, or even appropriate, at smaller scales such as a project area, particularly for species with relatively large home ranges such as the northern goshawk and pileated woodpecker (Beissinger 2002, Samson 2006a). Instead, the IPNF uses habitat as a proxy for population data of MIS, and MIS habitat suitability assessments are conducted within project areas.

In addition, species presence surveys do not determine absence of a species. Many variables impact the ability to detect a species even if they are present such as secretiveness, large home ranges, seasonal detectability, and temporal movements of the species (Bull et al. 1990, Woodbridge and Harris 2006). Therefore, again, a more meaningful and credible approach in conducting an analysis is to assess habitat suitability based on biophysical attributes, using species survey information to help validate suitability of habitats. In many cases, surveys can also identify key habitats (e.g., breeding or nesting sites) that can be protected through project design features.

An important concept in discussing habitat suitability for some species is the distinction between capable habitat and suitable habitat. Capable habitat refers to the inherent potential of a site to produce the necessary biotic and abiotic components to support a given species. Suitable habitat refers to habitat that is currently providing the necessary

components to support a species. Therefore, habitat that is unsuitable is capable habitat that has the potential to develop into a suitable condition, but currently does not meet the habitat requirements for a species. Habitat that is not capable has no potential to develop into a suitable condition.

Complex relationships exist among the variables that define the use of suitable habitat by a wildlife species (Pulliam 2000). Among other factors, the size and configuration of habitat, dispersal ability of individuals and interspecific competition can play into the ability of a species to occupy suitable habitat. Consequently, it would not be expected that every acre of suitable habitat will be occupied by a particular wildlife species at any given point in time. Populations of wildlife species that are abundant and well-distributed across the landscape do not occupy every acre of suitable habitat across a variety of spatial scales. For species that are less common, the likelihood of suitable, but unoccupied, habitat is high, regardless of population status.

> *"Clearly, competition, dispersal, niche size and the distribution of environmental conditions in space and time all play some role in determining species distributions in relationship to the distribution of suitable habitat" (Pulliam 2000).*

However, this does not diminish the importance of recognizing an area as suitable habitat and managing it accordingly. Whether or not the potentially suitable habitat is currently occupied by the species in question, suitable habitat may be occupied by that species in the future so it is important to manage, particularly if it is a habitat that is limited across the landscape.

The Council on Environmental Quality (40 CFR 1502.2) directs that impacts be discussed in proportion to their significance. Some wildlife species require a detailed analysis to determine effects of an action on them. Other wildlife species may not be impacted or impacted at a level that does not increase risk to the species. Some species may be adequately protected by altering the design of the project. 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 within the project area, 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 on the species or habitat being analyzed.

National Overview

The northern goshawk and pileated woodpecker are protected under the Migratory Bird Treaty Act. Executive Order 13186 of 2001 clarified the responsibilities of Federal agencies regarding migratory bird conservation, and these responsibilities include inventory and monitoring. In December 2008, the Forest Service entered into a Memorandum of Understanding (MOU) with the U.S. Fish and Wildlife Service on the Migratory Bird Treaty Act that further clarified the Forest Service's commitment to bird conservation during forest and project-level planning (USDA Forest Service and USDI Fish and Wildlife Service 2008).

Within the National Forest System, conservation of migratory birds focuses on providing a diversity of habitat conditions at multiple spatial scales and ensuring that bird conservation is addressed when planning for other land management activities. National forest managers design and collaborate on projects that provide for bird conservation in accordance with numerous laws, agreements and collaboratively-developed comprehensive planning documents. As part of the MOU, the Forest Service agreed to consider the most up-to-date Fish and Wildlife Service list of Birds of Conservation Concern and to evaluate the effects of agency actions on migratory birds within the NEPA process, focusing first on these species of concern along with their priority habitats and key threats. The northern goshawk and pileated woodpecker are not on either the U.S. Fish and Wildlife Service's current list of Birds of Conservation Concern or Birds of Management Concern for the Northern Rockies, which includes northern Idaho (USDI Fish and Wildlife Service 2008, USDI Fish and Wildlife Service 2009).

In 2004, Partners in Flight published the North American Landbird Conservation Plan to identify birds of concern along with recommendations on how to protect these species and their habitat. As part of the Plan, they developed a Species of Continental Importance in the Intermountain West Avifaunal Biome list, which includes all of Idaho. The northern goshawk and pileated woodpecker were not included on the list of over 30 bird species warranting special concerns within this region (Partners in Flight 2004).

Northern Region Overview

In 1990, the Avian Science Center (ASC) designed a monitoring program to help biologists and managers better understand the habitat relationships and population trends of landbirds breeding in the Northern Region, including northern goshawks and pileated woodpeckers. ASC coordinated efforts to survey birds at permanently marked points on an every-other-year basis. Preliminary ASC analyses suggest that most landbird populations have remained fairly stable during the 12-year period from 1994 to 2006 (Avian Science Center 2009).

In 2006, the Northern Region of the Forest Service released a conservation assessment, which included northern goshawk and pileated woodpecker, to provide a synthesis on the best available science regarding habitat and populations and to analyze the availability of habitat for these species across the region and on the individual Forests (Samson 2006a; updated estimates in Bush and Lundberg 2008). The conservation assessment considered peer-reviewed literature, non-peer-reviewed publications (particularly master's theses and PhD dissertations), research reports and Forest Service data. Peer-reviewed literature published in professional journals was emphasized where possible since they are the accepted standard. Additionally, literature published since 2000 was emphasized since these more recent publications review previously published literature and provide for the best available science.

The conservation assessment is based on a principle-based approach to population viability analysis (PVA). This method uses point observation data and vegetation inventory information based on the Forest Inventory and Analysis (FIA) data to build wildlife habitat relationship models to analyze short-term viability (less than 100 years). It also discusses the use of dispersal distance to assess the distribution of habitat and long-term viability based on the principles of Representation, Redundancy and Resiliency.

The FIA program provides a congressionally mandated, statistically-based, continuous inventory of forest resources. The FIA program is administered through the Research branch of the Forest Service, making it administrated independently of the National Forest System. FIA inventory design is based on the standardized national grid of inventory plots that covers all forested areas of the United States. Both sample plot location and data collection standards are strictly controlled by FIA protocols. The sample design and data collection methods are scientifically designed, publicly disclosed and repeatable. There are also stringent quality control standards and procedures, carried out by FIA personnel. All of this is designed to assure that all measurements are accurate and that there is not bias in sample design, plot location, trees selected for measurement or the measurements themselves. Using FIA data allows the Forest Service to base habitat condition assessments on an unbiased, statistically sound, independently designed and implemented representative dataset.

FIA data provides statistically reliable estimates at the Regional and Forest levels. Estimates of habitat from FIA data provide broad-level cumulative effects information. This information is useful in setting the context for the possible effects of a project. However, finer-level vegetation analysis, such as can be done with stand exam data, is necessary to quantify and map northern goshawk and pileated woodpecker habitat at the project level using parameters similar to those of the FIA model (Samson 2006a). See Samson (2006a) for a detailed description of the methods used to determine the amount of habitat available for each species in question.

The Forest Service Northern Region developed these documents to satisfy the requirements of NFMA and Forest Service regulations. The Forest Service's focus for meeting the requirement of NFMA and its implementing regulation is to assess habitat and provide species diversity (Brewer et al. 2009).

Although the Forest Plan requires maintaining minimum viable populations of MIS at the Forest level, larger scale inventory and monitoring efforts for MIS population trends and habitat suitability at the regional or ecosystem level provide a vital backdrop on which to assess these species. Efforts, such as those described above, undertaken by the Forest Service, other governmental agencies (Federal and State) and other organizations (e.g. Partners in Flight) provide the best possible accumulation of information for determining the population trends for a species by providing a broad context. They are also better able to account for broader scale ecosystem functions such as disturbance processes (e.g. insect and disease outbreaks) and climate change.

Forest Overview

The IPNF considers Samson (2006a, 2006b, and updated habitat estimates in Bush and Lundberg 2008) to be the best available science addressing viability for northern goshawk and pileated woodpecker for the Northern Region. These references are a synthesis and evaluation of available research and information applied to specific management questions relevant to this and other agency decisions and management issues. Wildlife analyses on the Forest appropriately evaluate and consider works like these, along with more recent research and information (much of it peer reviewed), in analyzing and disclosing potential effects of the proposed actions on these species. The analyses use a variety of reliable sources of information including peer-reviewed literature, published reports, monitoring of the Forest Plan and specific projects, General Technical Reports from the Forest Service research branch, and conservation strategies that are based on peer reviewed science and bridge research with resource management.

The amount of mature/old growth habitat on the IPNF is within the historic range of variability, albeit on the low end of the range (USDA Forest Service 2011), and may represent reduced pileated woodpecker nesting habitat compared to historic conditions. More importantly from a goshawk habitat standpoint, the within-stand species composition has changed even more substantially from the historic condition, replacing mature stands dominated by early seral species with dense stands of mid/late seral species and congested understories that diminish both nesting and foraging habitat for goshawks. Additionally, white pine-dominated stands likely made considerable contributions to goshawk habitat historically (due to the presence of large-diameter individual trees, continuous overstory canopy and relatively open understories), but these stands are all but eliminated from today's landscape due to white pine blister rust (Harvey et al. 2008).

Many of the stands now dominated by mid/late successional shade-tolerant species are unlikely to mature into old growth if left alone due to their susceptibility to insects and disease, and other stands that may still contain remnant large early seral fire-adapted individuals have accumulated fuel loads to the point that merely discontinuing fire suppression in these stands is more likely to result in a stand-replacing fire than to recreate the more open stand conditions dominated by large individuals that existed historically.

Consequently, it can generally be assumed that northern goshawk and pileated woodpecker nesting habitat was more prevalent on the IPNF prior to settlement than it is now due to the clearing of land for agriculture, large scale wildfires in 1910, logging, fire suppression, and the introduction of white pine blister rust. Availability of mature and old growth forests probably reached its lowest level at some point in the years after the late 1970s, when logging reached its peak. Since the late 1980s, the decline in timber harvest has been precipitous. Over the last ten years, the IPNF has harvested less than two percent of the forested acres on the Forest (USDA Forest Service 2010b). In the early 1990s, timber harvest of old growth effectively ended on the IPNF and the blister rust epidemic had largely run its course. The preponderance of forested acres has gradually been maturing since that time.

Based on current FIA data, the estimated percent of old growth on the forested lands of the IPNF is 11.8 percent (USDA Forest Service 2010a). Additionally, based on the IPNF's field examination and assessment at the stand-level to determine how well they meet the old growth definitions in the Forest Plan and Green et al. (2008), the acres of mapped stands allocated and retained for old growth on the IPNF is 12.4 percent (USDA Forest Service 2010a).

The stand-level old growth allocation allows the IPNF to distribute old growth across the Forest and landscapes in ways that make ecological sense at the landscape scale.

Northern Goshawk

Background

In 1991 (Babbit et al. 1991, Silver et al. 1991) and in 1997 (USDI Fish and Wildlife Service 1998), the northern goshawk was petitioned to be listed as threatened or endangered in the western United States. On June 29, 1998 (63 FR 35183), in response to the 1997 petition, the U.S. Fish and Wildlife Service (USFWS) concluded based on the best available science that the listing of the northern goshawk was not warranted because:

- There was no evidence of a declining population trend for goshawks in the western United Sates.
- There was no evidence that goshawk habitat is limiting the population, or that significant curtailment of the species' habitat or range is occurring.
- The goshawk continues to be well-distributed throughout its historical range.
- There are no significant areas of extirpation.
- While the goshawk uses stands of mature and older forests it is not dependent on old-growth, and uses a variety of forest habitats in meeting its life history requirements.

In 2009, Brewer et al. released a report for the Forest Service Northern Region that summarized the best available scientific information about the ecological status of northern goshawks: the estimated amounts and distribution of goshawk habitat in Region One (Samson 2006a; estimates updated in Bush and Lundberg 2008); the results of the 2005 R1 grid-based inventory of the species (Kowalski 2006); and a consistent methodology for conducting habitat analysis. The methods used to classify goshawk habitat at multiple-spatial levels follows the architecture supported by the R1 Multi-Level Classification, Mapping, Inventory and Analysis System (Berglund et al. 2009). This system provides a consistent methodology to classify vegetation dominance type, tree size class and tree canopy cover for R1-VMap and data inventory information residing in FSVeg. See Brewer et al. (2009) for a detailed description of the methods used.

Species Description and Habitat Associations

The northern goshawk is a forest habitat generalist that uses a wide variety of forest age classes, structural conditions and successional stages, inhabiting mixed-conifer forests in much of the northern hemisphere (Reynolds et al. 1992). Nesting habitat appears to be the most critical and limiting factor for goshawks. Throughout North America, goshawk nest sites have typically been associated with the later stages of succession (mature and old growth forests) having relatively closed canopies (50 to 90 percent) with open understories located on the lower one-third or bottom of the hill slope and in most cases in areas with less than a 40 percent slope (Hayward and Escano 1989, Warren 1990, Squires and Reynolds 1997, Graham et al. 1999). They nest in a variety of forest types throughout their range and typically nest in one of the largest trees within the nest stand (Squires and Reynolds 1997, USDI Fish and Wildlife Service 1998, Samson 2006a, Squires and Kennedy 2006). The nest area vegetative and structural composition represent a much narrower range of characteristics than the surrounding post-fledgling area (PFA) and foraging areas (Brewer et al. 2009).

In contrast to what is suggested in the Forest Plan, no evidence exists that goshawks depend on large, unbroken tracts of mature forest or old growth or that they specifically select for old growth forests (Whitford 1991, USDI Fish and Wildlife Service 1998, McGrath 2003). However, although goshawks are not considered to be old growth dependent, old growth can be important for goshawks, not only for prey species habitat, but also for the large trees that provide substrate for their substantial nest structures.

The nest area size for goshawks documented in scientific literature ranges from one acre to 148 acres based on local conditions and can include multiple alternate nests (Reynolds et al. 1992, Squires and Reynolds 1997, Patla 1997,

Clough 2000, McGrath et al. 2003). Thirty acres was recommended as the minimum nest stand sizes by Reynolds et al. (1992) and was the guideline adhered to by the IPNF for a over a decade. However, based on more recent research conducted in Montana and the subsequent recommendations in Brewer et al., nest stands on the IPNF are currently delineated at a minimum of 40 acres in size (Clough 2000, Brewer et al. 2009).

Goshawk territories contain a post-fledgling area surrounding the nest site that is used by the family group from the time the young fledge until they are no longer dependent on the adults for food (Reynolds et al. 1992, Kennedy et al. 1994, Kennedy and Ward 2003). The PFA and the home range (which includes the nest area, post-fledgling area and foraging area) both contain a more heterogeneous mix of forest age and structural components than the nest area itself (Reynolds et al. 1992). The size of the PFA ranges in the literature from 198 acres to 494 acres. The size, shape, habitat composition and functional importance of the PFA may vary with local conditions, such as disturbance history, prey availability and risk of predation (Squires and Kennedy 2006).

Research indicates the goshawk home range or foraging area varies depending on prey abundance/availability, habitat conditions and other factors, but has been shown to range from approximately 1,400 acres to 8,600 acres (Reynolds et al. 1992, Kennedy 2003, Brewer et al. 2009). These areas typically have one to five nest sites within them. Based on Brewer et al. (2009), a foraging area size of 5,000 to 6,000 acres is used on the IPNF to delineate potential goshawk territories and to provide an adequate cumulative effects area for project-level analysis.

Foraging habitat entails a much wider range of forest age classes and structures that provide a relatively open forest environment for unimpeded movement or flight through the understory. One factor influencing goshawk habitat is the amount of understory vegetation. Because northern goshawks require a combination of adequate overstory to provide prey species and adequate clearance for flight maneuverability, some stands that historically were suitable for foraging are no longer suitable due to an increased density of understory vegetation largely as a result of fire suppression.

Threats

The primary threats to northern goshawk that may result from forest management activities on public land include a reduction in the amount of mature forests and their associated structures (e.g., large-diameter snags and logs) along with the transition of older forests from being dominated by shade-intolerant tree species to being dominated by a dense structure of shade-tolerant tree species, primarily due to fire exclusion (Wisdom et al. 2000). This increase in shade-tolerant species has increased the forest's susceptibility to stand-replacing fires, and has adversely affected habitat suitability by 1) obstructing flight corridors used by goshawks to obtain prey, and 2) reducing herbaceous understory that supports prey species (Wisdom et al. 2000).

Fire exclusion, insects, and diseases have changed the species composition and structure of many stands, reducing their suitability for goshawk habitat. Some capable habitat on the Forest consists of younger, more immature stands that do not contain larger diameter trees used by goshawks for nesting or they are more mature stands, but contain a high density of smaller stems in the understory. As the secondary canopy layer becomes more congested, these stands lose their effectiveness as goshawk habitat.

The primary threats to the northern goshawk that could occur as a result of activities on private land, thus out of the control of the Forest Service, include the conversion of forested habitats to non-forested habitat (e.g. regeneration harvest on private timber industry land, conversion of forest habitat to residential or agricultural development) and human disturbance in close proximity to goshawk nest sites.

Difficulties in Monitoring

Goshawk detectability is highly variable within a breeding season, and nest sites can be difficult to locate. During certain times of the nesting season, goshawks actively defend the nest stand. Additionally, adults and nestlings are vocal in and around nest sites during the later stages of the nesting season and at times will respond to auditory surveys in close proximity to the nest stand. Consequently, if a goshawk survey occurs during this time frame and

in close proximity to the nest, the chances of detecting this species are good. Outside of the breeding season, goshawks are largely silent (Woodbridge and Hargis 2006).

However, when monitoring a species with a large home range of potentially more than 6,000 acres, such as the goshawk, locating the nest stand within that territory can be very difficult. Adding to the difficulty of locating an active nest is the goshawk's propensity of maintaining multiple nest sites within their home range and to use different nests from year to year, as well as to create new ones. Although known for aggressively defending their nests, breeding goshawks are typically secretive and nest sites are often difficult to locate (Woodbridge and Hargis 2006). Visual and auditory detectability varies greatly during the reproductive cycle. During incubation and the early nestling stage, adult goshawks tend to remain quiet and do not typically respond to auditory surveys (Woodbridge and Hargis 2006). During these times, detecting goshawks can be extremely difficult, even if you are standing at the base of tree with an occupied nest. Additionally, if a nest failure occurs during the incubation and early nestling stage, surveys initiated after goshawks become more vocal would likely not be able to determine that the stand or a particular nest site had been active.

Topography (e.g. slope and elevation) and habitat structure (e.g. horizontal cover and vegetation density) can also substantially impact the ability of surveyors to hear auditory responses, track the movements of individual goshawks and ultimately locate and verify nest sites. For instance, habitats on gentle slopes with a more open canopy and less dense understory provide favorable conditions for locating goshawks and their nests. However, in North Idaho, the steep slopes and denser stands characterized by closed canopies increases the difficulty in locating and monitoring northern goshawks and their nest sites.

Another factor affecting the timing of detection is the correlation of the nesting season with seasonal and climatic weather patterns. Late winter and spring weather that is cool and moist, as is typical in North Idaho, hampers early season goshawk surveys that are used to determine if territories are occupied and snow conditions limit access to many areas making completion of transects difficult. Additionally, a late winter can delay the nesting time frame in some areas on the Forest, but may not in all areas, or an early spring can lead to earlier nesting. These differences in the start of nesting season in turn alter the timing on when goshawks are likely to respond to auditory surveys and be detected. These fluctuations make it more difficult to locate and survey a nest stand within the window of time when responses would be expected and goshawk detection is more likely to occur. In the Northern Goshawk Inventory and Monitoring Technical Guide, Woodbridge and Hargis (2006) surmise that when compared to surveys for songbirds, goshawk auditory responses, which rely on eliciting defensive responses, vary greatly and depend highly on the reproductive chronology and status of the goshawk pair.

As a result, while it can be difficult to monitor known, recently occupied goshawk territories from year to year, it is substantially more difficult to locate and confirm goshawk presence in areas with no previously documented territories. This is particularly true since based on the factors discussed above; systematic auditory surveys within suitable nesting habitat may not always be effective in locating active nests. Consequently, conducting goshawk surveys with sufficient intensity on thousands of hectares of suitable goshawk habitat Forestwide for a period of time adequate to establish a statistically sound population trend would be extremely difficult and likely infeasible.

Existing Condition

According to NatureServe (2009) the northern goshawk has a global conservation status rank of G5. This indicates the species is common, widespread, abundant, and therefore secure across its range. Although the vast majority of the IPNF is within Idaho, it also includes some portions of Washington and Montana. All three states list the status of the northern goshawk as S3, which indicates there are some factors posing moderate risks to the species or its habitat, such as insect and disease outbreaks in Montana. The northern goshawk is not a "species of greatest conservation need" in either Idaho or Montana (IDFG 2005, MNHP 2010). In 2011, the State of Idaho will be reviewing the conservation status of this species and the state rank will be adjusted, if necessary, to reflect information that has become available since the last revision in 2005 (Dixon, pers. comm. 2011). Concerns in

Washington appear to stem from declines in goshawk populations in the western portions of the state (WDFW 2005).

According to the Partners in Flight Population Estimates Database, there are approximately 62,000 northern goshawks in the Northern Rockies Bird Conservation Region (BCR), which includes North Idaho. Within just the North Idaho portion of the BCR the population is estimated to be approximately 4,000 northern goshawks (Partners in Flight 2007). The North Idaho estimate has a lower data quality rating than the data for the Northern Rockies and therefore a lower accuracy due to a more limited amount of data. See Guide to the PIF Population Estimates Database: North American Landbird Conservation Plan 2004 for a detailed description of the data used and limitations of these population estimates (Blancher et al. 2007).

Northern Region

Based on methodology discussed briefly in the Northern Region Overview section above and described by Samson (2006a) and updated in Bush and Lundberg (2008) using FIA data, the North Rocky Mountain Ecological Province (NRMEP); comprised of the Idaho Panhandle, Clearwater, Flathead, Kootenai and Lolo National Forests, contains approximately 126,349 acres of goshawk nesting habitat, approximately 400,104 acres of habitat for utilization as post-fledgling habitat and approximately 3,779,928 acres of foraging habitat.

Samson (2006b) concluded, based on the synthesis of the best available science, that to maintain a minimum viable population of the northern goshawk across Region One, there would need to be a minimum of 30,147 acres of PFA habitat, based on a net effective population size of 110 individuals (55 pairs) using an approximately 545 acre PFA per pair. Bush and Lundberg's updated FIA data results in 2008 for northern goshawk habitat indicates that the NRMEP alone provides more than 13 times more acres of habitat than needed for the entire Region to maintain a minimum viable population of the northern goshawk (Samson 2006b, Bush and Lundberg 2008).

Samson (2006b) also determined using a dispersal distance method developed for birds (Bowman 2003) that suitable habitat for the northern goshawk was within the species-specific dispersal distance, indicating that well-distributed habitat is not an issue in the Northern Region.

In 2005, the Northern Region conducted goshawk surveys throughout the region based on the Northern Goshawk Inventory and Monitoring Technical Guide (Woodbridge and Hargis 2006). The primary purpose of the surveys was to estimate the frequency of goshawk presence within grids that approximated a territory size and to better define the geographic distribution of goshawk across the Northern Region. Based on the results of the survey and goshawk nest information provided by the Forests, the frequency of goshawk presence in the accessible portions of the Northern Region suggests they are relatively common and well distributed across the region (Kowalski 2006).

Samson (2006a) concluded the following with regard to the short-term viability of the northern goshawk in the Northern Region of the Forest Service based on his review of the pertinent literature and synthesis of the best available science, as well as his habitat assessments:

- No scientific evidence exists that the northern goshawk is decreasing in numbers.
- Increases in the extent and connectivity of forested habitat have occurred since European settlement.
- Well-distributed and abundant northern goshawk habitat exists on today's landscape.
- Level of timber harvest is insignificant in the Northern Region (in 2009, 4,854 ha of 9,045,255 ha or 0.05% of the forested landscape) and on the IPNF (551 ha of 999,733 forested ha or 0.06% of the forested landscape) (USDA Forest Service 2010c). Over the last ten years, the Northern Region harvested 76,649 ha or 0.85% of the forested landscape and the IPNF harvested 15,367 ha or 1.54% of the forested landscape (USDA Forest Service 2010b). These figures include all types of harvest and does not indicate that all harvested hectares resulted in habitat loss or degradation for northern goshawks.

Until 2007, the northern goshawk was listed as a Sensitive Species in the Northern Region of the Forest Service. Forest Service Manual states that Sensitive Species are those for which there is a significant current or predicted downward trend in population numbers/density and a similar downward trend in habitat capability that would reduce distribution of the species. Regional data collection and analyses demonstrates that neither condition exists for the northern goshawk; therefore in 2007, the species no longer met the definition for "sensitive" and was removed from the list (USDA Forest Service 2007).

Forest

Based on the analysis performed by the Northern Region, the IPNF contains approximately 32,967 acres of goshawk nesting habitat, approximately 148,354 acres of habitat for utilization as post-fledgling habitat and approximately 918,379 acres of foraging habitat (Samson 2006a, Bush and Lundberg 2008).

Based on Samson habitat thresholds for maintaining a minimum viable population across the Region and the updated FIA information provided by Bush and Lundberg (2008), the IPNF contains just under five times more PFA habitat on this Forest alone than is needed to provide viability at the Region level.

Over the past ten years, there have been 114 documented active goshawk breeding territories on the IPNF (see Project File). This figure is additive because it accounts for a single territory potentially being active in multiple years within that time frame. However, there have been a minimum of 41 different territories active over the past ten year period (see Project File). Although some level of known goshawk territory monitoring occurs on an annual basis across the Forest, all known territories are not surveyed every year. Consequently, the documented number of active territories represents the minimum number of active goshawk territories for a given year when in reality it is likely higher. Some surveys of potentially suitable goshawk nesting habitat are typically conducted on an annual basis in an attempt to locate, document and protect newly found active goshawk territories. Additionally, some suitable goshawk nesting habitat occurs in remote areas within designated roadless and wilderness areas that are not subject to surveys.

Based on information in field notes and nest survey forms for northern goshawk nest sites documented on the IPNF over the past ten years, the known nest sites are generally located in forested stands that fall within the habitat parameters considered to be suitable goshawk nesting habitat in the scientific literature (e.g. more open understory, larger diameter trees) (Hayward and Escano 1989, Warren 1990, Reynolds et al. 1992, Squires and Reynolds 1997, Graham et al. 1999). If there are any disparities between the literature and nest sites on the IPNF it would be the occurrence of some nest sites within fairly dense stands of smaller diameter trees and/or on steeper slopes. However, even within these types of stands goshawks appear to select microsites that contain the largest diameter trees and/or benches with a gentler slope.

During that same ten year time frame there have been 298 documented sightings of goshawks on the IPNF (see Project File). Although some of these sightings are associated with nest sites (e.g. breeding adults, young), some represent individuals present outside the breeding season, transient individuals or sightings outside of known breeding territories. Goshawk sightings and active territories have been documented throughout the Forest over the past ten years.

Project Level

See project level analysis located in project specific NEPA documents.

Forest Plan Compliance

The IPNF Forest Plan (USDA Forest Service 1987) selected the northern goshawk as a management indicator species of old growth habitats and established guidance for managing old growth in part to provide for viable populations of this species. It states, "Approximately 10 percent of the Forest will be maintained in old growth as needed to provide for viable populations of old growth dependent and indicator management species." Although it has been shown since the 1987 Forest Plan that northern goshawks are not old growth dependent, old growth is

addressed to illustrate continued compliance with the Forest Plan. To obtain the desired distribution, each designated old growth unit is managed to maintain approximately five percent old growth where it exists. The IPNF is meeting and exceeding the Forest Plan standard that calls for maintaining 10 percent of the forested portion of the IPNF as old growth (USDA Forest Service 2010a). FIA data and stand-level allocated old growth also provides evidence that the old growth is well distributed across the IPNF (USDA Forest Service 2010a).

Applicable Forest Plan Standard

7. Other Wildlife

> *a. Maintain at least minimum viable populations of management indicator species distributed throughout the Forest.*

Based on the best available science discussed in the Existing Condition section for this species, the IPNF contains substantially more than enough habitat distributed throughout the Forest to support a minimum viable population of northern goshawk. In addition, the best available science suggests that the goshawk population is, at a minimum, stable if not increasing slowly, and there has been no scientific evidence that the goshawk population is in decline.

Pileated Woodpecker

Background

The pileated woodpecker was originally designated as a MIS because it was generally regarded as an old growth indicator due to its need for large dead trees (snags) for nesting (Bull et al. 1990). Pileated woodpeckers are no longer considered to be a good indicator of old growth, although the importance of large snags remains a key component of their habitat regardless of the stand age. Prior to the implementation of the 1987 Forest Plan, timber harvest activities on the IPNF would have likely reduced snag densities in most cases. The long term impacts of these activities were the reduction of snags in all size classes. However, following the implementation of the Forest Plan and more recently the adoption of the Northern Region Snag Management Protocol (USDA Forest Service 2000) and Regional guidance on snag densities in North Idaho (Bollenbacher et al. 2009), snag retention and snag recruitment (leaving higher densities of green trees to produce good quality snags in the future) in harvested areas has risen dramatically.

Snag habitat on the Forest has been strongly influenced by vegetation succession, fire suppression, firewood cutting and insect and disease, along with natural fire events to a lesser degree. Most of the snags created by past wildfires have since fallen. Since 1910, much of the landscape has progressed and is now dominated by a high density of Douglas-fir, which are more susceptible to insect and disease at a younger age and therefore do not create larger, longer-lived snags.

Snags are an ephemeral resource that varies greatly throughout the life cycle of a forest stand. Most snags remain standing from a few years to a few decades. How long snags remain standing is a function of the structure, species composition, age of the stand, cause of tree mortality (e.g. fire, insects), size of the snag and site characteristics such as soil type and slope. Once they fall, snags become down wood that provide habitat for many wildlife species. Pileated woodpeckers often forage on down wood that is being heavily utilized by insects.

Snag numbers and size distribution can vary considerably within a stand. This high variability makes it more difficult to characterize the snag situation at the individual stand level. However, at large spatial scales the factors regulating snag numbers are more likely to balance out for longer periods of time. Therefore, it is important to look at mid and larger scale snag information to provide context for the snag situation for a specific area (USDA Forest Service 2010a).

Species Description and Habitat Associations

Pileated woodpeckers are relatively common in both cut and uncut mid-elevation forests, and appear to do well in a matrix of forest types (Hutto 1995). They nest in both previously harvested stands that contain remnant large trees and snags, and in mature and old growth forests. The presence of large trees for nesting appears to be more important than the age of the stand (Kirk and Naylor 1996, Giese and Cuthbert 2003). The pileated woodpecker is able to do well in young and fragmented forests that retain abundant remnant structure, such as large diameter snags and down woody debris (Mellon et al. 1992). Home range size for pileated woodpeckers varies considerably from approximately 200 acres to over 3,000 acres (Samson 2006b). However, studies in habitats most similar to those on the Northern Region show a home range size of approximately 1000 acres (Samson 2006b, Bull et al. 1992).

Dead trees are preferred over live trees for nesting and roosting, and nest trees are usually over 20 to 25 inches in diameter. The minimum canopy cover selected by pileated woodpeckers for nesting stands ranges in the scientific literature from 15 to 60 percent depending on the habitat type (Bull 1989, Bull et al. 1990, Warren 1990, Bull and Holthausen 1993, Bonar 2001). A large tree is needed because the cavity is typically 10 inches wide and up to 24 inches deep at heights of 20 to 60 feet above ground level (Bull 1989, Warren 1990). Live or dead western larch, and dead ponderosa pine, aspen, or black cottonwood are preferred nest tree species in the northern region (Warren 1990). New nest cavities are excavated each year in stands of approximately 50 to 100 acres of mature/old forest habitat with a relatively closed canopy (Warren 1990).

Most foraging occurs in logs and dead trees at least six inches in diameter, although large diameter (i.e., greater than 12”) dead wood is used most frequently (Bull et al. 1990). Since foraging habitat occurs in a wider ecological range of forest age structures, nesting habitat is considered the most critical and limiting feature for pileated woodpeckers. Natural disturbances such as insect outbreaks, disease, wind and fire are the primary mechanisms that insure a continuum of snags, downed dead wood and live, decaying trees which pileated woodpeckers depend on (Parks 2009).

Pileated woodpeckers forage for insects by gleaning insects from the surface of trees and plants, pecking into bark or by excavating into the interior portions of a tree. Although hairy woodpeckers dig smaller holes less than two inches in diameter or depth, pileated woodpecker excavation are distinguishable from them because they dig large excavations into a tree’s interior wood. Because this foraging behavior is exclusive to pileated woodpeckers, it can be readily used to identify the presence of pileated within a stand (Bull et al. 1990). Large chip size (one to three inches) can also be used to indicate pileated woodpecker foraging since no other woodpecker in this area can produce such large chips (Bull et al. 1990).

Recent foraging is distinguished from previous years by the condition of the exposed wood and chips. The wood chips and exposed wood in the excavation from recent foraging are lighter and brighter in color than older foraging sign (Bull et al. 1990). The older the excavation, the duller in color the interior of the excavation and the associated wood chips, as well as chips being more likely to be covered by debris on the ground. To determine the presence of pileated within an area, Bull et al. (1990) recommends walking transects in areas with the appropriate habitat characteristics and look for signs of recent foraging. In a report outlining pileated woodpecker surveys conducted by the Coeur d’Alene Audubon Society on the IPNF in 2003, it was noted that pileated woodpecker responses correlated very tightly with observations of pileated foraging sign. Although based on a relatively small sample size, the presence or absence of pileated foraging sign appeared to closely predict pileated presence (Coeur d’Alene Audubon 2003).

The pileated woodpecker is ecologically important as a keystone species and primary cavity nester because it excavates nest cavities in large diameter trees, which are later used by more than four dozen other species of migratory birds, bats and other mammals.

Threats

The primary threats to pileated woodpeckers that may be a result of forest management activities on public land include intense timber harvest that results in the conversion of forested habitats to non-forest habitat (e.g. regeneration harvest), forest fragmentation and removing downed wood generated by timber harvest activities.

The reduction in the amount of old forests and its associated structures (e.g., large-diameter snags and logs) along with the transition of older forests from being dominated by shade-intolerant tree species to being dominated by a dense structure of smaller diameter, shade-tolerant tree species, primarily due to fire exclusion (Wisdom et al. 2000) can also negatively impact pileated woodpeckers.

The change in species composition resulting from fire exclusion has slowly and methodically replaced such species as ponderosa pine, white pine and western larch, trending stands toward smaller and younger size and age classes that are more susceptible to insects and disease before reaching maturity. Consequently, snag production has somewhat shifted from the larger, longer-lived species to smaller, shorter-lived species.

The primary threats to pileated woodpecker that could occur as a result of activities on private land, thus out of the control of the Forest Service include 1) the conversion of forested habitats to non-forested habitat (e.g. regeneration harvest on private timber industry land, conversion of forest habitat to residential or agricultural areas), 2) short rotation, even-age forestry (e.g. commercial harvest on private timber industry lands), and 3) forest fragmentation.

Difficulties in Monitoring

Pileated woodpeckers have large home ranges (over 1,000 acres) and individuals can be located a couple of miles away from their location the previous day (Bull et al. 1990 and 1992; Samson 2006b). Consequently, this makes it more difficult to determine if it is the same individual that was previously documented unless you are able to cover an entire area (e.g. home range, subwatershed, patch of contiguous forest) during each survey, which can be difficult in areas such as the IPNF with large patches of continuous forest that are suitable for pileated woodpeckers.

Pileated woodpeckers will respond to recordings or human imitation of their calls. However, it must be a very good imitation of the territorial call or the birds will not respond. Additionally, the call of the northern flicker is very similar and can easily be mistaken for a pileated woodpecker (Bull et al. 1990). Pileated woodpeckers can also be located and identified by listening to their drumming. The drumming of the northern flicker and hairy woodpecker has similar characteristics to pileated and can easily be misidentified. Consequently, it is imperative that the surveys be conducted by people who have been trained and are experienced at distinguishing the difference between pileated woodpecker vocalizations and drumming and woodpecker species with similar characteristics (Bull et al. 1990).

Because so many other species of birds and mammals use nesting holes created by pileated woodpeckers, observing an adult or juvenile pileated woodpecker in the nest is the only totally reliable verification that it is an active pileated nest (Bull et al. 1990). Locating pileated foraging holes can also be a reliable way to document pileated woodpecker presence. However, determining the age of the foraging, particularly if it is not recent can be more difficult in areas with a lot of precipitation, such as North Idaho, because moisture increases the speed at which the excavated wood and wood chips darken in color (Bull et al. 1990).

Topography and habitat structure, such as horizontal cover and vegetation density, can also substantially impact the ability of surveyors to hear auditory responses, track the movements of individual pileated woodpeckers and consequently to locate and verify nest sites. Forested habitats typical of North Idaho comprised of fairly dense stands with high canopy closure on steeper slopes, increases the difficulty in locating, verifying and monitoring pileated woodpeckers and their nest cavities.

Existing Condition

According to NatureServe the pileated woodpecker has a global conservation status rank of G5. This indicates the species is common, widespread, abundant, and therefore secure. Although the vast majority of the IPNF is within

Idaho, it also includes some portions of Washington and Montana. The pileated woodpecker is listed S4 by Idaho and Washington and S3 by Montana, which indicates the species is apparently secure, but in Montana there may be some factors posing a potential risk (IDFG 2005, WDFW 2005, MNHP 2010). However, the pileated woodpecker is not a "species of greatest conservation need" in either Idaho or Montana. In 2011, the State of Idaho will be reviewing the conservation status of this species and the state rank will be adjusted, if necessary, to reflect information that has become available since the last revision in 2005 (Dixon, pers. comm. 2011).

According to the Partners in Flight Population Estimates Database, there are approximately 71,000 pileated woodpeckers in the Northern Rockies Bird Conservation Region (BCR), which includes North Idaho. Within just the North Idaho portion of the BCR the population is estimated to be approximately 9,000 pileated woodpeckers (Partners in Flight 2007). The North Idaho estimate has a lower data quality rating than the data for the Northern Rockies and therefore a lower accuracy due to a more limited amount of data. See Guide to the PIF Population Estimates Database: North American Landbird Conservation Plan 2004 for a detailed description of the data used and limitations of these population estimates (Blancher et al. 2007).

Northern Region

Based on methodology discussed briefly in the Northern Region Overview section above and described by Samson (2006a) and updated in Bush and Lundberg (2008) using FIA data, the Northern Rocky Mountain Ecological Province, of which the IPNF is a part, contained approximately 1,052,905 acres of pileated woodpecker nesting habitat and approximately 1,674,119 acres of foraging habitat.

Samson concluded (2006b), based on the synthesis of the best available science, that to maintain a minimum viable population of pileated woodpecker across Region One, there would need to be 95,382 acres of habitat, based on a net effective population size of 180 individuals (90 pairs) using an approximately 1,005 acre territory per pair. Even if only nesting habitat is used to meet the criteria for habitat to maintain a minimum viable population, Bush and Lundberg's updated 2008 FIA data results shows that the NRMEP alone contains over 11 times more acres of habitat than needed for the entire Region to maintain a minimum viable population of pileated woodpecker (Samson 2006b, Bush and Lundberg 2008).

Samson (2006b) also determined using a dispersal distance method developed for birds (Bowman 2003) that suitable habitat for the pileated woodpecker was within the species-specific dispersal distance, indicating that well-distributed habitat is not an issue in the Northern Region.

Samson (2006a) concluded the following with regard to the short-term viability of the pileated woodpecker in the Northern Region of the Forest Service based on his review of the pertinent literature and synthesis of the best available science, as well as his habitat assessments:

- No scientific evidence exists that the pileated woodpecker is decreasing in numbers.
- Increases in the extent and connectivity of forested habitat have occurred since European settlement.
- Well-distributed and abundant pileated woodpecker habitat exists on today's landscape.
- Level of timber harvest is insignificant in the Northern Region (in 2009, 4,854 ha of 9,045,255 ha or 0.05% of the forested landscape) and on the IPNF (551 ha of 999,733 forested ha or 0.06% of the forested landscape) (USDA Forest Service 2010c). Over the last ten years, the Northern Region harvested 76,649 ha or 0.85% of the forested landscape and the IPNF harvested 15,367 ha or 1.54% of the forested landscape (USDA Forest Service 2010b). These figures include all types of harvest and does not indicate that all harvested hectares resulted in habitat loss or degradation for pileated woodpeckers.

Population information based on the Breeding Bird Surveys compiled by the U.S. Geological Survey show a clear increase in the population trend for pileated woodpecker over the past 38 years both at the scale of the Northern Rockies and specific to Idaho. See Figure 4 and Figure 5 for a graph displaying this information. The time frame covered by this data is significant in that it covers a minimum of 4 to 5 generations of pileated woodpeckers over

almost four decades including the time period where the most intensive timber harvest activities occurred, and consistently reflects an increasing trend in their population (Bull and Jackson 1995, USDI Geological Survey 2010).

Figure 4. Population trend graph for pileated woodpecker from 1968 through 2006 in the Northern Rockies, including Idaho, based on USGS Patuxent Wildlife Research Center North American Breeding Bird Surveys (USDI Geological Survey 2010).

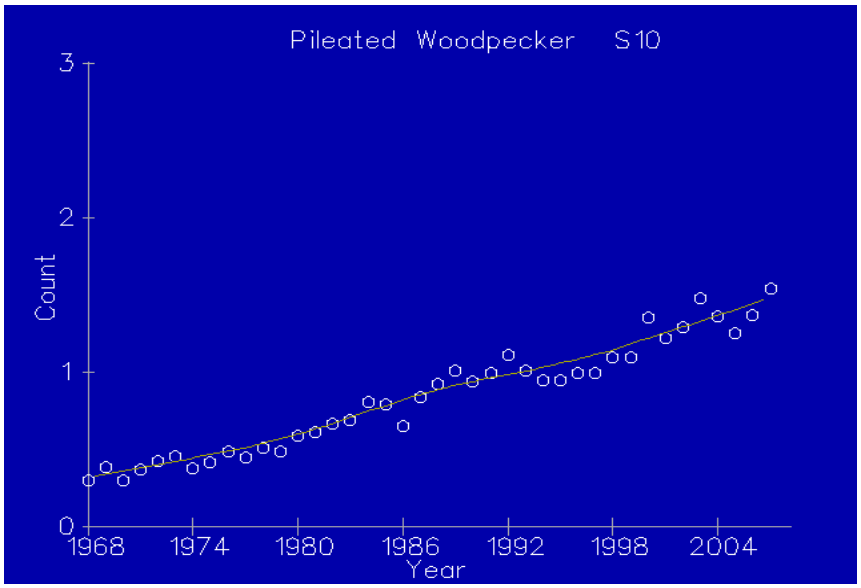
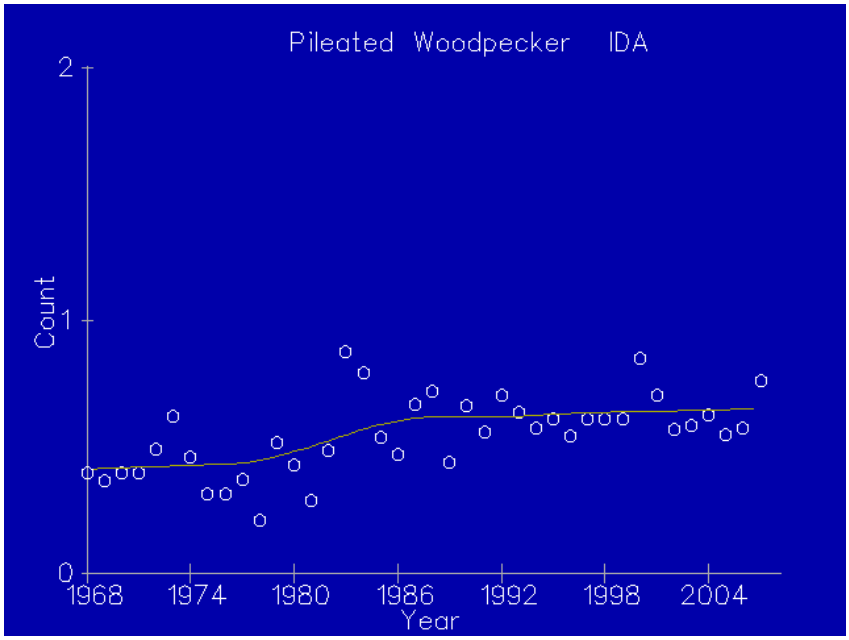


Figure 5. Population trend graph for pileated woodpecker from 1968 through 2006 in Idaho based on USGS Patuxent Wildlife Research Center North American Breeding Bird Surveys (USDI Geological Survey 2010).



Forest

Based on the analysis performed by the Northern Region, the IPNF contains approximately 430,932 acres of pileated woodpecker nesting habitat and approximately 729,994 acres of foraging habitat (Bush and Lundberg 2008).

Based on Samson habitat thresholds for maintaining a minimum viable population across the Region and the updated FIA information provided by Bush and Lundberg (2008), the IPNF contains over four times more pileated woodpecker nesting habitat on this Forest alone than is needed to provide viability at the Region level.

Based on FIA data collected on the IPNF, there are an estimated average of 10.4 snags per acre with a dbh between 10 inches and 19.9 inches. For snags 20 inches or larger there is an estimated average of 1.4 snags per acre (USDA Forest Service 2010a). Bull and Meslow (1977) concluded that to maintain a pileated woodpecker population in northeast Oregon, 0.14 snags per acre 20 inches dbh or greater were needed. The IPNF currently has 10 times more large snag habitat than that based on the FIA analysis.

According to Appendix X of the 1987 Forest Plan titled Snag and Woody Debris Management Guidelines, to support 100 percent of the maximum population of pileated woodpeckers in the habitat communities where they occur, the IPNF would need to maintain 1.4 snags per acre 20 inches dbh or greater. This recommendation is to reach 100 percent maximum population, which is a target far and above the standard of maintaining minimum species viability as required by the Forest Plan. Regardless, the FIA data shows the average number of snags per acre greater than 20 inches dbh on the IPNF meets the 100 percent maximum population requirement in Appendix X and therefore greatly exceeds the requirement of snags needed to maintain a minimum viable population of pileated woodpeckers.

Bull and Holthausen (1993) recommend maintaining a minimum of 0.65 snags per acre greater than 20 inches dbh. Again, the FIA data shows that the average number of snags per acre greater than 20 inches dbh is more than double the minimum recommendation.

Based on information from field notes and surveys, there have been 70 documented sightings, auditory detections and sign (e.g. feeding sites, excavated holes) of pileated woodpeckers on the IPNF in the past ten years (see Project File). Field going Forest Service personnel anecdotally report commonly seeing pileated woodpecker sign in most forested areas. Documented sightings, auditory detections and sign have increased over the past few field seasons (based on the IPNF wildlife data bases). However, the increase can likely be attributed to an increased emphasis on making sure pileated woodpecker sightings and sign are reported and documented. Because pileated woodpeckers and their sign are commonly seen across the Forest, the documenting of their presence has not occurred as frequently as more rare species. The documenting of their presence has occurred most often in project-related field visits by biologists and foresters. The lack of more documented pileated woodpecker presence on the Forest more closely reflects the absence of documentation rather than the absence of the species itself. Despite the lack of consistent reporting, pileated woodpeckers and their sign have been documented throughout the Forest over the past ten years. Additionally, documented pileated woodpecker sightings on the IPNF are generally located in forested stands that fall within the habitat parameters considered to be suitable pileated woodpecker habitat in the scientific literature (e.g. forested stands that retain large snags and down woody debris).

Project Level

See project level analysis located in project specific NEPA documents.

Forest Plan Compliance

The IPNF Forest Plan (USDA Forest Service 1987) selected the pileated woodpecker as a management indicator species for old growth habitats and established guidance for managing old growth to provide for viable populations of this species. It states, “Approximately 10 percent of the Forest will be maintained in old growth as needed to provide for viable populations of old growth dependent and indicator management species.” Although it has been shown since the 1987 Forest Plan that pileated woodpeckers are not old growth dependent, old growth is addressed here to illustrate continued compliance with the Forest Plan. To obtain the desired distribution, each designated old growth unit would be managed to maintain approximately five percent old growth where it exists. The IPNF is meeting and exceeding the Forest Plan standard that calls for maintaining 10 percent of the forested portion of the

IPNF as old growth (USDA Forest Service 2010a). FIA data and stand-level allocated old growth also provides evidence that the old growth is well distributed across the IPNF (USDA Forest Service 2010a).

Applicable Forest Plan Standards

7. Other Wildlife

> *b. Maintain at least minimum viable populations of management indicator species distributed throughout the Forest (see Appendix L for indicator species selection process Forest Plan, p. II-28).*

Based on the best available science discussed in the Existing Condition section for this species, the IPNF contains substantially more than enough habitat distributed throughout the Forest to support a minimum viable population of pileated woodpecker. Pileated woodpeckers and their foraging sign are also seen and documented across the Forest. In addition, the best available science indicates that the pileated woodpecker population is likely increasing in the Northern Rockies and there has been no scientific evidence that the pileated woodpecker population is in decline.

> *c. Maintain habitat for cavity nesting species and foraging substrates by implementation of the IPNF Snag and Woody Down Timber Guidelines (Appendix X).*

Based on the best available science discussed in the Existing Condition section for this species, the IPNF contains substantially more large snags per acre than are required by the IPNF Snag and Woody Down Timber Guidelines for maintaining a minimum viable population of pileated woodpeckers.

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Appendix B

Crosswalk between the Bull Trout Matrix of Pathways and Indicators (MPI) and Primary Constituent Elements (PCEs) of Critical Habitat

The Matrix of Pathway Indicators (MPI) for bull trout is used to evaluate and document baseline conditions and to aid in determining whether a project is likely to adversely affect or result in the incidental take of bull trout.

The MPI analysis incorporates 4 population indicators and 19 physical habitat indicators. Analysis of the habitat indicators can provide a thorough evaluation of the existing baseline condition and potential project impacts to the PCEs of critical habitat for bull trout. Appendix B Table 1 shows the relationship between the PCEs for bull trout critical habitat and the MPI habitat indicators.

The following paragraphs describe how the MPI indicators are related to evaluating the function of each PCE for bull trout critical habitat.

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

   The analysis of *floodplain connectivity* considers the hydrologic linkage of off-channel areas with the main channel and overbank-flow maintenance of wetland function and riparian vegetation and succession. Floodplain and riparian areas provide hydrologic connectivity for springs, seeps, groundwater upwelling and wetlands and contribute to the maintenance of the water table. The analysis of *changes in peak/base flows* addresses subsurface water connectivity and *substrate embeddedness* addresses inter-gravel flows. *Increase in drainage network* and *road density and location* address potential changes to groundwater sources and subsurface water connectivity. *Streambank condition*, *floodplain connectivity* and *riparian conservation areas* address groundwater influence. C*hemical contamination/nutrients* addresses concerns regarding groundwater water quality.

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

   Physical, biological or chemical barriers to migration are addressed directly through water quality habitat indicators, including *temperature*, *sediment, chemical contamination/nutrients* and *physical barriers*. The analysis of these indicators assess whether barriers have been created due to impacts such as high temperatures or high concentrations of turbidity or contaminants. Analysis of *change in peak/base flows* and *average wetted width/maximum depth ratio* assess whether changes in flow might create a seasonal barrier to migration. An analysis of *refugia* considers the habitat's ability to support strong, well distributed, and connected populations for all life stages and forms of bull trout.

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

   Floodplain connectivity and *riparian conservation areas* provide habitat to aquatic invertebrates, which in turn provide a forage base for bull trout. *Pool frequency and quality* and *substrate embeddedness* contributes to the variety and density of aquatic invertebrates and other fish species. Changes in *temperature*, *sediment*, and *chemical contaminants and nutrients* affect aquatic invertebrate production, floodplain and riparian areas provide habitat to aquatic invertebrates, which in turn provide a forage base for bull trout. The combined analyses of all the Matrix habitat indicators and the other seven PCEs provide information to assess whether there is an abundant food base in the

analysis area. Therefore, any impairment to the food base will be addressed by way of summarizing the biological and habitat indicators.

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

   Large woody debris increases channel complexity and creates pools and undercut banks, so the analysis of the current amounts and sources of *large woody debris* available for recruitment is pertinent to this PCE. *Pool frequency and quality* considers the number of pools per mile as well as the amount of cover and temperature of water in the pools. *Average wetted width/maximum depth ratio* is an indicator of channel shape and pool quality. Low ratios suggest deeper, higher quality pools. *Large pools,* consisting of a wide range of water depths, velocities, substrates and cover, are typical of high quality habitat and are a key component of channel complexity. Analysis of *off-channel habitat* describes side-channels and other off-channel areas. *Streambank condition* analyzes the stability of the banks*,* including features such as undercut banks. The analysis of both *riparian conservation areas,* and *floodplain connectivity, disturbance history, and disturbance regime* includes the maintenance of habitat and channel complexity, the recruitment of large woody debris, and the connectivity to off-channel habitats or side channels. Complex habitats provide refugia for bull trout and in turn, analysis of *refugia* assesses complex stream channels. All of these habitat indicators consider the numerous characteristics of instream bull trout habitat and quantify critical components that are fundamental to creating and maintaining complex instream habitat over time.

5. ***Water temperatures ranging from 2 to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures at the upper end of this range. Specific temperatures within this range will vary depending on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shade, such as that provided by riparian habitat; and local groundwater influence.***

   This PCE is addressed directly by the analysis of *temperature*. It is also addressed through consideration of *refugia*, which by definition is high quality habitat of appropriate temperature. Availability of refugia is also considered in analysis of *pool frequency and quality* and *large pools*. *Average wetted width/maximum depth ratio* is an indication of water volume, which indirectly indicates water temperature, i.e., low ratios indicate deeper water, which in turn indicates possible refugia. This indicator in conjunction with *change in peak/base flows* is an indicator of potential temperature and refugia concerns particularly during low flow periods. *Streambank condition*, *floodplain connectivity,* r*oad density and location* and *riparian conservation areas* address the components of shade and groundwater influence, both of which are important factors of water temperature. Stable streambanks and intact riparian areas, which include part of the floodplain, typically support adequate vegetation to maintain thermal cover to streams during low flow periods. *Road density and location* addresses the potential contributions of warm water discharges from stormwater ponds.

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

   The analyses for *sediment* and *substrate embeddedness* assess substrate composition and stability in relation to the various life stages of the bull trout as well as the sediment transportation and deposition. *Large woody debris* and *pool frequency and quality* affect sediment transport and redistribution within a stream and assessment of these indicators will clarify substrate composition and amounts. Analysis of *streambank condition* will provide insight into the amount of fine sediment contribution.

7. ***A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, they minimize departures from a natural hydrograph***.

   The analysis of *change in peak/base flows* considers changes in hydrograph amplitude or timing with respect to watershed size, geology, and geography. Analyses of *floodplain connectivity*, *increase in drainage network, road density and location, disturbance history,* and *riparian conservation areas* provides further information regarding possible interruptions in the natural stream hydrology. *Floodplain connectivity* considers the hydrologic linkage of off-channel areas with the main channel. Roads and vegetation management both have effects strongly linked to a stream's hydrograph. *Disturbance regime* ties this information together to consider how a watershed reacts to disturbance and the time required to recover back to pre-disturbance conditions.

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

   The quantity of permanent water will be considered in the analyses for PCE 4 natural hydrograph and PCE 5 springs, seeps, and groundwater, which include *floodplain connectivity*, *changes in peak/base flows*, *drainage network increase*, *disturbance history,* and *disturbance regime*. Analysis of *temperature, sediment, and chemical contaminates and nutrients* consider the quality of permanent water. Current listing under 303(d) and 305(d) status should be considered, as well as the causes for that listing. Analysis pertinent to sediment should address turbidity.

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

   This PCE is not well covered by existing MPI analyses. Some information may be available from analyses of population indicators, particularly the "persistence and genetic integrity" indicator.

Appendix B

Table 1. MPI indicators relevant to each of the Primary Constituent Elements of bull trout critical habitat (2010 version)

Diagnostic Pathway/Indicator	*PCE 1 - Springs, seeps, groundwater	PCE 2 - Migratory Habitats	PCE 3 - Abundant food base	PCE 4 - Complex habitats	PCE 5 - Water Temperature	PCE 6 - Substrate features	PCE 7 - Natural Hydrograph	PCE 8 - Water quality and quantity	PCE 9 - Predators and competitors
Water Quality									
Temperature		x	x		x			x	
Sediment		x	x			x		x	
Chemical Contaminants and Nutrients	x	x	x					x	
Habitat Access									
Physical Barriers	x	x	x						x
Habitat Elements									
Substrate Embeddedness	x		x			x			
Large Woody Debris				x		x			
Pool Frequency and Quality			x	x		x			
Large Pools				x	x				
Off-Channel Habitat				x					
Refugia		x			x				x
Channel Conditions and Dynamics									
Wetted Width/Maximum Depth Ratio		x		x	x				
Streambank Condition	x			x	x	x			
Floodplain Connectivity	x		x	x	x		x	x	
Flow/Hydrology									
Changes in Peak/Base Flows	x	x			x		x	x	
Drainage Network Increase	x						x	x	
Watershed Conditions									
Road Density and Location	x				x		x		
Disturbance History				x			x	x	x
Riparian Conservation Areas	x		x	x	x		x		
Disturbance Regime				x			x	x	

*Updated for 2010 proposed rule Khalupka 2-24-10