3.5 Fisheries

3.5.1 Scope of the Analysis

The effects to fisheries were analyzed by individual sixth level watershed (hydrologic unit) or combinations of sixth level watersheds determined by representatives of the Forest, FWS, and NMFS as most indicative of the quality of habitat for listed fishes on the Forest.

Issues and Indicators

Fisheries Issue 1: Travel management may impact habitats for threatened, endangered, and sensitive fishes including the bull trout (a Management Indicator Species).

Indicators:

- Change in the watershed condition indicator for substrate embeddedness.
- Change in the watershed condition indicator for stream bank condition.

Background:

This analysis determines the relative effects of alternatives to the existing travel management plan on fish species of concern and their habitat. Fish species of concern are defined as those species with long-term viability at risk. This includes species listed or proposed for listing under the Endangered Species Act (ESA), as amended, 16 USC 1531 *et seq*., and those on the Forest Service Intermountain Region sensitive species list. Collectively these species are referred to as TES species. Other species of interest or concern are Forest Management Indicator Species (MIS). Management Indicator Species are species designated by the Forest and used to track effects of management activities.

The following species are listed as threatened under ESA (some with designated critical habitat): Snake River spring/summer and fall Chinook salmon (*Oncorhynchus tshawytscha*) and their designated critical habitat, Snake River steelhead (*Oncorhynchus mykiss*) and their designated critical habitat, and Columbia River bull trout (*Salvelinus confluentus*). Bull trout were designated a Management Indicator Species (MIS) for the PNF. Westslope cutthroat trout (*Oncorhynchus clarki lewisi*), are a Forest Service sensitive species.

Effects to other fish species, such as redband trout, and other aquatic organisms were not found to be issues for a number of reasons including the species and/or habitat are widespread across the Forest. For these species, the discussion of changes to watershed conditions provides an indication of potential effects (see the Soil and Water Resources section).

This analysis also determines the relative effects of alternatives to the existing travel management on Essential Fish Habitat (EFH), in accordance with applicable requirements of section 305(b) of the Magnuson-Stevens Act (MSA), implementing regulations in 50 CFR Part 600.920. EFH is coincident with designated critical habitat for Chinook salmon on the Forest, so all discussion of effects to critical habitat discloses effects to EFH.

Effects to listed fish species on the PNF are typically analyzed through changes in habitat or population variables as defined in Appendix B of the Forest Plan (Forest Plan 2003). These variables are called watershed condition indicators (WCIs). In this analysis WCIs are referred to simply as indicators. Travel management is most likely to affect the following two indicators: substrate embeddedness and stream bank condition. Selection of these indicators was based on studies of the effects of roads and trails on fish habitat. The indicators are indexed using modifications of definitions in Appendix B in order to use the best available information.

Substrate embeddedness was chosen as an indicator of fish habitat quality because it indicates the accumulation of fine sediment into fish habitat. Fine sediment accumulations are detrimental to habitat of TES trout and salmon on the PNF. Nelson et al. (2004) and other researchers have related increased road densities to increased sediment deposition in fish habitat. Relative future changes for this indicator were indexed by the relative change in total acreage open to motorized use, based on an assumption that embeddedness is related to the total area susceptible to erosion. This assumption is supported as discussed by the relationship to roads discussed below.

Stream bank condition was used as an indicator for a variety of potential effects to fish habitat quality. Stream bank condition is assumed to be inversely related to the number of stream crossings indexed by system roads and trails intersecting streams. This number was obtained from the PNF Geographic Information System (GIS). The GIS contains maps of roads and trails and waterways. This method likely underestimates the actual number of crossings, but does indicate relative changes by alternative. The potential number of spills of petroleum fuel and subsequent contamination of streams, as well as take of listed species from vehicles fording streams is assumed to be directly proportional to the number of stream crossings. This metric is assumed to be directly proportional to the areas adjacent to roads and trails open to camping, and the latter is not determined separately.

In this analysis, road and trail mileage were assumed to be directly proportional to number of crossings and hence to stream bank condition. Road density was also used to make professional judgments about the likely condition of substrate embeddedness where there is limited data. In general, greater road densities have been correlated with greater impacts to fish habitat including increased substrate embeddedness, decreased stream bank condition, reduced large woody debris, and impaired habitat connectivity (Furniss et al. 1991, Nelson et al. 2004, Adams and Zurstadt 2005).

Changes in these indicators are analyzed by an individual sixth level watershed (hydrologic unit) or combinations of sixth level watersheds as directed by Appendix B of the Forest Plan (Forest Plan 2003). For simplicity, true sixth level watersheds as well as combination of watersheds are hereafter referred to as “watersheds.”

Changes were analyzed for those watersheds containing TES and MIS fish species and where changes to the Travel Plan were proposed. Many watersheds occur within one management area (MA) on the PNF. The watersheds are listed in Table F-2 under their respective river basins.

The functioning of each indicator in relation to habitat for listed fish species was determined based on definitions provided in the Forest Plan and Nelson and Burns (2005): “functioning appropriately” (FA), “functioning at risk” (FR), or “functioning at unacceptable risk” (FUR). A more in-depth description of these ratings is provided in the Fisheries Specialist Report and in the Affected Environment section. The Biological Assessments in the project record used for consultation pursuant to Endangered Species Act compliance also contain additional detail.

3.5.2 Forest Plan Direction

Forest Plan direction that guides management of fisheries and is pertinent to the Travel Management Plan is provided in Table F-1.

Table F-1: Forest Plan Direction for Fisheries Pertinent to the Travel Management Analysis.

Number	Direction	Page
SWST01	Management actions shall be designed in a manner that maintains or restores water quality to fully support beneficial uses and native and desired non-native fish species and their habitat, except as allowed under SWRA Standard #4 below. Use the MATRIX located in Appendix B to assist in determining compliance with this standard.	p. III-21
SWST08	Fish passage shall be provided at all proposed and reconstructed stream crossings of existing and potential fish-bearing streams unless protection of pure-strain native fish enclaves from competition, genetic contamination, or predation by exotic fishes is determined to be an overriding management concern	p. III-22
SWGU01	Federal, state, county, tribal, and regulatory agency priorities should be considered early in the process of subbasin review, fine- and site/project-scale analyses, and restoration priorities to help ensure priorities compliment each other where possible, or at least minimize conflicts	p. III-23
SWGU02	When doing fine-scale assessments, the MATRIX in Appendix B should be used to assist in establishing reference and current conditions. Based on a comparison of current and desired conditions, identify management opportunities for watershed and aquatic restoration	p. III-23
TEST01	The Forest shall consult with the NMFS and Fish and Wildlife Service as needed, and appropriate, to comply with consultation requirements under the Endangered Species Act and Magnuson-Stevens Act	p. III-11
TEST02	For Forest-wide, watershed, or project-level Biological Opinions (BOs) and Biological Assessments (BAs) with letters of concurrence, requirements shall continue to apply until their expiration date unless these documents are specifically updated during further review with related regulatory agencies. Exception to this standard: The 1995 and 1998 Chinook and Steelhead Biological Opinions and 1998 Bull Trout Biological Opinion are replaced by the Biological Opinion for this Forest Plan revision…	p. III-11
TEST03	Design and implement projects to meet the terms of Forest Service approved portions of recovery plans. If a recovery plan does not yet exist, use the best information available (for example, BAs, BOs, letters of concurrence, Forest Service-approved portions of Conservation Strategies) until a recovery plan is written and approved.	p. III-11
TEST06	Management actions shall be designed to avoid or minimize adverse effects to listed species and their habitats. For listed fish species, use Appendix B for determining compliance with this standard	p. III-14
TEGU01	Discretionary actions should avoid take of listed species, and actions where the Forest's discretion is limited should minimize adverse effects that could lead to a take	p. III-14
TEGU02	For proposed actions that may affect potential habitat of TEPC species, identify potential habitat and determine species presence within or near the project area. Document the rationale for not identifying potential habitat and determining species presence for TEPC species in the project record	p. III-14
TEGU03	Management actions in occupied Proposed or Candidate species habitat should be modified or relocated if the effects of the actions would contribute to a trend toward ESA listing for these species	p. III-14

The desired condition for all habitats of threatened, endangered and sensitive fishes is that they are functioning appropriately as defined in the Forest Plan, Appendix B (Forest Plan 2003), and Nelson and Burns (2005).

3.5.3 Existing Condition

Existing Condition - Fish Species of Concern

The distribution of fish species of concern is shown for each watershed or combination of watersheds in Table F-2. The following species and habitat are addressed:

Chinook salmon

Species Distribution: Snake River spring/summer and fall Chinook salmon, listed as threatened by the National Marine Fisheries Service (NMFS) (Federal Register 1992: 57FR14653), occur on the Forest. Hereinafter, all references to Chinook salmon are for the listed species.

Critical Habitat: Critical habitat for Chinook salmon includes all river reaches presently or historically accessible and adjacent riparian zones, except reaches above impassable natural falls. The SFSR section 7 watershed and all of the subwatersheds previously defined contain habitat elements necessary to support Chinook salmon, and are at least partially accessible to the fish. Designation of critical habitat (Federal Register 1993: 58FR68543) specifically defines geographic areas, and essential habitat elements.

Essential Fish Habitat (EFH), is defined and analyzed in accordance with applicable requirements of section 305(b) of the Magnuson-Stevens Act (MSA), implementing regulations in 50 CFR Part 600.920. EFH is coincident with designated critical habitat for Chinook salmon on the Forest.

Steelhead

Species Distribution: Snake River steelhead, listed as threatened by NMFS (Federal Register 1997: 62FR43937), occurs on the Forest. Hereinafter, all references to steelhead are for the listed species.

Critical Habitat: The final rule designating critical habitat for steelhead was published by NMFS on September 2, 2005 and took effect in 2006 (Federal Register 2006: 71FR52629). The Forest provides spawning and juvenile rearing, adult holding and migration habitat.

Bull trout

Species Distribution: Columbia River bull trout were listed as threatened by the United States Fish and Wildlife Service (USFWS) (Federal Register 1998: 63FR31647). Columbia River bull trout exist on the Forest. Hereinafter, all references to bull trout are for the listed species. Bull trout were identified as the only aquatic Management Indicator Species (MIS) in the Payette National Forest's Land and Resource Management Plan (Forest Plan 2003).

Critical Habitat: No critical habitat for bull trout was designated by the USFWS (Federal Register 2005: 70FR56211) that is affected by the Payette National Forest.

Westslope Cutthroat Trout

Species Distribution: Westslope cutthroat trout are designated by the Regional Forester as a sensitive species and occur on the PNF. Westslope cutthroat trout were petitioned for listing (Federal Register 1998: 63FR31691) but were determined by the USFWS to not be warranted in 2000 (Federal Register 2000: 65FR20120.)

Critical Habitat: Critical habitat is not applicable to Westslope cutthroat trout.

Substrate Embeddedness and Stream Bank Condition

The existing condition of the indicator of substrate embeddedness is displayed in Table F-2. Substrate embeddedness was evaluated from monitoring data using cobble embeddedness, free matrix counts, and core sampling or survey data based on percent fines, surface fines, or inferences based on roads. If these data were unavailable, then substrate embeddedness was evaluated based on professional judgment (PJ). The various datasets were reviewed for each watershed or a group of watersheds and a rating of "functioning appropriately" (FA), "functioning at risk" (FR), or "functioning at unacceptable risk" (FUR) was assigned based on direction provided in Appendix B of the Forest Plan (Forest Plan 2003) and Nelson and Burns (2005).

The existing condition of the indicator of stream bank condition is displayed in Table F-2. Stream bank condition is assumed to be inversely related to the number of stream crossings by roads and trails. The number of crossings is also assumed to be proportional to the potential number of spills of petroleum fuel and subsequent contamination of streams, as well as take of listed fishes from vehicles crossing fords. Stream bank condition is therefore a surrogate for many potential effects in this analysis.

Stream bank condition was initially rated based on the number of stream crossings by roads and trails in each watershed or combination of watersheds. Then other factors were considered including the potential for fuel spills, disturbance of spawning fish, erosion at crossings, and take from vehicle fording of streams and a final rating was assigned of FA, FR, or FUR. Based on studies of the adverse effects of roads on fish habitat (Furniss et al 1991; Bonaminio 2004; Nelson et al. 2004; Adams and Zurstadt 2005) any crossing of a stream by a road was assumed to cause an adverse effect to listed fishes or their habitat and a rating of FA could not be assigned. Due to observed effects of trail crossings (Fisheries Specialist Report: Project Record), when the number of stream crossings per mile exceeded one the "Stream bank" indicator was rated as FR. When the number of stream crossings per mile exceeded more than twenty, the condition was considered FUR. These categories are used, because any single crossing can cause take of listed fishes, and because the level of use of fords that might cause take is unknown at the scale of this analysis. Distinction between FR and FUR is arbitrarily determined, because the distinction makes no difference to showing which alternatives are consistent with the Forest Plan.

Table F-2 shows that no watershed is rated as FA for both indicators of substrate embeddedness and stream bank condition. Most watersheds are FR or FUR for substrate embeddedness or stream bank condition, or both. A single summary of the habitat functionality is displayed here for the sake of clarity. In watersheds rated as FR or FUR for one or more indicators, any management actions must have short or long-term benefits to be consistent with the Forest Plan. More details about individual subwatersheds will be in the biological assessments prepared for consultation pursuant to the Endangered Species Act and those documents will be included in the project record.

Table F-2. Existing Condition of Relevant Fish Habitat Indicators for Affected Watersheds and Combinations of Watersheds

RIVER BASIN Watershed or combination of watersheds	Species and Habitat	Substrate Embeddedness	Stream Bank Condition (# road / # trail crossings of streams)
DEEP CREEK			
Deep Creek	Bull trout (BT), Chinook salmon (CK), Critical Habitat (CH), Steelhead (SH), SH proposed CH(SHPCH)	FR: Professional Judgment (PJ); 2002:26.3 % embedded; 2003: 20.9 % embedded; 2004: 32.1 % embedded; 2005: 28.5 % embedded; (Nelson 2006)	FUR 1 /16
BROWNLEE RESERVOIR			
Indian Creek	BT	FUR: Data, PJ, Percent fines: Indian Creek (2004): 23.2% Un-named tributary (1992): 14.7% Placer Creek (1992): 5.7% Mann Creek (1992): 75.5% Ladder Creek (1992): 32% Huntley Gulch (2003): 20.6% Camp Creek (1992): 64%	FUR 39/14
Bear Creek Crooked River	BT	FR: Data, PJ based on poorest condition, Percent fines: Bear Creek (2000): 7.2% Little Bear Creek (2000): 12.1% Mickey Creek (2000): 4.3% Wesley Creek (2000): 6.2% Crooked River (1994): 12.6%	FUR 566/35
WEISER RIVER			
East Fork Weiser River	BT	FUR: Data, PJ, Percent fines: East Fork Weiser (2000): 7% Shingle Creek (1994): 30.9% Joker Creek (1994): 14% Dewey Creek (1994): 23.5% Cold Springs Cr (1994): 34% Bench Creek (2004): 19.8%	FUR 163/1
Upper Hornet Creek	BT	FR: Data, PJ, Percent fines: Hornet Creek (2001): 6.9% Placer Creek (2001): 35.3%	FUR 24/0
Upper Little Weiser River Anderson Creek	BT	FR: Data, PJ based on most bull trout being in Anderson and Sheep Creeks, Percent fines: Little Weiser Rvr (2005): 22.7% Fourbit Creek (1993): 95% Wolf Creek (2005): 19.2% Unnamed tributary (2005): 25.6% Anderson Creek (2005): 8.5%	FUR 194/28

Table F-2. Existing Condition of Relevant Fish Habitat Indicators for Affected Watersheds and Combinations of Watersheds

RIVER BASIN Watershed or combination of watersheds	Species and Habitat	Substrate Embeddedness	Stream Bank Condition (# road / # trail crossings of streams)
		Bull Corral Cr (2005): 23.3% Sheep Creek (2005): 3.3%	
LITTLE SALMON RIVER			
Mud Creek Big Creek Little Salmon River-Lower Goose Creek Upper Goose Creek Little Salmon River-Sixmile Creek Little Salmon River-Lower Meadows Valley Little Salmon River-Round Valley Creek	BT, CK, CH, SH, SHPCH, Westslope cutthroat trout (WC) in downstream areas only	FUR: Data, PJ, Percent fines: Goose Creek (2003): 19.2% (FA) Goose Creek (2004): 13.8% (FA) Goose Creek (2005): 25.3% (FR) Thorn Creek (2003): 27.5% (FR) Thorn Creek (2004): 23.7% (FR) Thorn Creek (2005): 9.8% (FA) Mud Creek (2003): 23.5% (FR) Mud Creek (2004): 27.3% (FR) Mud Creek (2005): 14.4% (FA) (Zurstadt & Bonaminio 2005; Nelson 2006) Sixmile Creek (2005): 35.9% (FUR) Threemile Creek (2005): 32.1% (FUR) Cobble embeddedness; (calculated from free matrix data on file at PNF SO w/2004 formula)	FUR 386 /12
Hard Creek Hazard Creek	BT, CK, CH, SH, SHPCH, WC	FR: Data, PJ, Cobble embeddedness: Hazard Creek (2003): 21.3% (FR) Hazard Creek (2004): 10.3% (FA) Hazard Creek (2005): 18.2% (FA) Hard Creek (2003): 24.5% (FR) Hard Creek (2004): 21.1% (FR) Hard Creek (2005): 33.2% (FUR) (Zurstadt & Bonaminio 2005; Nelson 2006)	FUR 84/41
Little Salmon River-Elk Creek	BT, CK, CH, SH, SHPCH	FA: Data, PJ, Percent fines: Elk Creek (BLM 1994): 3%	FUR 4/14
Upper Rapid River	BT, CK, CH, SH, SHPCH, WC	FA: Data, PJ, Cobble embeddedness: Rapid River (2003): 52.5% (FUR) Rapid River (2004): 36% (FUR) (Zurstadt & Bonaminio 2205; Nelson 2006) Relatively unroaded watershed, though embeddedness levels are elevated, judged to be functioning appropriately for this watershed.	FUR 11/60
Boulder Creek	BT, CK, CH, SH, SHPCH, WC	FR: Data, M, PJ, Cobble embeddedness: Boulder Creek (2003): 21.9% (FR) Boulder Creek (2004): 17.4% (FA) Boulder Creek (2005): 17.0% (FA) (Zurstadt & Bonaminio 2005; Nelson 2006)	FUR 144/14

Table F-2. Existing Condition of Relevant Fish Habitat Indicators for Affected Watersheds and Combinations of Watersheds

RIVER BASIN Watershed or combination of watersheds	Species and Habitat	Substrate Embeddedness	Stream Bank Condition (# road / # trail crossings of streams)
MAIN SALMON RIVER TRIBUTARIES: LITTLE SALMON RIVER TO SOUTH FORK SALMON RIVER			
Middle Salmon-Indian California Creek Middle Salmon-Bear Middle Salmon-Carey	BT, CK, CH, SH, SHPCH, WC	FR: Data, PJ, Surface fines: California Ck 4% (unpubl. data PNF 1995), 25% (Overton et al. 1995). Carey Ck 16% (unpublished data, PNF 1995), 15-22% (unpublished data, PNF 2005)	FUR 51/13
Upper Warren Creek Middle Warren Creek Lower Warren Creek	BT, CK, CH, SH, SHPCH, WC	FR: Data, PJ, Surface fines (Raleigh 1995)	FUR 71/31
Little French Creek Lower French Creek	BT, CK, CH, SH, SHPCH, WC	FUR: Data, PJ, Cobble embededness: Little French and French: 32.5% (Zurstadt and Bonaminio 2004)	FUR 36/58
Elkhorn Creek	BT, CK, CH, SH, SHPCH, WC	FR: Data, PJ, Cobble embededness = 26% (Zurstadt and Bonaminio 2004)	FUR 14/15
Partridge Creek	BT, CK, CH, SH, SHPCH, WC	FA: Data, PJ, Surface fines: 6%, 82%, & low road densities	FR 0/13
Lake Creek	BT, CK, CH, SH, SHPCH, WC	FA: Data, PJ, Surface fines: 2, 6, 8, 25, 3, 5%, & low road densities	FR 0/13
SOUTH FORK SALMON RIVER			
SF Salmon-Goat Creek Blackmare Creek SF Salmon-Fourmile SF Salmon-Camp Cr Buckhorn Creek	BT, CK, CH, SH, SHPCH, WC	FUR: Data (summarized in project record), PJ (Nelson et al. 2006a, Nelson et al. 2006b, Nelson and Burns 2005)	FUR 93/134
EF South Fork Salmon River-Loosum Creek Lower EF SF Salmon	BT, CK, CH, SH, SHPCH, WC	FR: Data (summarized in project record), PJ (Nelson et al. 2006a, Nelson et al. 2006b, Nelson and Burns 2005)	FUR 22/17
Upper Secesh River Secesh River-Summit Secesh River-Victor Cr Secesh River-Zena Cr	BT, CK, CH, SH, SHPCH, WC	FA: Data (summarized in project record), PJ (Nelson et al. 2006a, Nelson et al. 2006b, Nelson and Burns 2005)	FUR 87/53
SF Salmon-Rock Creek Sheep Creek Bear Creek Pony Creek SF Salmon-Grouse Cr Lower SF Salmon	BT, CK, CH, SH, SHPCH, WC	FUR: Data (summarized in project record), PJ (Nelson et al. 2006a, Nelson et al. 2006b, Nelson and Burns 2005)	FUR 40/94
BIG CREEK			
Upper Big Creek	BT, CK, CH, SH, SHPCH, WC	FA: Data, PJ Big Creek: Cobble Embeddedness: 11.3% (FA) Free Matrix Data: 31.9% (FA)	FUR 34/20

Table F-2. Existing Condition of Relevant Fish Habitat Indicators for Affected Watersheds and Combinations of Watersheds

RIVER BASIN Watershed or combination of watersheds	Species and Habitat	Substrate Embeddedness	Stream Bank Condition (# road / # trail crossings of streams)
		Government Creek: Cobble Embeddedness: 37.6% (FUR) Free Matrix Data: 16.8% (FUR) Jacobs Ladder: Cobble Embeddedness: 20.3% (FA) Free Matrix Data: 41.0% (FA) Lower Logan: Cobble Embeddedness: 43.5% (FUR) Free Matrix Data: 13.5%(FUR) Upper Logan: Cobble Embeddedness: 25.8% (FR) Free Matrix Data: 27.2 (FA) Smith Creek: Cobble Embeddedness: 23.8% (FA) Free Matrix Data: 18.5% (FR) (Nelson and Burns 2004) Monumental Creek (3 sites): 5-yr mean Free Matrix Data: 28-41% (FA) 2003 Cobble Embeddedness: 2-20% (FA) 2004 Free Matrix Data: 25-45% (FA) The weight of the data is assigned FA based on the condition the main stem of Big Creek, and the fact that Monumental Creek is FA (Nelson et al. 2006a and Nelson et al. 2006b, Nelson and Burns 2005)	

Note: Affected fish species, and/or critical habitat may be in downstream areas.

3.5.4 Environmental Consequences

Effects Common to All Action Alternatives

Direct effects of travel plan implementation were analyzed for the portion of the watershed or combination of watersheds on National Forest System lands. Direct effects to listed, sensitive and MIS fish species from travel management are expected to be adverse in all alternatives, including the No Action Alternative. Adverse effects occur due to erosion and sediment generated by road and trail facilities and other uses, including motorized travel off roads and trails. Adverse effects occur due to stream instability caused at road and trail crossings, and take of listed salmonids at fords. Adverse effects would be minimized by activities proposed in the action alternatives (see description by alternative below). The action alternatives would lessen the rate of degradation, thereby benefiting fish species compared to the No Action Alternative except within subwatersheds in Alternative C.

General effects of road crossings on stream bank condition are described by Furniss et al. (1991). On the Payette National Forest, Bonaminio (2004) documented a variety of effects to fish habitat

that indicate as miles of access increase, the greater the degree of effect to fish habitat. Nelson et al. (2004) described that the amount of road was inversely related to fish habitat quality on the Forest. Adams and Zurstadt (2005) also demonstrated that fish passage barriers were directly related to the number of roads, because most road culverts on the Forest do not pass all life stages of all fish species. Roads and trails paralleling streams can interfere with large wood reaching the stream and cause increased erosion and decreased stream bank condition.

Mitigation measures to reduce effects to listed species were identified for travel management during consultation with the NMFS and USFWS in 2001. These have not been effective at avoiding all take, especially at fords crossing streams in spawning habitats. In this analysis, we compare the relative differences of effects between the existing baseline and alternatives for travel management.

Bull trout population viability and trends on the Payette National Forest have been documented by Burns et al. (2005). A variety of factors were used to assess viability including the number of life histories present, the degree of population fragmentation, the amount of road and other variables. Viability varies across the Forest. Decreasing populations of bull trout in the Weiser River and other westerly portions of the Forest are considered the least viable. Bull trout are most viable in the Salmon River basin of the Forest. Population fragmentation and lower population viability are associated with the highest road densities.

No alternative would result in changes in road density. While some roads may be closed to use, the travel plan would not remove any roads or trails from the landscape through decommissioning and recontouring of the roadbed. Road density has a strong association with substrate embeddedness and stream bank condition. Because the number of roads and trails on the landscape does not change, only marginal changes are shown in the indicators used. Changes of roads or trails open to motorized use were not considered to be important in the analysis of effects when the estimated change was less than one mile by GIS calculation, because of uncertainty about the reliability of such small mapped changes; often, locations of roads and trails near watershed boundaries are mapped with a high degree of uncertainty with respect to actual direction of drainage.

All action alternatives would change the amount of acreage open to motorized use. Cross-country motor vehicle use, particularly near streams, could cause disturbance and erosion leading to increased substrate embeddedness. The effects analysis of changes in the amount of acreage open to motorized use looked at two factors: 1) the amount of area currently open and 2) the location of the acres that remain open to motorized travel. The acreage change is of less significance when more of a watershed is already closed to use. For example, more of the South Fork Salmon River basin is closed to motorized use than the Weiser River basin. However, even where large areas are closed to cross-country motorized travel, the smaller areas that remain open to use could still cause erosion and sediment delivery if they occur near streams. Therefore, in the analysis of the effects of changes in areas open to motorized cross-country travel and the subsequent relative change in substrate embeddedness, professional judgments were made about the relative significance of the two factors described above.

Professional judgments were based on the amount of area currently open, and the location of the acres remaining open to motorized travel. These two factors were also considered in the analysis of the effects of the alternatives on stream bank condition. For brevity, only the numbers of road and trail crossings of streams are displayed in Table F-2. The number of acres open to motorized travel is not displayed for the stream bank condition indicator, but the relative effects were taken into account. The effects on stream bank condition were determined to be greatest for roads and ATV trails followed by two-wheel motorized trails and then trails without motorized use. The

number of stream crossings by roads and trails was assumed to be directly proportional to road or trail length.

Direct and Indirect Effects by Alternative

Alternative A – No Action

Under Alternative A (No Action), all but five watersheds are expected to degrade the substrate embeddedness indicator in the short and long term due to increased erosion from motorized use, especially in areas open to cross-country motor vehicle use (Table F-3). The exceptions are watersheds where conditions are expected to be maintained. The increased erosion is expected to result in increased substrate embeddedness in fish habitat. The existing condition would be temporarily maintained, because the time period is too short to realize the increased effects of increasing traffic. Direct effects of Alternative A are not consistent with Forest Plan direction to avoid degradation of watershed condition indicators, because there is no long term benefit. If long term Forest Plan objectives were to be met, they would likely be met piecemeal through the beneficial effects from other projects. Forest Plan direction is to revise the Travel Management Plan, so changes in travel and subsequent benefits would occur under Alternative A at some unknown rate.

Stream bank conditions are expected to be maintained in all watersheds under Alternative A because there is no change in the number or type of stream crossings.

Table F-3. Effects of Alternative A on the Fish Habitat Indicators in Affected Watersheds or Combinations of Watersheds Based on Whether Conditions Would Be Improved (I), Maintained (M), or Degraded (D)

Pathways & Indicators	Effects of Alternative A				
	Overall Effect	Expected Trend			Discussion of Effects
		Temporary	Short-term	Long-term	
Deep Creek					
Substrate Embeddedness	D	M	D	D	No change from FR
Stream bank Condition	M	M	M	M	No temporary change from FUR; roads and trails continue with existing effects.
Indian Creek					
Substrate Embeddedness	D	M	D	D	No change from FUR; cross-country motor vehicle use accelerates erosion over time.
Stream bank Condition	M	M	M	M	No change from FUR; roads and trails continue with existing effects.
Bear Creek and Crooked River					
Substrate Embeddedness	D	M	D	D	No temporary change from FR; cross-country motor vehicle use accelerates erosion over time.

Table F-3. Effects of Alternative A on the Fish Habitat Indicators in Affected Watersheds or Combinations of Watersheds Based on Whether Conditions Would Be Improved (I), Maintained (M), or Degraded (D)

Pathways & Indicators	Effects of Alternative A				
	Overall Effect	Expected Trend			Discussion of Effects
		Temporary	Short-term	Long-term	
Stream bank Condition	M	M	M	M	No change from FUR; roads and trails continue with existing effects.
East Fork Weiser River					
Substrate Embeddedness	D	M	D	D	No temporary change from FUR; cross-country motor vehicle use accelerates erosion over time.
Stream bank Condition	M	M	M	M	No change from FUR; roads and trails continue with existing effects.
Upper Hornet Creek					
Substrate Embeddedness	D	M	D	D	No temporary change from FR; cross-country motor vehicle use accelerates erosion over time.
Stream bank Condition	M	M	M	M	No change from FUR; roads and trails continue with existing effects.
Upper Little Weiser River, Anderson Creek					
Substrate Embeddedness	D	M	D	D	No temporary change from FR; cross-country motor vehicle use accelerates erosion over time.
Stream bank Condition	M	M	M	M	No change from FUR; roads and trails continue with existing effects.
Mud Creek, Big Creek, Little Salmon River-Lower Goose Creek, Upper Goose Creek, Little Salmon River-Sixmile Creek, Little Salmon River-Lower Meadows Valley, & Little Salmon River-Round Valley Creek					
Substrate Embeddedness	D	M	D	D	No temporary change from FUR; cross-country motor vehicle use accelerates erosion over time.
Stream bank Condition	M	M	M	M	No change from FUR; roads and trails continue with existing effects.
Hard Creek & Hazard Creek					
Substrate Embeddedness	D	M	D	D	No temporary change from FR; cross-country motor vehicle use accelerates erosion over time

Table F-3. Effects of Alternative A on the Fish Habitat Indicators in Affected Watersheds or Combinations of Watersheds Based on Whether Conditions Would Be Improved (I), Maintained (M), or Degraded (D)

Pathways & Indicators	Effects of Alternative A				
	Overall Effect	Expected Trend			Discussion of Effects
		Temporary	Short-term	Long-term	
Stream bank Condition	M	M	M	M	No change from FUR; roads and trails continue with existing effects.
Little Salmon River-Elk Creek					
Substrate Embeddedness	M	M	M	M	No temporary change from FA; cross-country motor vehicle use accelerates erosion over time.
Stream bank Condition	M	M	M	M	No change from FUR; roads and trails continue with existing effects.
Upper Rapid River					
Substrate Embeddedness	M	M	M	M	No change from FA; cross-country motor vehicle use accelerates erosion over time.
Stream bank Condition	M	M	M	M	No change from FUR; roads and trails continue with existing effects.
Boulder Creek					
Substrate Embeddedness	D	M	D	D	No temporary change from FR; cross-country motor vehicle use accelerates erosion over time.
Stream bank Condition	M	M	M	M	No change from FUR; roads and trails continue with existing effects.
Middle Salmon-Indian Creek, California Creek, Middle Salmon-Bear Creek, Middle Salmon-Carey Creek					
Substrate Embeddedness	D	M	D	D	No temporary change from FR; cross-country motor vehicle use accelerates erosion over time.
Stream bank Condition	M	M	M	M	No change from FUR; roads and trails continue with existing effects.
Upper Warren Creek, Middle Warren Creek, Lower Warren Creek					
Substrate Embeddedness	D	M	D	D	No temporary change from FR; cross-country motor vehicle use accelerates erosion over time.

Table F-3. Effects of Alternative A on the Fish Habitat Indicators in Affected Watersheds or Combinations of Watersheds Based on Whether Conditions Would Be Improved (I), Maintained (M), or Degraded (D)

Pathways & Indicators	Effects of Alternative A				
	Overall Effect	Expected Trend			Discussion of Effects
		Temporary	Short-term	Long-term	
Stream bank Condition	M	M	M	M	No change from FUR; roads and trails continue with existing effects.
Little French Creek & Lower French Creek					
Substrate Embeddedness	D	M	D	D	No temporary change from FUR; cross-country motor vehicle use accelerates erosion over time.
Stream bank Condition	M	M	M	M	No change from FUR; roads and trails continue with existing effects
Elkhorn Creek					
Substrate Embeddedness	D	M	D	D	No temporary change from FR; cross-country motor vehicle use accelerates erosion over time.
Stream bank Condition	M	M	M	M	No change from FUR; roads and trails continue with existing effects.
Partridge Creek					
Substrate Embeddedness	M	M	M	M	No change from FA
Stream bank Condition	M	M	M	M	No change from FR; roads and trails continue with existing effects.
Lake Creek					
Substrate Embeddedness	M	M	M	M	No change from FA; cross-country motor vehicle use accelerates erosion over time.
Stream bank Condition	M	M	M	M	No change from FR; roads and trails continue with existing effects.
South Fork Salmon River-Goat Creek, Blackmare Creek, South Fork Salmon River-Fourmile Creek, South Fork Salmon River-Camp Creek, Buckhorn Creek					
Substrate Embeddedness	D	M	D	D	No temporary change from FUR; cross-country motor vehicle use accelerates erosion over time.
Stream bank Condition	M	M	M	M	No change from FUR; roads and trails continue with existing effects.

Table F-3. Effects of Alternative A on the Fish Habitat Indicators in Affected Watersheds or Combinations of Watersheds Based on Whether Conditions Would Be Improved (I), Maintained (M), or Degraded (D)

Pathways & Indicators	Effects of Alternative A				
	Overall Effect	Expected Trend			Discussion of Effects
		Temporary	Short-term	Long-term	
East Fork South Fork Salmon River-Loosum Creek, Lower East Fork South Fork Salmon River					
Substrate Embeddedness	D	M	D	D	No temporary change from FR; cross-country motor vehicle use accelerates erosion over time.
Stream bank Condition	M	M	M	M	No change from FUR; roads and trails continue with existing effects.
Upper Secesh River, Secesh River-Summit Creek, Secesh River-Victor Creek, Secesh River-Zena Creek					
Substrate Embeddedness	D	M	D	D	No temporary change from FA; cross-country motor vehicle use accelerates erosion over time.
Stream bank Condition	M	M	M	M	No change from FUR; roads and trails continue with existing effects.
South Fork Salmon River-Rock Creek, Sheep Creek, Bear Creek, Pony Creek, South Fork Salmon-Grouse Creek, & Lower South Fork Salmon River					
Substrate Embeddedness	D	M	D	D	No temporary change from FUR; cross-country motor vehicle use accelerates erosion over time.
Stream bank Condition	M	M	M	M	No change from FUR; roads and trails continue with existing effects.
Partridge Creek					
Substrate Embeddedness	M	M	M	M	No change from FA
Stream bank condition	M	M	M	M	No change from FUR roads and trails continue with existing effects.

Alternative B – Proposed Action

Substrate Embeddedness

Under Alternative B, the condition of substrate embeddedness in some watersheds is expected to degrade in the short and long term, but the rates would be lower than by making no change, hence Alternative B would benefit listed fish (Table F-4). The reduced rate would be due to the large areas closed to cross-country motor vehicle use. Some continued degradation is expected due to increased erosion over time from motorized use on designated roads and trails and the motorized travel allowed for dispersed camping and parking within 300 feet of designated roads and 100 feet of motorized trails. The increased erosion is expected to result in increased substrate

embeddedness in fish habitat. The existing condition would be maintained temporarily in the preceding watersheds, because the time period is too short to realize the increased effects of increasing traffic. Substrate embeddedness within the Upper Big Creek, Partridge Creek, and Lake Creek watersheds would be maintained.

The watersheds with reduced rates of degradation and long-term benefits to fish are Deep Creek, Indian Creek, and the Wildhorse River, tributaries to the Weiser River basin, tributaries to the Little Salmon River basin, tributaries to the Salmon River between the Little Salmon River and the South Fork Salmon River, and the South Fork Salmon River except Partridge and Lake Creeks, tributaries in the Secesh River and downriver from there (Table F-4).

Under Alternative B, the condition of substrate embeddedness in some watersheds is expected to improve because motorized vehicles would be limited to designated roads and trails and parking areas. No indiscriminate motorized travel would be allowed in a 300-foot area off designated roads and 100 feet off designated trails. The watersheds that would improve are tributaries to the South Fork Salmon River basin in the East Fork South Fork Salmon River and upstream in the South Fork Salmon River (Table F-4).

For all watersheds, Alternative B is consistent with Forest Plan direction with respect to substrate embeddedness in fish habitat to avoid degradation of WCIs, unless there is demonstrable long term benefit.

Stream Bank Conditions

Under Alternative B, stream bank conditions are expected to be maintained in many watersheds because there is no change in the number or type of stream crossings. No change in crossings would occur in Deep Creek, Indian Creek, tributaries to the Weiser River basin, tributaries to the Little Salmon River basin (except Rapid River, Hazard Creek, and Hard Creek), tributaries to the Salmon River between the Little Salmon River and the South Fork Salmon River, the South Fork Salmon River tributaries in the Secesh River and downriver from there, and Upper Big Creek.

Stream bank conditions are expected to be maintained in the Secesh River tributaries because the slight increase in stream crossings by motorized trails is expected to have only negligible effects. The rate of degradation is expected to be negligible compared to Alternative A because stream crossings on new designated routes would be improved as required by project design features (see Chapter 2). Most of these new routes occur in areas currently open to cross-country motor vehicle travel, hence the roadbeds and/or routes are being used. In addition, routes not designated for use could be proposed for decommissioning under future analysis, with potential long-term benefits.

The indicator is improved in the following watersheds due to decreases in motorized use on trails: Bear Creek, Little Salmon River – Elk Creek, Middle Salmon River – Indian Creek, Warren Creek, French Creek, Partridge, Lake Creek, South Fork Salmon River – Goat Creek, East Fork South Fork Salmon River, and the South Fork Salmon River – Rock Creek.

Alternative B is consistent with Forest Plan direction with respect to stream bank condition in fish habitat to avoid degradation of Watershed Condition Indicators (WCIs). Other areas are maintained or improved, so Alternative B is consistent with the Forest Plan (Table F-4).

Table F-4. Effects of Alternative B on the Fish Habitat Indicators

In affected watersheds or combinations of watersheds based on whether conditions would be improved (I), maintained (M), or degraded (D). Change negligibly different than the No Action Alternative = (A*), rate of change lower than other alternatives = (<A, <B, <C). "Change" represents approximate change from Alternative A in acres open to motorized use (for Substrate Embeddedness) or miles of roads and trails (for Stream Bank Condition)

Pathways & Indicators	Effects of Alternative B				
	Effects	Expected Trend			Change
		Temporary	Short-term	Long-term	
Deep Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 95
Stream bank Condition	M	M	M	M	No change
Indian Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 7,897
Stream bank Condition	M	M	M	M	No change
Bear Creek and Crooked River					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decreases by 19,372
Stream bank Condition	I	I	I	I	Decrease by 1.6 miles
East Fork Weiser River					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 15,916
Stream bank Condition	M	M	M	M	No change
Upper Hornet Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 15,916
Stream bank Condition	M	M (A*)	M (A*)	M (A*)	No change
Upper Little Weiser River and Anderson Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 21,982
Stream bank Condition	M	M (A*)	M (A*)	M (A*)	Decrease by 0.9 miles
Mud Cr., Big Cr., Little Salmon River-Lower Goose Creek, Upper Goose Cr., Little Salmon River-Sixmile Cr., Little Salmon River-Lower Meadows Valley, Little Salmon River-Round Valley Cr.					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 30,974
Stream bank Condition	M	M	M	M	No change
Hard Creek & Hazard Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 1,506
Stream bank Condition	I	I	I	I	Decrease by 10 miles
Little Salmon River-Elk Creek					
Substrate Embeddedness	M	M	M	M	Open acres decrease by 3,095

Table F-4. Effects of Alternative B on the Fish Habitat Indicators

In affected watersheds or combinations of watersheds based on whether conditions would be improved (I), maintained (M), or degraded (D). Change negligibly different than the No Action Alternative = (A*), rate of change lower than other alternatives = (<A, <B, <C). "Change" represents approximate change from Alternative A in acres open to motorized use (for Substrate Embeddedness) or miles of roads and trails (for Stream Bank Condition)

Pathways & Indicators	Effects of Alternative B				
	Effects	Expected Trend			Change
		Temporary	Short-term	Long-term	
Stream bank Condition	I	I	I	I	Decrease by 5.1 miles
Upper Rapid River					
Substrate Embeddedness	M	M	M	M	Open acres decrease by 1,722
Stream bank Condition	I	I	I	I	Decrease by 7.1 miles
Boulder Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 11,131
Stream bank Condition	M	M (A*)	M (A*)	M (A*)	Decrease by 0.1 miles
Middle Salmon-Indian Creek, California Creek, Middle Salmon-Bear Cr., Middle Salmon-Carey Cr.					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 16,150
Stream bank Condition	I	I	I	I	Decrease by 3.5 miles
Upper Warren Creek, Middle Warren Creek, Lower Warren Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 23,084
Stream bank Condition	I	I	I	I	Decrease by 2.8 miles
Little French Creek, Lower French Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 2,832
Stream bank Condition	I	I	I	I	Decrease by 11.8 miles
Elkhorn Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 157
Stream bank Condition	M	M (A*)	M (A*)	M (A*)	Decrease by 0.7 miles
Partridge Creek					
Substrate Embeddedness	M	M	M	M	Open acres decrease by 124
Stream bank Condition	I	I	I	I	Decrease by 5.3 miles
Lake Creek					
Substrate Embeddedness	M	M	M	M	Open acres decrease by 143
Stream bank Condition	I	I	I	I	Decrease by 6.3 miles
South Fork Salmon River-Goat Creek, Blackmare Creek, South Fork Salmon River-Fourmile Creek, South Fork Salmon River-Camp Creek, & Buckhorn Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 727

Table F-4. Effects of Alternative B on the Fish Habitat Indicators

In affected watersheds or combinations of watersheds based on whether conditions would be improved (I), maintained (M), or degraded (D). Change negligibly different than the No Action Alternative = (A*), rate of change lower than other alternatives = (<A, <B, <C). "Change" represents approximate change from Alternative A in acres open to motorized use (for Substrate Embeddedness) or miles of roads and trails (for Stream Bank Condition)

Pathways & Indicators	Effects of Alternative B				
	Effects	Expected Trend			Change
		Temporary	Short-term	Long-term	
Stream bank Condition	I	I	I	I	Decrease by 31.5 miles
East Fork South Fork Salmon River-Loosum Creek, Lower East Fork South Fork Salmon River					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 340
Stream bank Condition	I	I	I	I	Decrease by 15 miles
Upper Secesh River, Secesh River-Summit Creek, Secesh River-Victor Creek, Secesh River-Zena Cr.					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 19,981
Stream bank Condition	M	M (A*)	M (A*)	M (A*)	Increase by 5.8 miles in areas open to cross-country motor vehicle use. Opportunities increase and PDF are applied.
South Fork Salmon River-Rock Creek, Sheep Creek, Bear Creek, Pony Creek, South Fork Salmon-Grouse Creek, Lower South Fork Salmon River					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 2,229. Affected by upstream improvements.
Stream bank Condition	I	I	I	I	Decrease by 10.1 miles
Upper Big Creek					
Substrate Embeddedness	M	M	M	M	Acreage open to camping adjacent to roads and trails decreases on the Krassel District
Stream bank condition	M	M	M	M	No change

Alternative C

Substrate Embeddedness

Under Alternative C, the condition of substrate embeddedness in some watersheds is expected to degrade in the short and long term at the same rate as Alternative A due to increased erosion from motorized use, especially in areas open to cross-country motor vehicle travel.

The condition of substrate embeddedness in some watersheds is expected to degrade in the short and long term, but the rates would be lower than by making no change, hence Alternative C would benefit listed fish in these watersheds (Table F-5). These watersheds include: Deep Creek, tributaries to the Brownlee Reservoir, tributaries to the Weiser River basin, tributaries to the Little Salmon River basin, tributaries to the Salmon River between the Little Salmon River and the South Fork Salmon River (except Partridge and Lake Creeks), and South Fork Salmon River tributaries in the Secesh River and downriver from there.

Alternative C is not consistent with Forest Plan direction to avoid degradation of the Watershed Condition Indicator (WCI) of substrate embeddedness, unless there is demonstrable long term benefit, in the South Fork Salmon River – Goat Creek, and the East Fork South Fork Salmon River watersheds. Increased erosion is expected to in increase substrate embeddedness in fish habitat resulting in degradation of the WCI. Temporarily, the existing condition would be maintained in the watersheds listed above, because the temporary time period is too short to realize the degrading effects of increasing traffic.

Alternative C is consistent with Forest Plan direction for the indicator of substrate embeddedness in Upper Big Creek (Middle Fork Salmon River tributary), Partridge Creek, and Lake Creek (Main Salmon River tributaries) watersheds, because conditions in these watersheds are maintained.

Stream Bank Conditions

Under Alternative C, stream bank conditions are expected to be maintained in some watersheds because there is no change in the number or type of stream crossings. No change in crossings would occur in the Deep Creek, Indian Creek, Bear Creek and Crooked River, tributaries to the Weiser River basin, tributaries to the Little Salmon River basin, tributaries to the Salmon River between the Little Salmon River and the South Fork Salmon River (except tributaries to Warren Creek, French Creek, and Middle Salmon River – Indian Creek), and the South Fork Salmon River tributaries in the East Fork South Fork Salmon River.

Stream bank conditions are expected to be improved in some watersheds due to a decreased number of stream crossings. Tributaries to Warren Creek, French Creek, and Middle Salmon River – Indian Creek are expected to improve with decreased numbers of stream crossings.

Stream bank conditions are expected to be maintained in the Secesh River tributaries because the slight increase in stream crossings by motorized trails is expected to have only negligible effects. The rate of degradation is expected to be negligible compared to Alternative A because stream crossings on new designated routes would be improved as required by project design features (see Chapter 2). Most of these new routes occur in areas open to cross-country motor vehicle travel, hence the roadbeds and/or routes are currently being used. In addition, routes not designated for use could be proposed for decommissioning under future analysis, with potential long-term benefits.

Stream bank conditions in the tributaries to the South Fork Salmon River (except those in the Secesh River and East Fork South Fork Salmon River) are expected to degrade because of the increase in stream crossings by motorized trails. The new motorized routes would occur in areas

currently closed to cross-country motor vehicle use. The Forest Plan requires associated activities to provide long-term benefits (SWST04). While roads and trails could be identified for decommissioning, the decision to do so is beyond the scope of this analysis.

Alternative C is consistent with Forest Plan direction with respect to stream bank condition in fish habitat to avoid degradation of Watershed Condition Indicators (WCIs), in all watersheds except for the tributaries to the South Fork Salmon River (excluding those in the Secesh River and East Fork South Fork Salmon River). Other areas are maintained or improved. However, the tributaries to the South Fork Salmon River (except those in the East Fork South Fork Salmon River) could be consistent with Forest Plan direction in the future as opportunities to rehabilitate closed roads are implemented (Table F-5).

Table F-5. Effects of Alternative C on the Fish Habitat Indicators

In affected watersheds or combinations of watersheds based on whether conditions would be improved (I), maintained (M), or degraded (D). Change negligibly different than the No Action Alternative = (A*), rate of change lower than other alternatives = (<A, <B, <D). "Change" represents approximate change from Alternative A in acres open to motorized use (for Substrate Embeddedness) or miles of roads and trails (for Stream Bank Condition)

Pathways & Indicators	Effects of Alternative C				
	Effects	Expected Trend			Change
		Temporary	Short-term	Long-term	
Deep Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 95
Stream bank Condition	M	M	M	M	No change
Indian Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 7,882
Stream bank Condition	M	M	M	M	Decrease by 0.7 miles
Bear Creek and Crooked River					
Substrate Embeddedness	D (<A)	D (<A)	D (<A)	D (<A)	Open acres decrease by 19,268
Stream bank Condition	M	M	M	M	Increases 2.0 miles in an area now open to motorized use. Opportunities increase and PDF are applied.
East Fork Weiser River					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 15,905
Stream bank Condition	M	M (A*)	M (A*)	M (A*)	Increase by 0.4 miles
Upper Hornet Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 2,281
Stream bank Condition	M	M	M	M	No change
Upper Little Weiser River & Anderson Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 21,824
Stream bank Condition	M	M (A*)	M (A*)	M (A*)	Increases 5.9 miles in an area now open to motorized use. Opportunities increase and PDF are applied.

Table F-5. Effects of Alternative C on the Fish Habitat Indicators

In affected watersheds or combinations of watersheds based on whether conditions would be improved (I), maintained (M), or degraded (D). Change negligibly different than the No Action Alternative = (A*), rate of change lower than other alternatives = (<A, <B, <D). "Change" represents approximate change from Alternative A in acres open to motorized use (for Substrate Embeddedness) or miles of roads and trails (for Stream Bank Condition)

Pathways & Indicators	Effects of Alternative C				
	Effects	Expected Trend			Change
		Temporary	Short-term	Long-term	
Mud Creek, Big Cr., Little Salmon River-Lower Goose Cr., Upper Goose Creek, Little Salmon River -Sixmile Cr., Little Salmon River-Lower Meadows Valley, Little Salmon River-Round Valley Cr.					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease from 40,970 to 9,720
Stream bank Condition	M	M	M	M	No change
Hard Creek & Hazard Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 14,812
Stream bank Condition	M (A*)	M (A*)	M (A*)	M (A*)	Increase by 0.4 miles
Little Salmon River-Elk Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 2,972
Stream bank Condition	M	M	M	M	No change
Upper Rapid River					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 1,552
Stream bank Condition	M	M	M	M	No change
Boulder Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 11,128
Stream bank Condition	M	M	M	M	No change
Middle Salmon-Indian Cr., California Cr., Middle Salmon-Bear Cr., & Middle Salmon-Carey Cr.					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 16,444
Stream bank Condition	I	I	I	I	Decrease by 3.5 miles
Upper Warren Creek, Middle Warren Creek, & Lower Warren Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 23,084
Stream bank Condition	I	I	I	I	Decrease by 2.8 miles
Little French Creek, & Lower French Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 2,617
Stream bank Condition	I	I	I	I	Decrease by 2.8 miles
Elkhorn Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 144
Stream bank Condition	M	M	M	M	No change

Table F-5. Effects of Alternative C on the Fish Habitat Indicators

In affected watersheds or combinations of watersheds based on whether conditions would be improved (I), maintained (M), or degraded (D). Change negligibly different than the No Action Alternative = (A*), rate of change lower than other alternatives = (<A, <B, <D). "Change" represents approximate change from Alternative A in acres open to motorized use (for Substrate Embeddedness) or miles of roads and trails (for Stream Bank Condition)

Pathways & Indicators	Effects of Alternative C				
	Effects	Expected Trend			Change
		Temporary	Short-term	Long-term	
Partridge Creek					
Substrate Embeddedness	M	M	M	M	No change
Stream bank Condition	M	M	M	M	No change
Lake Creek					
Substrate Embeddedness	M	M	M	M	No change
Stream bank Condition	M	M	M	M	No change
South Fork Salmon River-Goat Creek, Blackmare Creek, South Fork Salmon River-Fourmile Creek, South Fork Salmon River-Camp Creek, Buckhorn Creek					
Substrate Embeddedness	D	M	D	D	Open acres increase by 98
Stream bank Condition	D	D	D	D	Increase by 4.3 miles in areas now closed to motorized use
East Fork South Fork Salmon River-Loosum Creek, & Lower East Fork South Fork Salmon River					
Substrate Embeddedness	D	M	D	D	Open acres increase by 13
Stream bank Condition	M (A*)	M (A*)	M (A*)	M (A*)	Increase by 0.3 miles
Upper Secesh River, Secesh River-Summit Creek, Secesh River-Victor Creek, Secesh River-Zena Cr.					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 19,981
Stream bank Condition	M (A*)	M (A*)	M (A*)	M (A*)	Increase by 5.8 miles in areas open to cross-country motor vehicle use. Opportunities increase and PDF are applied.
South Fork Salmon River-Rock Creek, Sheep Creek, Bear Creek, Pony Creek, South Fork Salmon-Grouse Creek, & Lower South Fork Salmon River					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 21,732
Stream bank Condition	D	D	D	D	Increase 8 miles in areas closed to motorized use.
Upper Big Creek					
Substrate Embeddedness	M	M	M	M	Acreage open to camping adjacent to roads and trails decreases on the Krassel District
Stream bank condition	M	M	M	M	No change

Alternative D

Substrate Embeddedness

The condition of substrate embeddedness in some watersheds is expected to degrade in the short and long term, but the rates would be lower than by making no change, hence Alternative D would benefit listed fish in the these watersheds (Table F-6). These watersheds include: Deep Creek, tributaries to the Brownlee Reservoir, tributaries to the Weiser River basin, tributaries to the Little Salmon River basin, tributaries to the Salmon River between the Little Salmon River and the South Fork Salmon River, and the South Fork Salmon River tributaries in the Secesh River and downriver from there.

The increased erosion is expected to result in increased substrate embeddedness in fish habitat. The existing condition would be maintained temporarily in the preceding watersheds, because the temporary time period is too short to realize the increased effects of increasing traffic

Under Alternative D, the condition of substrate embeddedness in some watersheds is expected to improve because motorized vehicles would be limited to designated roads, trails and parking areas. No motorized travel would be allowed off roads and trails except for camping in a 300-foot area off designated roads and 100 feet off designated trails. The watersheds that would improve include tributaries to the South Fork Salmon River basin in the East Fork South Fork Salmon River, and upstream from it in the South Fork Salmon River.

Alternative D is consistent with Forest Plan direction to avoid degradation of the WCIs of substrate embeddedness, unless there is demonstrable long-term benefit. This is the case in all watersheds except Upper Big Creek (Middle Fork Salmon River tributary) where the existing condition is maintained.

Stream Bank Conditions

Under Alternative D, stream bank conditions are expected to be improved or maintained in all watersheds because the number or type of stream crossings decreases or shows no change. No change in crossings would occur in Deep Creek, Indian Creek, tributaries to the Weiser River basin (except the Little Weiser River), and tributaries to the Little Salmon River basin (except Rapid River, Hard and Hazard Creeks, and Elk Creek). Stream bank conditions in the following watersheds would improve with decreased numbers of stream crossings: tributaries to Bear Creek and Crooked River, Little Weiser River, Rapid River, and Hard Creek, Hazard Creek, and Elk Creek (Little Salmon River tributaries), Warren Creek, Partridge Creek, Lake Creek, and the entire South Fork Salmon River basin.

Alternative D is consistent with Forest Plan direction with respect to stream bank condition in fish habitat to avoid degradation of WCIs, because all watersheds are maintained or improved (Table F-6).

Table F-6. Effects of Alternative D on the Fish Habitat Indicators

In affected watersheds or combinations of watersheds based on whether conditions would be improved (I), maintained (M), or degraded (D). Change negligibly different than the No Action Alternative = (A*), rate of change lower than other alternatives = (<A, <B, <D). "Change" represents approximate change from Alternative A in acres open to motorized use (for Substrate Embeddedness) or miles of roads and trails (for Stream Bank Condition)

Pathways & Indicators	Effects of Alternative D				
	Effects	Expected Trend			Change
		Temporary	Short-term	Long-term	
Deep Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 95
Stream bank Condition	M	M	M	M	No change
Indian Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 7,897
Stream bank Condition	M	M	M	M	No change
Bear Creek and Crooked River					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 19,372
Stream bank Condition	I	I	I	I	Decrease by 1.6 miles
East Fork Weiser River					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 15,916
Stream bank Condition	M	M	M	M	No change
Upper Hornet Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 2,281
Stream bank Condition	M	M	M	M	No change
Upper Little Weiser River & Anderson Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 22,082
Stream bank Condition	I	I	I	I	Decrease by 4.9 miles
Mud Creek, Big Cr., Little Salmon River-Lower Goose Cr., Upper Goose Cr., Little Salmon River-Sixmile Cr., Little Salmon River-Lower Meadows Valley, Little Salmon River-Round Valley Cr.					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 30,974
Stream bank Condition	M	M	M	M	No change
Hard Creek & Hazard Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 15,131
Stream bank Condition	I	I	I	I	Decrease by 12.9 miles
Little Salmon River-Elk Creek					

Table F-6. Effects of Alternative D on the Fish Habitat Indicators

In affected watersheds or combinations of watersheds based on whether conditions would be improved (I), maintained (M), or degraded (D). Change negligibly different than the No Action Alternative = (A*), rate of change lower than other alternatives = (<A, <B, <D). "Change" represents approximate change from Alternative A in acres open to motorized use (for Substrate Embeddedness) or miles of roads and trails (for Stream Bank Condition)

Pathways & Indicators	Effects of Alternative D				
	Effects	Expected Trend			Change
		Temporary	Short-term	Long-term	
Substrate Embeddedness	M	M	M	M	Open acres decrease by 3,106
Stream bank Condition	I	I	I	I	Decrease by 5.6 miles
Upper Rapid River					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 1,722
Stream bank Condition	I	I	I	I	Decrease by 7.1 miles
Boulder Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 11,131
Stream bank Condition	M	M (A*)	M (A*)	M (A*)	Decrease 0.1 miles
Middle Salmon-Indian Creek, California Creek, Middle Salmon-Bear Creek, & Middle Salmon-Carey Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 16,604
Stream bank Condition	I	I	I	I	Decrease by 9.9 miles
Upper Warren Creek, Middle Warren Creek, & Lower Warren Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 23,084
Stream bank Condition	I	I	I	I	Decrease by 2.8 miles
Little French Creek & Lower French Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 2,928
Stream bank Condition	I	I	I	I	Decrease by 15.8 miles
Elkhorn Creek					
Substrate Embeddedness	D (A*)	M	D (A*)	D (A*)	Open acres decrease by 195
Stream bank Condition	I	I	I	I	Decrease by 2.4 miles
Partridge Creek					
Substrate Embeddedness	M	M	M	M	Open acres decrease by 124
Stream bank Condition	I	I	I	I	Decrease by 5.3 miles
Lake Creek					
Substrate Embeddedness	M	M	M	M	Open acres decrease by 143

Table F-6. Effects of Alternative D on the Fish Habitat Indicators

In affected watersheds or combinations of watersheds based on whether conditions would be improved (I), maintained (M), or degraded (D). Change negligibly different than the No Action Alternative = (A*), rate of change lower than other alternatives = (<A, <B, <D). "Change" represents approximate change from Alternative A in acres open to motorized use (for Substrate Embeddedness) or miles of roads and trails (for Stream Bank Condition)

Pathways & Indicators	Effects of Alternative D				
	Effects	Expected Trend			Change
		Temporary	Short-term	Long-term	
Stream bank Condition	I	I	I	I	Decrease by 6.3 miles
South Fork Salmon River-Goat Creek, Blackmare Creek, South Fork Salmon River-Fourmile Creek, South Fork Salmon River-Camp Creek, & Buckhorn Creek					
Substrate Embeddedness	I	M	I	I	Open acres decrease by 727
Stream bank Condition	I	I	I	I	Decrease by 31.5 miles
East Fork South Fork Salmon River-Loosum Creek, Lower East Fork South Fork Salmon River					
Substrate Embeddedness	I	M	I	I	Open acres decrease by 340
Stream bank Condition	I	I	I	I	Decrease by 15 miles
Upper Secesh River, Secesh River-Summit Creek, Secesh River-Victor Cr., & Secesh River-Zena Cr.					
Substrate Embeddedness	M (A*)	M	M (A*)	M (A*)	Open acres decrease by 20,296
Stream bank Condition	I	I	I	I	Decrease by 7.6 miles
South Fork Salmon River-Rock Creek, Sheep Creek, Bear Creek, Pony Creek, South Fork Salmon-Grouse Creek, & Lower South Fork Salmon River					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 22,353. Affected by upstream improvements.
Stream bank Condition	I	I	I	I	Decrease by 12.7 miles
Lake Creek					
Substrate Embeddedness	M	M	M	M	Acreage open to camping adjacent to roads and trails decreases on the Krassel District
Stream bank condition	M	M	M	M	No change

Alternative E

Substrate Embeddedness

Under Alternative E, the condition of substrate embeddedness in some watersheds is expected to degrade in the short and long term, but the rates would be lower than by making no change, hence Alternative E would benefit listed fish (Table F-7). The reduced rate would be due to the large areas closed to cross-country motor vehicle use. Some continued degradation is expected due to increased erosion over time from motorized use on designated roads and trails and the motorized travel allowed for parking and dispersed camping within 300 feet of designated roads and 100 feet of motorized trails. The increased erosion is expected to result in increased substrate embeddedness in fish habitat. The watersheds that would degrade at reduced rates with long-term

benefits to fish are Deep Creek, tributaries to the Weiser River basin, tributaries to the Little Salmon River basin, tributaries to the Salmon River between the Little Salmon River and the South Fork Salmon River, and the South Fork Salmon River tributaries in the Secesh River and downriver from there (Table F-7).

Under Alternative E, the condition of substrate embeddedness in some watersheds is expected to improve because motorized vehicles would be limited to designated roads and trails and parking areas. No indiscriminate motorized travel would be allowed in a 300-foot area off designated roads and 100 feet off designated trails. The watersheds that would improve are tributaries to the South Fork Salmon River basin in the East Fork South Fork Salmon River (Table F-7). Upper Big Creek is maintained.

For all watersheds, Alternative E is consistent with Forest Plan direction with respect to substrate embeddedness in fish habitat to avoid degradation of WCIs, unless there is demonstrable long term benefit.

Stream Bank Conditions

Under Alternative E, stream bank conditions are expected to be maintained in many watersheds because there is no change in the number or type of stream crossings. No change in crossings would occur in the Deep Creek, Indian Creek, Bear Creek, Crooked River, tributaries to the Weiser River basin, tributaries to the Little Salmon River basin in Mud Creek… and Little Salmon- Elk Creek and Boulder Creek, Elkhorn, Partridge and Lake Creek (Salmon River tributaries) and in the Secesh River and downriver from there in the South Fork Salmon River - Rock Creek.

Stream bank conditions are expected to be maintained in the Secesh River tributaries because the slight increase in stream crossings by motorized trails is expected to have only negligible effects. The rate of degradation is expected to be negligible compared to Alternative A because stream crossings on new designated routes would be improved as required by project design features (see Chapter 2). Most of these new routes occur in areas open to cross-country motor vehicle, hence the roadbeds and/or routes are currently being used. In addition, routes not designated for use could be proposed for decommissioning under future analysis, with potential long-term benefits.

Improvement would occur in Hard Creek and Hazard Creek, Rapid River, Middle Salmon River – Indian, Warren Creek, French Creek, South Fork Salmon River – Goat Creek, and East Fork South Fork Salmon River because of reduced trail mileage open to motorized use.

Alternative E is consistent with Forest Plan direction with respect to stream bank condition in fish habitat to avoid degradation of WCIs. Other areas are maintained or improved, so Alternative E is consistent with the Forest Plan (Table F-7).

Table F-7. Effects of Alternative E on the Fish Habitat Indicators

In affected watersheds or combinations of watersheds based on whether conditions would be improved (I), maintained (M), or degraded (D). Change negligibly different than the No Action Alternative = (A*), rate of change lower than other alternatives = (<A, <B, <C). "Change" represents approximate change from Alternative A in acres open to motorized use (for Substrate Embeddedness) or miles of roads and trails (for Stream Bank Condition)

Pathways & Indicators	Effects of Alternative E				
	Effects	Expected Trend			Change
		Temporary	Short-term	Long-term	
Deep Creek					
Substrate Embeddedness	D(<A)	M	D(<A)	D(<A)	Open acres decrease by 95

Table F-7. Effects of Alternative E on the Fish Habitat Indicators

In affected watersheds or combinations of watersheds based on whether conditions would be improved (I), maintained (M), or degraded (D). Change negligibly different than the No Action Alternative = (A*), rate of change lower than other alternatives = (<A, <B, <C). "Change" represents approximate change from Alternative A in acres open to motorized use (for Substrate Embeddedness) or miles of roads and trails (for Stream Bank Condition)

Pathways & Indicators	Effects of Alternative E				
	Effects	Expected Trend			Change
		Temporary	Short-term	Long-term	
Stream bank Condition	M	M	M	M	No change
Indian Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 7,882
Stream bank Condition	M	M(A*)	M(A*)	M(A*)	Increase by 0.7 mi.
Bear Creek and Crooked River					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decreases by 19,169
Stream bank Condition	M	M(A*)	M(A*)	M(A*)	Increases 6.9 mi. in an area now open to motorized use. Opportunities increase and PDF are applied.
East Fork Weiser River					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 15,916
Stream bank Condition	M	M	M	M	No change
Upper Hornet Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 2,201
Stream bank Condition	M	M (A*)	M (A*)	M (A*)	No change
Upper Little Weiser River and Anderson Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 21,845
Stream bank Condition	M	M (A*)	M (A*)	M (A*)	Increases 5 mi. in an area now open to motorized use. Opportunities increase and PDF are applied.
Mud Cr., Big Cr., Little Salmon River-Lower Goose Creek, Upper Goose Cr., Little Salmon River-Sixmile Cr., Little Salmon River-Lower Meadows Valley, Little Salmon River-Round Valley Cr.					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 30,974
Stream bank Condition	M	M	M	M	No change
Hard Creek & Hazard Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 14,937
Stream bank Condition	I	I	I	I	Decrease by 4.8 mi.
Little Salmon River-Elk Creek					
Substrate Embeddedness	M	M	M	M	Open acres decrease by 2,972
Stream bank Condition	M	M	M	M	No change
Upper Rapid River					
Substrate Embeddedness	M	M	M	M	Open acres decrease by 1,602

Table F-7. Effects of Alternative E on the Fish Habitat Indicators

In affected watersheds or combinations of watersheds based on whether conditions would be improved (I), maintained (M), or degraded (D). Change negligibly different than the No Action Alternative = (A*), rate of change lower than other alternatives = (<A, <B, <C). "Change" represents approximate change from Alternative A in acres open to motorized use (for Substrate Embeddedness) or miles of roads and trails (for Stream Bank Condition)

Pathways & Indicators	Effects of Alternative E				
	Effects	Expected Trend			Change
		Temporary	Short-term	Long-term	
Stream bank Condition	I	I	I	I	Decrease by 2 mi.
Boulder Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 11,131
Stream bank Condition	M	M (A*)	M (A*)	M (A*)	Decrease by 0.1 mi.
Middle Salmon-Indian Creek, California Creek, Middle Salmon-Bear Cr., Middle Salmon-Carey Cr.					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 16,429
Stream bank Condition	I	I	I	I	Decrease by 2.9 mi.
Upper Warren Creek, Middle Warren Creek, Lower Warren Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 23,048
Stream bank Condition	I	I	I	I	Decrease by 1.4 mi.
Little French Creek, Lower French Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 2,684
Stream bank Condition	I	I	I	I	Decrease by 5.7 mi.
Elkhorn Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 157
Stream bank Condition	M	M (A*)	M (A*)	M (A*)	Decrease by 0.7 mi.
Partridge Creek					
Substrate Embeddedness	M	M	M	M	No change
Stream bank Condition	M	M	M	M	No change
Lake Creek					
Substrate Embeddedness	M	M	M	M	No change
Stream bank Condition	M	M	M	M	No change
South Fork Salmon River-Goat Creek, Blackmare Creek, South Fork Salmon River-Fourmile Creek, South Fork Salmon River-Camp Creek, & Buckhorn Creek					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 727
Stream bank Condition	I	I	I	I	Decrease by 15 mi.
East Fork South Fork Salmon River-Loosum Creek, Lower East Fork South Fork Salmon River					
Substrate Embeddedness	I	M	I	I	Open acres decrease by 340
Stream bank Condition	I	I	I	I	Decrease by 15 mi.
Upper Secesh River, Secesh River-Summit Creek, Secesh River-Victor Creek, Secesh River-Zena Cr.					

Table F-7. Effects of Alternative E on the Fish Habitat Indicators

In affected watersheds or combinations of watersheds based on whether conditions would be improved (I), maintained (M), or degraded (D). Change negligibly different than the No Action Alternative = (A*), rate of change lower than other alternatives = (<A, <B, <C). "Change" represents approximate change from Alternative A in acres open to motorized use (for Substrate Embeddedness) or miles of roads and trails (for Stream Bank Condition)

Pathways & Indicators	Effects of Alternative E				
	Effects	Expected Trend			Change
		Temporary	Short-term	Long-term	
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 20,022
Stream bank Condition	M	M (A*)	M (A*)	M (A*)	Increase by 3.7 mi. in areas open to cross-country motor vehicle use. Opportunities increase and PDF are applied.
South Fork Salmon River-Rock Creek, Sheep Creek, Bear Creek, Pony Creek, South Fork Salmon-Grouse Creek, Lower South Fork Salmon River					
Substrate Embeddedness	D (<A)	M	D (<A)	D (<A)	Open acres decrease by 21,949. Affected by upstream improvements.
Stream bank Condition	M	M	M	M	No change
Upper Big Creek					
Substrate Embeddedness	M	M	M	M	Acreage open to camping adjacent to roads and trails decreases on the Krassel District.
Stream bank Condition	M	M	M	M	No change

3.5.5 Cumulative Effects

Under all action alternatives, habitat for listed fishes is expected to trend toward Forest Plan objectives in the long term, because Forest Plan direction requires that management actions be implemented to benefit watershed conditions. These other actions could include road and trail maintenance and decommissioning and mine rehabilitation. The rate of change would be influenced by direct effects of changes in travel management as they incrementally interact with other portions of Forest Plan implementation. These other potential effects of Forest Plan implementation are not quantified in this analysis and are not a result of the travel plan.

Effects of Alternatives combined with effects of other past, ongoing, and reasonably foreseeable actions are expected to be as described for the independent effects of the action. A list of those other actions is available in Appendix D and the Project Record. For example, the Burgdorf Road Management Decision will result in activities that trend that area toward meeting the Forest Plan Aquatic Conservation Strategy (ACS) goals in all alternatives; whereas the Paddy Flat Vegetation Management Project would have no effect to listed and sensitive fish species. The Project Record contains Biological Assessments for all other ongoing federal actions that have combined effects to listed fishes in the river basins analyzed herein. Even though the issue evaluated in this text is for listed species, the definition of cumulative effects herein is that for NEPA and not the definition used under the ESA; the latter usage is reserved for Biological Assessments prepared under the ESA for the federal action that will be written based on this NEPA analysis. Implementation of the ACS would be piecemeal so that effects of other activities on substrate embeddedness and stream banks are extremely uncertain.

When Alternative A is combined with the effects of ground disturbing actions in the watersheds evaluated, and uncertainty about restoration actions is taken into account, it is the least likely to be consistent with Forest Plan implementation in the long run. Alternative C has a similar probability to Alternative A, while Alternatives B, D, and E have a higher probability to meet long-term Forest Plan objectives for fish habitat rehabilitation.

Irreversible and Irretrievable Commitments

Permanent facilities are not changed in any watershed containing TES or MIS species to an extent that loss of production occurs for an implemented action. With no changes in the transportation system (roads and trails) there are expected to be no irretrievable or irreversible changes to fish habitat, because permanent facilities are not changed. Irretrievable loss of fish production would only occur in a case where an action was implemented that caused permanent loss of some fish production. Avoidance of this would be insured through the consultation process with NMFS and FWS. Measures to avoid, minimize, or mitigate adverse effects to listed species will be developed through consultation and made a part of any implemented alternative.

Forest Plan Consistency

Forest Plan direction other than that described below is beyond the scope of this analysis (Fisheries Specialist Report: Project Record). Forest Plan consistency is represented by consistency with standards and guidelines. Specifically, SWST12 (Forest Plan 2003: III-23) applies for any construction related to redesign of roads or trails to accommodate changed traffic; however, those designs and this standard would be required during implementation. Applicable guideline SWGU01 (Forest Plan 2003: III-23) would be met for all alternatives by considering other agency and entity comments on this draft EIS. SWGU02 (Forest Plan 2003: III-23) is adhered to by completion of evaluation of the appropriate Watershed Condition Indicators (WCIs) as directed by Appendix B. SWGU11 (Forest Plan 2003: III-24) applies because transportation of hazardous materials must comply with 49 CFR 171 in all alternatives. SWGU13 (Forest Plan 2003: III-24) is complied with by identifying which watersheds containing TES fishes are affected. Standards for TES (Forest Plan 2003: III-11) from TEST01 through TEST06 apply and consultation with NMFS and FWS will occur for listed fishes before the Record of Decision (ROD) is approved. Likewise the travel plan will comply with guidelines TEGU01 through TEGU06 (Forest Plan 2003: III-14) by consulting with FWS and NMFS. TEGU14 does not apply because no changes in fish passage are within the scope of this action.

Management area direction was reviewed by the Ranger Districts' staffs and compliance with that direction was confirmed. In general, no new facilities would be constructed in MPCs that require restoration of TES fish habitat (such as 3.1 and 3.2), with the exception of the proposals in Alternative C in the South Fork Salmon River watersheds (see discussion below). Opportunities to rehabilitate roads and trails would still exist apart from this action.

Forest Plan standards SWST01, and SWST04 require analysis of Watershed Condition Indicators (WCIs) as defined in Appendix B and also require that indicators not be degraded without short or long-term benefits. To elaborate, these standards require that no management action will degrade or retard attainment of properly functioning conditions except where outweighed by demonstrable short or long term benefits, or where the Forest Service has limited authority. In the case of the Travel Plan, the Forest Service has discretion, so there must be long term benefits in order to comply with the Forest Plan. All action alternatives, with one exception (Alternative C), would reduce the rate of long-term degradation in a watershed when compared to No Action. This reduction in degradation rate is interpreted to be a benefit.

Based on the analysis of the effects to the two watershed condition indicators (substrate embeddedness and stream bank condition) a determination was made on whether the watershed condition would be maintained, degraded, or improved over time based on definitions provided in the Forest Plan, Appendix B. To maintain means that conditions stay within the range of FA where that condition occurs at present; in other cases (FU or FUR) a condition is not changed, or there is negligible change. To degrade means that an area that is FA declines in function to another category, or areas that are now at another functionality decline. To improve means that more than a negligible amount of functionality is increased.

Under all alternatives degradation of some watersheds would occur in the long term because of anticipated increases in motorized use on roads and trails over time. Alternatives that lessen the rate of long term degradation are beneficial compared to no change, and are therefore considered to be consistent with Forest Plan standards and guidelines.

Action alternatives B, D, and E are consistent with the Forest Plan because proposed activities (such as closure of areas to cross-country motor vehicle use) would reduce the anticipated rate of degradation compared to doing nothing.

Proposals in Alternative C would result in degradation of WCIs in some watersheds and therefore would not be consistent with the Forest Plan, Appendix B. This degradation would occur in areas currently closed to motorized travel that are proposed for new motorized uses – the South Fork Salmon River – Goat Creek, and East Fork South Fork Salmon River. The new motorized use is expected to cause degradation without "demonstrable short or long-term benefits" (SWST04). Such benefits could be shown by decommissioning of other roads and trails in these watersheds, but those activities were determined to be outside the scope of the Travel Plan analysis.

Opportunities to rehabilitate roads and trails would still exist apart from this action. If there is degradation and presently no long-term benefit in a watershed, then mitigation might include road decommissioning and other measures that are beyond the scope of this analysis. All action alternatives provide numerous opportunities to meet long-term Forest Plan fish habitat objectives by designating closed roads and trails that could be rehabilitated by future actions.

Project Record

The *Fisheries Specialist Report* in the Project Record is incorporated into this EIS (40 CFR 1502.21). The fisheries specialist relied on the detailed data, methodologies, analyses, conclusions, maps, references, and technical documentation in the *Fisheries Specialist Report* to make the conclusions presented in this EIS.

3.6 Wildlife and Wildlife Habitat

3.6.1 Scope of the Analysis

Public comment, Forest Plan direction, and law and regulation shaped the scope of the wildlife analysis. This analysis describes the effects of differing systems of motorized and non-motorized roads, trails, areas, and over-snow use on wildlife species of concern.

Wildlife species of concern are identified by the PNF Forest Plan (2003). They include species listed or proposed for listing under the Endangered Species Act (ESA) and those on the Regional Forester's Sensitive Species List. Other species or groups of species of concern include Management Indicator Species, migratory birds (due to the Migratory Bird Treaty Act and Executive Order), and elk (species of special interest).

Threatened and endangered species on the PNF include bald eagle, Canada lynx, gray wolf, and the northern Idaho ground squirrel (NIDGS). Wolves within the designated Central Idaho Wolf Recovery Area (CIWRA) were classified as threatened, nonessential experimental populations under the ESA (USDI 2000) until March 2003. Since then, the distinct population segment within Idaho was re-classified by the USFWS and the threatened status was dropped. The population is treated as a proposed species with effects evaluated based on jeopardy to the population. The southern Idaho ground squirrel (SIDGS) and yellow-billed cuckoo are candidate species. The SIDGS was recently added to the list of species that may occur on the Weiser Ranger District, but neither this species nor the yellow-billed cuckoo has ever been documented on the PNF.

Sensitive species known to occur on the Forest potentially affected by the proposed activities include Columbia spotted frog, boreal owl, flammulated owl, great gray owl, northern goshawk, three-toed woodpecker, Columbian sharp-tailed grouse, fisher, white-headed woodpecker, and wolverine. Candidate and sensitive species not known to occur on the Forest, have limited potential habitat or habitat that would not be affected by the Proposed Action or alternatives are addressed in the Wildlife Specialist Report (Project Record), but not included in the EIS. Management Indicator Species (MIS) are representative species whose habitat conditions or populations are used to assess the impacts of management activities on similar species in a particular area. Wildlife MIS for the PNF are the pileated woodpecker and white-headed woodpecker.

The Payette National Forest, outside of Wilderness, was considered to be the area of analysis for direct and indirect effects. The FC-RONR Wilderness was included in the analysis area for cumulative effects for lynx and wolverine. In addition, the status of source habitat from historical to current times within the Central Idaho Mountains Ecological Reporting Unit (ERU) was also disclosed for certain species. The disclosure provides a link to analyses of species and habitat status conducted at the larger scale of the Columbia River Basin. These larger scale analyses were conducted by a team of scientists in the late 1990s (Wisdom et al. 2000). The analyses looked at source habitat for ERUs. The Central Idaho Mountains ERU includes 90 percent of the Payette National Forest. The Blue Mountains ERU encompasses the remaining 10 percent of the Forest (Wisdom et al. 2000).

Public concerns related to wildlife were identified during the scoping process. The Wildlife Specialist's Report provides a list of the concerns and how these are addressed in the wildlife analysis. Substantial concerns became issues that drove the analysis of effects to wildlife. These are summarized below in the background discussion for the issues and indicators.

Issues and Indicators

Wildlife Issue 1: Motorized travel may affect summer and winter elk habitat and elk vulnerability during hunting season.

Indicators – Summer and Hunting Season:

- Acres open to cross-country motor vehicle use.
- Density (miles of road and motorized trail/square mile of area) of open NFS roads and motorized trails by watershed (5th hydrologic unit) in summer and fall.
- Percent of elk security habitat available during hunting season by Elk Analysis Area (EAA) on NFS land.

Indicators – Winter:

- Miles of groomed snowmobile routes within elk winter range.
- Acres and percent of elk winter range open to over-snow vehicle use.

Background:

The public expressed a variety of concerns related to elk including elk security and availability for elk for hunting and viewing. Some publics wanted more opportunities for motorized hunting and viewing access, while others asked for more closures to improve the hunting experience and elk habitat. The Forest Plan also directs the analysis of effects to elk (p. III-28: WIGU08).

Wildlife Issue 2: Motorized travel may affect Canada lynx habitat during summer and winter.

Indicators – Summer:

- Density of roads and motorized trails within lynx habitat.

Indicators – Winter:

- Acres open and closed to over-snow vehicle use in lynx habitat.
- Miles of groomed snowmobile routes within lynx habitat.
- Effects of over-snow vehicle use on habitat connectivity.

Background:

The lynx is listed as threatened under the ESA. The Lynx Conservation Assessment and Strategy (LCAS) provides a methodology for analyzing the effects of activities on Canada lynx habitat and populations (Ruediger et al. 2000). The PNF Forest Plan (2003) incorporates direction from and is consistent with the LCAS (see Table W-1). Some members of the public were concerned that lynx conservation measures are too restrictive, while others wanted all necessary conservation measures applied. See additional discussion under Wildlife Issue 5.

Wildlife Issue 3: Over-snow vehicle use may affect wolverine denning habitat.

Indicators:

- Percent of wolverine denning habitat closed to over-snow vehicle use.
- Effects of over-snow vehicle use on habitat connectivity.

Background:

The wolverine is a Forest Service Sensitive Species. The Forest Plan provides direction for wolverine conservation (see Table W-1). Some members of the public were concerned that measures to protect wolverine may be too restrictive, while others wanted all necessary conservation measures applied. The wolverine is a wide ranging species that may be particularly vulnerable to loss of habitat connectivity. See additional discussion under Wildlife Issue #5.

Wildlife Issue 4: Travel management may affect habitat and/or populations of the pileated woodpecker (PNF MIS for large tree and snag dependent species), the white-headed woodpecker (MIS and Sensitive Species), and the three-toed woodpecker (Sensitive Species).

Indicators:

- Changes in habitat and potential effects on individuals and populations.

Background:

The Forest Plan identified the pileated woodpecker and white-headed woodpecker as MIS that serve as indicators of the presence and condition of specific habitats or habitat conditions. On the PNF, the pileated woodpecker is the MIS for moderately dense mature forest habitats and the white-headed woodpecker is the MIS for mature ponderosa pine stands with low crown densities.

Wildlife Issue 5: Travel management may affect habitat and/or populations of threatened, endangered, and Forest Service Sensitive Species.

Indicators:

- Changes in habitat and potential effects on individuals and populations.

Background:

The Endangered Species Act of 1973 requires Federal agencies to review any project authorized, funded, or carried out to determine that the action is not likely to jeopardize the continued existence of any proposed, threatened, or endangered species. This review and determination is provided in the EIS and in a Biological Assessment (BA) (see Project Record).

During consultation with USFWS on the Biological Assessment for the FEIS, concerns were raised about the impact of roads and motorized trails on the northern Idaho ground squirrel. In response to those concerns, additional analysis was added to this FEIS and documented in the BA.

Forest Service direction on sensitive species is to follow conservation assessments and plans developed at the Regional or Forest level and to use a Biological Evaluation (BE) to assess activities for possible effects on sensitive species. The BE is summarized in this EIS.

Wildlife Issue 6: Travel management may affect migratory bird species.

Indicators:

- Changes in habitat and potential effects on individuals and populations

Background:

In January 2001, Executive Order 13186 was signed outlining responsibilities of federal agencies to protect migratory birds under the Migratory Bird Treaty Act (MBTA). As a complimentary measure to the Executive Order, the Forest Service and the U.S. Fish and Wildlife Service entered into a Memorandum of Understanding (MOU) to strengthen migratory bird conservation through enhanced collaboration between the agencies, in coordination with state, tribal, and local governments. Under the Migratory Bird Treaty Act, taking, killing, or possessing migratory birds, including nests and eggs, is unlawful.

3.6.2 Changes between Draft and Final EIS

Additional concerns were expressed in response to the release of the DEIS. Reponses to those concerns are included in Appendix F. Comments on the DEIS led to a new alternative (E). Comments on the range of alternatives lead to an increase in the amount of area open to motorized use in Alternative C to address concerns expressed by ISSA and a decrease in the

amount of area open in Alternative D to address IDF&G comments on protection of wolverine denning habitat.

Changes between draft and final relevant to the wildlife analysis include:

- Revised discussion and recent information were included on the effects of roads, trails, and various forms of travel on wildlife species.
- Additional discussion was provided on the effects of motorized recreation activities and hunting on elk.
- Idaho Fish and Game (IDF&G) expressed concern that the areas of wolverine denning habitat being protected in Alternative D are not the highest priority. Following a meeting with IDF&G, an additional closure area (Bruin Mountain) was included in Alternative D. The wildlife analysis discusses the benefits of this additional closure.
- IDF&G noted that some roads identified as open in the No Action Alternative (Alternative A) had in fact been closed to protect elk security during previous environmental analyses. Those roads were corrected.
- The analysis of the effects of the Travel Plan on lynx, including groomed snowmobile trails, used the most recent information available and described where this information may differ from current Forest Plan direction.
- During consultation with USFWS on the Biological Assessment for the FEIS, concerns were raised about the impact of roads and motorized trails on the northern Idaho ground squirrel. In response to those concerns, additional analysis was added to this FEIS and documented in the BA.
- The effects of the actions on the southern Idaho ground squirrel were evaluated and disclosed in the BA and project record. This candidate species was recently added to the list of species that may occur on the Weiser Ranger District, but no observations of SIDGS have occurred on the PNF.

Some areas open to over-snow motorized travel were revised in Alternative E. One focus of the revision was to follow discernable boundaries to improve public compliance with closures. Closures proposed in Alternative D were reassessed and modified to better follow topographic features. A summary of the changes between alternatives D and E follows:

- **Lava Butte area:** divided into two areas and renamed the **Patrick Butte area** on the west side and the **Bear Pete area** on the east side of the original closure. The **Patrick Butte area** was expanded to the south to encompass an additional site of modeled wolverine denning habitat, while the middle portion of the proposed Lava Butte closure area was deleted because it contained no modeled wolverine denning habitat. The boundaries were delineated based on modeled wolverine denning habitat (primarily in the Patrick Butte area), major ridgelines (such as the N-S line that extends along the west edge of Lava Butte), cirque basin landtypes and larger drainages.
- The **Bear Pete area** includes a substantial amount of modeled wolverine denning habitat in the E-W corridor between the FC-RONR Wilderness and Hell's Canyon. It also provides habitat along a western branch of the Needles to Marshall Mountain N-S corridor. The western boundary follows Trail 142. While the trail would not be discernable in winter, it appears to follow a natural break on the landscape.
- The **War Eagle/Marshal Mountain area** has been more accurately renamed the **Marshall Meadow area.** The western boundary follows the ridge above and to the southwest of Sand Creek across Willow Creek to the ridge NW of Willow Creek and then NE to the Forest

boundary (on the North) and then south down California Creek to end slightly north of Chimney Rock.

- **Big Creek area**: The southern boundary is the ridgeline divide between the McCall and Krassel ranger districts. The eastern boundary starts at Profile Peak, runs northwest down Big Creek past the town of Edwardsburg and the junction of Smith Creek and then up the hillside to end at a NE corner on McFadden Point. From here, the northern boundary is the FC-RONR Wilderness boundary (past Wolf Fang Peak) west to the SFSR. The western boundary is the SFSR back to the McCall-Krassel line.

3.6.3 Forest Plan Direction

The Payette National Forest Land and Resource Management Plan (2003) contains goals, objectives, standards, and guidelines for management of the wildlife. Forest Plan objectives form the basis for project-level actions to help achieve Forest goals. The time frame for achievement is generally the planning period (10 to 15 years) for the Forest Plan. Since this is also the planning period for the Travel Management Plan travel-related objectives in the Forest Plan are integral parts of the Travel Management Plan. Direction listed as a standard must be followed or a Forest Plan amendment may be necessary. Some management direction applies Forest-wide, while other direction is specific to individual management areas. Table W-1 includes Forest Plan management direction that has direct influence on travel management.

Table W-1: Forest Plan Direction for Wildlife Pertinent to the Travel Management Analysis.

Number	Direction	Page
TEOB12	During project planning, field review lynx analysis units (LAUs) that overlay project areas to determine the suitability for denning, foraging, security and connectivity of habitat within the project area.	III-9
TEOB14	During mid or project scale analysis, identify and prioritize opportunities for restoration of habitat linkage zones to promote genetic integrity and species distribution (see Figure E-1 in Appendix E of the Forest Plan).	III-9
TEOB28	During travel planning, identify areas of concentrated snow compaction activities (designated trails, snow play areas) in lynx habitat within LAUs, and minimize snow compaction in those areas to reduce potential conflicts.	III-10
TEOB30	Manage recreational activities to maintain lynx habitat and connectivity.	III-10
TEOB31	Concentrate activities within existing developed areas rather than developing new areas in lynx habitat.	III-11
TEST01	The Forest shall consult with the NMFS and Fish and Wildlife Service as needed, and appropriate, to comply with consultation requirements under the Endangered Species Act and Magnuson-Stevens Act	p. III-11
TEST02	For Forest-wide, watershed, or project-level Biological Opinions (BOs) and Biological Assessments (BAs) with letters of concurrence, requirements shall continue to apply until their expiration date unless these documents are specifically updated during further review with related regulatory agencies. Exception to this standard: The 1995 and 1998 Chinook and Steelhead Biological Opinions and 1998 Bull Trout Biological Opinion are replaced by the Biological Opinion for this Forest Plan revision…	p. III-11
TEST03	Design and implement projects to meet the terms of Forest Service approved portions of recovery plans. If a recovery plan does not yet exist, use the best information available (for example, BAs, BOs, letters of concurrence, Forest Service-approved portions of Conservation Strategies) until a recovery plan is written and approved.	p. III-11

Table W-1: Forest Plan Direction for Wildlife Pertinent to the Travel Management Analysis.

Number	Direction	Page
TEST04	Management actions that have adverse effects on Proposed or Candidate species or their habitats shall not be allowed if the effects of those actions would contribute to listing of the species as Threatened or Endangered under the ESA.	III-11
TEST06	Management actions shall be designed to avoid or minimize adverse effects to listed species and their habitats. For listed fish species, use Appendix B for determining compliance with this standard	p. III-14
TEST12	Mitigate, through avoidance or minimization, management actions within known nest or denning sites of TEPC species if those actions would disrupt reproductive success during the nesting or denning period. During project planning, determine sites, periods, and appropriate mitigation measures to avoid or minimize effects.	III-11
TEST34	Allow no net increase in groomed or designated over-the-snow routes or play areas, outside of baseline areas of consistent snow compaction, by LAU or in combination with immediately adjacent LAUs unless the Biological Assessment demonstrates the grooming or designation serves to consolidate use and improve lynx habitat…. Also, permits, authorizations or agreements could expand into baseline routes and baseline areas of existing snow compaction, and grooming could expand to routes of existing snow compaction and routes that have been designated but not groomed in the past and still comply with this standard.	III-14
TEGU01	Discretionary actions should avoid take of listed species, and actions where the Forest's discretion is limited should minimize adverse effects that could lead to a take	p. III-14
TEGU02	For proposed actions that may affect potential habitat of TEPC species, identify potential habitat and determine species presence within or near the project area. Document the rationale for not identifying potential habitat and determining species presence for TEPC species in the project record	p. III-14
TEGU03	Management actions in occupied Proposed or Candidate species habitat should be modified or relocated if the effects of the actions would contribute to a trend toward ESA listing for these species	p. III-14
WIGO06	Provide well-distributed habitat and connective corridors important to sustaining MIS and other wildlife species.	III-25
WIOB01	During fine-scale analyses, identify and prioritize opportunities for restoration of habitat linkage to promote genetic integrity and wildlife species distribution.	III-25
WIST02	Design and implement projects within occupied habitats of Sensitive species to help prevent them from becoming listed.....	III-27
WIST03	Mitigate management actions within known nesting or denning sites of MIS or Sensitive species if those actions would disrupt the reproductive success of those sites during the nesting or denning period. Sites, periods, and mitigation measures shall be determined during project planning.	III-27
WIST06	Mitigate human-caused disturbances within winter/spring ranges if disturbances cause displacement of wildlife while they are occupying those ranges.	III-27
WIGU06	Management actions in occupied Sensitive species habitat should be modified or relocated if the effects of the actions would contribute to a trend toward ESA listing for these species.	III-27
WIGU08	Big game vulnerability to road related mortality should be evaluated during project-level travel management planning to assess effects of potential travel management decisions on state population objectives.	III-28
WIGU13	To address big game vulnerability to mortality, components of habitat security should be identified and managed during project planning…..	III-28

Table W-1: Forest Plan Direction for Wildlife Pertinent to the Travel Management Analysis.

Number	Direction	Page
MA2 Obj 0246, MA3 Obj 0334	Coordinate with Idaho Department of Fish and Game to reduce bull elk vulnerability through the use of security areas and reductions in open road density to move toward State herd composition objectives.	III-115, III-132
MA2 St 0248, MA3 St 0339, MA5 St 0529	The northern Idaho ground squirrel will receive priority consideration for all management activities that occur within their known occupied habitat. The intent of this standard is not to exclude all other activities within this habitat, but rather to reduce or minimize potential impacts to this species while emphasizing habitat improvement within and adjacent to known sites.	III-116, III-132, III-161
MA6 Obj 0638	Reduce open road densities in the Goose Creek Watershed to reduce big-game vulnerability.	III-176

Management Area Direction

In addition to Forest-wide direction goals, objectives, standards and guidelines each Management Area (MA) on the Forest has direction designed to tier to Forest-wide direction, and to meet Forest-wide goals and desired conditions. However, MA direction is intended to be more specific and address particular concerns related to each program area. Specific MA direction pertinent to travel management planning and/or specific wildlife species is summarized in Appendix C.

3.6.4 Existing Condition

The Scope of the Analysis section above provides background information on the wildlife species and habitats selected for analysis. Table W-2 provides a summary of the wildlife species included in the analysis, the rationale for analysis, and a brief description of their habitats. Maps of known species locations are provided in the Project Record.

Existing Condition - Threatened, Endangered, Proposed, and Candidate Species

On December 1, 2006, the Boise Field Office of the Fish and Wildlife Service (FWS) provided the Payette National Forest an updated 90-day list of threatened, endangered, proposed, and candidate species. The listed species include the experimental/non-essential population of gray wolf (*Canis lupus*); the threatened species: Canada lynx (*Lynx canadensis*), northern Idaho ground squirrel (*Spermophilus brunneus brunneus*) and bald eagle (*Haliaeetus leucocephalus*). Two candidate species also occur on the list: the southern Idaho ground squirrel (for the Weiser Ranger District only) and the yellow-billed cuckoo. Candidate species not known to occur on the Forest, are addressed in the Wildlife Specialist Report (Project Record), but not included in the EIS. A Biological Assessment of the effects of the Travel Plan on listed, proposed, and candidate species has been prepared (see Wildlife Specialist Report: Project Record) and consultation with Fish and Wildlife Service is ongoing.

Table W-2. Wildlife Species Analyzed, the Rationale for Analysis, and a Brief Description of their Habitats.

Common Name *Latin Name*	Listed (T), Sensitive (S), MIS, or Special Interest	Rationale for Analysis	Preferred Habitat
Bald Eagle *Haliaeetus leucocephalus*	T	Habitat and individual birds occur on the PNF and may be impacted.	Normally nest and forage near large bodies of water. Winter visitors and yearlong residents of northern Idaho.
Gray Wolf *Canis lupus*	Experimental/Non-essential	Habitat and populations occur on the PNF and may be impacted.	Habitat generalist, usually prefer habitat away from human interactions
Canada Lynx *Felix lynx*	T	Suitable habitat is present. No known populations or individual lynx on the PNF, but habitat may be impacted.	Lodgepole pine habitat types, interspersed with subalpine fir, lodgepole pine, Engelmann spruce, moist Douglas-fir and moist grand fir habitat types.
Northern Idaho Ground Squirrel *Spermophilus brunneus brunneus*	T	Habitat and populations occur on the PNF and may be impacted.	Dry meadows & adjacent forest clearing with ponderosa pine & Douglas-fir forest typically between 4,000 & 5,000 feet elevation.
Columbia Spotted Frog *Rana luteiventris*	S	Habitat and population occur on the PNF and may be impacted.	Marshy edges of ponds or lakes or slow moving streams.
Boreal Owl *Aegolius funereus*	S	Habitat and populations occur on the PNF. Indirect impacts on snag habitat may occur.	High elevation spruce-fir, mixed conifer, and aspen forests generally above 6,000 feet.
Flammulated Owl *Otus flammeolus*	S	Habitat and populations occur on the PNF. Indirect impacts to snag habitat may occur.	Mature, old growth ponderosa pine, Douglas-fir forest.
Great Gray Owl *Strix nebulos*	S	Habitat and populations occur on the PNF and may be impacted.	Open grassy meadows or open forests with grass dominated understory.
Northern Goshawk *Accipiter gentilis*	S	Habitat and populations occur on the PNF and may be impacted.	Mature forests with relatively closed canopies. Mixed forest types.
Three-toed Woodpecker *Picoides tridactylus*	S	Habitat and populations occur on the PNF. Indirect impacts to snag habitat may occur.	Higher elevation spruce-fir and lodgepole forest.
White-headed Woodpecker *Picoides albolarvatus*	S/MIS	Habitat and populations occur on the PNF. Indirect impacts to snag habitat may occur.	Dry ponderosa pine/Douglas fir forests with mature trees.
Fisher *Martes pennant*	S	Habitat and populations occur on the PNF. Indirect impacts to snag habitat and down logs may occur.	Mesic forested habitats. Strong affinity for forested riparian habitats.
Wolverine *Gulo gulo*	S	Habitat and populations occur on the PNF. Habitat, especially denning habitat and connectivity may be impacted.	Far-ranging omnivorous habitat generalist. Isolation from human impacts and a diverse prey base important habitat components. Sparely timbered cirque basins provide denning habitat.

Table W-2. Wildlife Species Analyzed, the Rationale for Analysis, and a Brief Description of their Habitats.

Common Name *Latin Name*	Listed (T), Sensitive (S), MIS, or Special Interest	Rationale for Analysis	Preferred Habitat
Pileated Woodpecker *Dryocopus pileatus*	MIS	Habitat and populations occur on the PNF. Indirect impacts to snag habitat may occur.	Forests with tall, large-diameter dead or defective trees for nesting.
Elk *Cervis elaphus*	Special interest	Habitat and populations occur on the PNF. Winter and security habitat may be impacted.	Mosaic of habitat types that provide open parks for foraging and forested areas for thermal and security cover.
Migratory Birds	Special interest	Habitat and populations occur on the PNF and may be impacted.	Mosaic of habitat types.

Bald Eagle

The PNF is within The Pacific Bald Eagle Recovery Planning area, Central Idaho Zone 15 and Zone 14. Nesting, roosting, foraging, and winter use by eagles occurs on Forest, but there are only three known nest sites on the PNF. One nest located at Lost Valley Reservoir has been used for the last 10 years (Sallabanks 2006). Another nest site occurs along Hells Canyon Reservoir on the Snake River. Eagles have nested here successfully since 2003 (Carpenter and Holthuijzen 2006). A third nest was recently discovered on Upper Payette Lake, but no records of successful nesting have occurred. Wintering habitat for bald eagles on Forest is primarily located on the Snake River below the Wildhorse River confluence and along the Salmon River with occasional observations of bald eagles on the lower South Fork of the Salmon River.

Bald eagles make use of fish spawning runs where available. For example, bald eagles are annually observed perched in large cottonwood trees along the North Fork Payette River above Payette Lake. This occurs during the kokanee salmon runs upstream from Payette Lake in late summer and fall.

Eagles are opportunistic foragers, especially during the winter, when they eat whatever is available, including live fish, waterfowl, small mammals, and carrion. During the breeding season, bald eagles eat mainly fish. Wintering bald eagles tend to congregate near bodies of unfrozen water and roost communally. Major rivers and large reservoirs constitute the majority of winter habitats used, although the temporary presence of high-quality foods may entice eagles to areas far removed from aquatic zones. Roost sites are usually located in stands/clumps of mature or old conifers or cottonwoods.

Bald eagle populations have made substantial recoveries in recent years. The number of occupied bald eagle territories within Idaho continues to increase. USFWS Recovery Plan goals for management zones for this portion of the population have been exceeded during the last ten years. Formerly listed as endangered in 1978, the bald eagle was down-listed to threatened status in the lower-48 states in 1995. In March 1999, USFWS proposed to de-list the bald eagle throughout its entire range (Federal Register 1999: 64FR36453). On February 8, 2007, the USFWS announced it would make a final decision on whether to remove the bald eagle from the federal list of threatened and endangered species by June 29, 2007. Until a final ruling announcement is made the species remains protected under the ESA.

Gray Wolf

The gray wolf, a threatened species, is native to Idaho, but was extirpated in central Idaho by the 1930s. Wolves are habitat generalists, and were historically fairly common throughout the State in association with big game herds. The basic social unit in wolf populations is the pack. A pack can consist of 2 to 20 wolves (average of 10). Pack members have a strong social bond to each other, and establish and defend territories. Home ranges for reintroduced wolf packs in Central Idaho have ranged from 200 to 700 square miles over the last several years (C. Mack, pers. comm. 2007).

Historically, wolf population declines were due mainly to conflicts with humans. Increased roads and trails allowed for disturbance of den sites, shooting, trapping, and mortality associated with vehicle accidents (Theil 1985; Mech 1989; Mech et al. 1988; Boyd and Pletscher 1999).

In 1995 and 1996, wolves were re-introduced to central Idaho under an experimental non-essential population classification. All populations south of Interstate 90 in the State of Idaho and Montana, including populations on the PNF, are considered experimental/non-essential. Recovery in Idaho is occurring at a faster rate than expected (C. Mack, pers. comm. with A. Kuehl 2005).

On January 29, 2007, the Deputy Secretary of the Interior announced the FWS is proposing to remove the northern Rocky Mountain population of gray wolves from the federal endangered species list. The delisting process will likely take close to a year.

As of the summer of 2006, established wolf packs with young have been identified on all Ranger Districts except Weiser (C. Mack 2007, pers. comm.); however wolves are known to frequent areas on the Weiser Ranger District. In 2006, the Nez Perce Tribe wolf monitoring program documented 14 packs on the Payette National Forest. Seven of the packs contain radio-collared wolves. These 7, and 2 more packs, had a minimum of 6 wolves in each pack. The status of the five other packs is unknown, but each is likely composed of only a few wolves.

Currently, the main threats to wolves include mortality from shooting and vehicle collisions (Quigley and Arbelbide 1997c, Wisdom et al. 2000) and human disturbance near den sites leading to abandonment of the site (C. Mack, pers. comm. with A. Kuehl 2005). Primary management concerns for the Forest Service are (1) disturbance to denning wolves when pack numbers are low within individual recovery areas, and (2) providing adequate habitat for populations of prey species such as elk.

Rendezvous sites are specific resting and gathering areas used by wolves during the summer and early fall. Several rendezvous sites are used with the first one generally located between 1 – 6 miles from the natal den. Wolves appear to be most sensitive to human disturbance at the first rendezvous site and become less sensitive at later sites (USDI 1987).

Wolves primarily prey on ungulates (USDI 1987). During May and June, wolves selectively prey upon newborn and young bison, moose, elk, and deer in calving/fawning areas. During the summer and fall, ungulates constitute the highest percentage of biomass; in winter, wolves prey almost exclusively on deer, elk, and moose. Because they are an important prey item, factors affecting ungulate distribution and abundance can also affect wolves. Wolves are opportunistic hunters and habitat generalists. However, they tend to avoid areas with a lot of human activity.

Northern Idaho Ground Squirrel

The Idaho ground squirrel consists of two subspecies: the northern Idaho ground squirrel (*Spermophilus brunneus brunneus*), and the southern Idaho ground squirrel (*Spermophilus*

brunneus endemicus). The species is endemic to Idaho and is the only mammal to occur solely within the boundaries of the State. The northern Idaho ground squirrel was listed as threatened in April 2000. The southern subspecies occurs at lower elevations north of Payette River in Gem, Payette, and Washington Counties and is listed as a candidate species. Although this subspecies is not known to occur on the PNF, the FWS recently added it to the 90-day species list for the Weiser Ranger District. Northern Idaho ground squirrel (NIDGS) currently are distributed on state, federal, and private lands from northwest of Council to northeast of Lost Valley, Price Valley, and New Meadows, with one complex in Round Valley (Evans Mack 2006). Until 2005, all known NIDGS sites were within an elevational range of 1,050-1,675 m (3,440-5,500 ft). A new population was discovered in July of 2005 on the Payette National Forest at an elevation of around 7,500 feet, more than 2,000 feet higher than known existing populations. This changed the model of what constitutes suitable habitat and resulted in the discovery of two other high-elevation sites in 2006.

Habitat for this species is open grass/ shrub/ forest and meadows found predominantly on basalt created soils (Groves et al. 1997). Squirrel populations were found at 43 sites in 2006. Of these, 5 sites supported more than 100 individuals, whereas 22 sites supported less than 20 individuals. As of December 2006, the overall NIDGS adult/yearling population was conservatively estimated at 1,395. This is nearly a 50 percent increase from 2005's estimate of 940 NIDGS. New sites and more thorough surveys of known areas contributed to the increase, but actual gains in numbers of squirrels at some sites also contributed (Evans-Mack 2007).

Because of the current low population numbers, losses from any cause are of great concern. With such low population levels, major threats include vulnerability to shooting, poisoning, trapping, road kill, and predation. Disturbance from recreation activities, such as OHV use, is also a concern.

At this time, all known occupied NIDGS sites on the Forest are closed to cross-country travel; however, much of the Forest around these site closures is currently open to cross-country travel making enforcement of area closures difficult. Cross-country motor vehicle use can detrimentally impact northern Idaho ground squirrel habitat through soil compaction, removal of vegetation and physically harm to NIDGS individuals. Dispersed camping, especially during hunting season, is known to occur in occupied northern Idaho ground squirrel sites in areas closed to motorized cross-country travel.

Currently, sixteen occupied and one unoccupied northern Idaho ground squirrel site are adjoined or bisected by open roads or motorized trails under the jurisdiction of the Payette National Forest. Three of these occupied sites are also bisected by county roads. An additional six occupied sites are bisected by roads under county or private jurisdiction (Wildlife BA, Project Record).

Canada Lynx

The Canada lynx was listed as threatened under the ESA by the USFWS in March of 2000. No confirmed observations of lynx or lynx sign have occurred on Forest (CDC 2005). In April 1957, a lynx was trapped and confirmed by IDF&G along the Little Salmon River near Pollock, north of the Forest boundary. There have been unconfirmed sightings from near Brundage Mountain (1966) and Paddy Flat (1976).

In addition, there have been confirmed reports immediately north of the Salmon River, and near Warm Lake on the South Fork of the Salmon River on the Boise National Forest (F. Gordon 2005 pers. notes). It would appear, however, that the species was never common in this area. Surveys for lynx based on "capture" of lynx hair were conducted on the PNF in the Warren area and in the Frank Church River of No Return Wilderness and on adjoining Forests in 1999, 2000, and 2001.

Lynx hair samples were detected on the Boise National Forest during 1999. No hair was detected on the PNF (Forest Plan 2003).

The PNF Forest Plan (Forest Plan 2003: III-265) incorporated direction from the Lynx Conservation Assessment and Strategy (LCAS) (Ruedigar et. al. 2000) for the conservation of Canada lynx habitat and populations (i.e., TEST34). This direction includes the evaluation of areas called Lynx Analysis Units (LAUs). There are 39 Lynx Analysis Units (LAUs) on the Forest, including the FC-RONR Wilderness.

As described in the LCAS (Ruedigar et. al. 2000: 7-2): "Several of the conservation measures require analysis units within which rather specific parameters can be measured (e.g., no net increase in groomed over-the-snow routes). LAUs provide this analysis unit….LAUs will likely encompass both lynx habitat…and other areas….Conservation measures (objectives, standards, and guidelines) generally apply only to lynx habitat within LAUs." The LCAS (p. 46) describes lynx habitat in central Idaho as lodgepole pine communities, interspersed with subalpine fir, lodgepole pine, Engelmann spruce, moist Douglas-fir and moist grand fir habitat types. Approximately 20 years following fire, lodgepole pine can provide optimum snowshoe hare winter habitat, which constitutes quality lynx foraging habitat. Through habitat modeling and on ground verification, extensive potential lynx habitat has been identified on the PNF with the majority occurring east and north of McCall (C. Hescock, pers. comm. with A. Kuehl 2005).

Lynx are usually more active at night than during the day. Preferred winter food consists primarily of snowshoe hares, along with rodents such as red squirrels, and birds. Suitable habitat for hares generally consists of young conifer stands with relatively dense and interconnected canopies that provide both cover and food. Snowshoe hare habitat is limited on the PNF, in part due to fire suppression which has reduced conifer disturbance and subsequent regeneration. Recent large fires in 1994, 2000, 2004, and 2006 likely have increased potential snowshoe hare habitat. Denning habitat for lynx occurs in mature and late structural boreal forests with locally abundant large woody debris.

Risk factors for lynx include direct human threat (shooting, trapping, vehicle collisions), as well as changes in forage and denning habitat. Fire suppression and logging have altered the mosaic of habitats needed for prey species and denning sites (Wisdom et al. 2000). Roads and trails have resulted in increased human access and activity in lynx habitat, particularly during critical winter months.

Lynx have evolved a competitive advantage in deep snow environments due to their large paws allowing them to hunt prey where other predators cannot because of snow conditions. There is a concern that compacted snow routes allow other predators (such as coyotes) access into areas that are normally the exclusive winter range of the lynx. Advances in snowmobile capabilities have raised concerns about intrusion into previously isolated areas (Wisdom et al. 2000; USDI FWS 2000). Snowmobiles can traverse vast forest areas in short periods of time. This increased access can increase lynx disturbance and vulnerability to harvest, collision, or harassment.

Existing Condition - Sensitive Species

Columbia Spotted Frog – Northern Population

The Columbia spotted frog (*Rana luteiventris*) has a wide distribution in central Idaho. They are found in or near a perennial water body such as a spring, pond, lake, or sluggish stream. Spotted frogs are most often associated with non-woody wetland plant communities like sedges, rushes, and grasses. In winter they seek out springs and other areas of water where water is largely unfrozen during the winter months. Recent research has shown spotted frogs are capable of

changing location during winter months (Pearl pers. comm. 2005; E. Bull pers. comm. 2005). Spotted frogs have been documented across the Forest.

Cross-country motorized travel can impact spotted frogs and frog habitat by driving through wetland sites and shallow ponds. This type of activity can injure or kill individual frogs, destroy egg masses, and reduce habitat suitability.

Boreal Owl

Boreal owls (*Aegolius funereus*) inhabit high elevation spruce-fir, mixed conifer, and aspen forests generally above 6000 feet in central Idaho (Hayward 1989). These owls have been studied on the eastern portions of the Payette National Forest (Hayward 1988) where they have been found from Fisher Creek to Secesh Summit across to Chamberlain Basin (in the Wilderness) (Groves et al. 1997; Stephens and Sturts 1991). No observations of boreal owls have been recorded on the western side of the PNF.

Boreal owls are secondary cavity nesters that use spruce fir stands for nesting, roosting and foraging. Boreal owls nest in old woodpecker cavities in live and dead trees. They forage on red-back voles, flying squirrels, and small rodents.

Boreal owls do not migrate. Winter home ranges encompass about 3,600 acres and summer home ranges are slightly smaller (USDA Forest Service 1991). Forest management can change the composition and structure of vegetation used by this species. Management activities that affect large snags and down logs are important habitat considerations for this species. Scientists have estimated an increase of one percent in source habitat from historical to current times for this species within the Central Idaho Mountains Ecological Reporting Unit (ERU), which includes nearly 90 percent of the Payette National Forest (Wisdom et al. 2000).

Flammulated Owl

Flammulated owls (*Otus flammeolus*) have been documented primarily on the western portion of the Forest. They are present on the Forest only during the breeding and nesting season and migrate off the Forest in winter. Important habitat components include mature and old forests of Douglas-fir, ponderosa pine, and mixed conifers; a moderate density of large trees; and snags with nesting habitat created by larger woodpeckers and sapsuckers (Spahr et al. 1991, Groves et al. 1997). Appropriate habitat is found on the western portion of the Forest and along the Salmon River and its tributaries (Groves et al. 1997, Stephens and Sturts 1991). Territory size is about 5.2 square kilometers; males show strong territory fidelity, but females may disperse to adjacent territories (Reynolds and Linkhart 1987). Territorial boundaries often occur along ridge tops (Reynolds and Linkhart 1987). They feed almost entirely on flying insects.

Occupied flammulated owl habitat has changed during the last hundred years due to human activities (Morgan and Parsons 2001, Sloan 1998). Major changes in habitat have occurred within the Forest from: selective harvesting of large-diameter ponderosa pine, snag removal, and a change in composition and density of remaining stands because of long-term fire exclusion (Geier-Hayes 1995; ICBEMP 1997c; Morgan and Parsons 2001; Sloan 1998; Wisdom et al. 2000). These and other changes have reduced habitat quality, quantity, and distribution. Important management considerations for this species include retaining or restoring older mid- to lower-elevation forests dominated by ponderosa pine and Douglas fir, and retaining or restoring snags and down logs (Wisdom et al. 2000). Scientists estimate a reduction of 52 percent in source habitat from historical to current times for this species within the Central Idaho Mountains Ecological Reporting Unit (ERU) (Wisdom et al. 2000).

Great Gray Owl

Great gray owls (*Strix nebulosa*) are a naturally uncommon species that occurs in localized areas on the Forest. Breeding populations have been documented near McCall and in the Frank Church River of No Return Wilderness (Atkinson 1989; Stephens and Sturts 1991). Great gray owls inhabit forested areas with intermixed open grassy meadows or open forest stands with a grass-dominated understory that allow foraging for small rodents (Groves et al. 1997). The owls use existing nest structures (broken topped dead trees, old raptor nests, mistletoe brooms, or man-made platforms) generally near (within 150 yards) openings. The habitat components considered most important for this species are mature or older forest for nesting and open areas for foraging (such as meadows or seedling forests). Timber harvest and removal of snags and trees with broken tops in forested areas with meadows may impact habitat for this species.

The great gray owl is a year-round resident on the Forest. Wisdom et al. (2000) estimated an increase of 32 percent in source habitat from historical to current times for this species within the Central Idaho Mountains Ecological Reporting Unit (ERU), which contains 90 percent of the Payette National Forest.

Northern Goshawk

The northern goshawk (*Accipiter gentiles*) breeds and is a resident in all western states including Idaho. This species breeds on the PNF (Stephens and Sturts 1991), and observations of goshawks have been recorded Forest-wide.

Goshawks require mature to over mature dense canopy forests for nesting and forested areas and open inclusions for foraging on birds and small mammals. Goshawks have a high fidelity to nest areas, often using them for more than one year, and sometimes intermittently for decades (Reynolds et al. 1992; Wisdom et al. 2000). Many pairs of goshawks have two to four alternate nest areas within their home range. All previously occupied nest areas may be important for maintaining nesting populations because they contain the habitat elements that originally attracted the goshawks. Replacement nest areas are advantageous because goshawk nest stands are subject to loss from natural disturbance events and tree mortality.

Goshawk nest areas typically have high tree canopy cover and a higher proportion of larger trees then surrounding areas. Studies suggest that dense vegetation provides relatively mild and stable microenvironments, as well as protection from predators. Nest areas are usually classified as mature and late structural forest stands (Reynolds et al. 1992; Graham and Jain 1998). Human activity during the nesting period may cause the nest to be abandoned and subsequent nest failure (Reynolds et al. 1992; Braun et al. 1996).

Fisher

The fisher (*Martes pennanti*) was considered extinct or extremely rare in Idaho by the 1950s. A fisher re-introduction program was initiated in north-central Idaho in the early 1960s. Fishers were released near Chamberlain Basin and north of the Salmon River. There is a low probability of fisher presence because of the lack of confirmed observations and their rareness.

Fishers are found in mature to old forests with high canopy closure and large tree (both live and dead) structure. They avoid large openings. They are associated with mesic forest conditions and forested riparian areas. Natal dens have been located in pileated woodpecker cavities and other forest structures. They eat small mammals (particularly red-backed voles), birds, fish, amphibians, insects, carrion, fruit, and nuts. Fishers hunt for prey on the forest floor and in trees and snags (Natureserve 2005). Vegetation management and fire suppression have influenced

habitat of this species and its prey by altering composition and structure. Wisdom et al. (2000) estimate an increase of 35 percent in source habitat from historical to current times for this species within the Central Idaho Mountains ERU.

Wolverine

The wolverine (*Gulo gulo*) is a wide-ranging carnivore that is suited to extensive, remote, often high-elevation areas. Adult wolverines are mostly solitary animals that range widely over a variety of habitats from forested drainage bottoms to high-elevation, sparsely timbered cirque basins. Wolverines are considered forest carnivores because they typically occupy habitats within or near forest cover (Hornocker and Hash 1981:1291). Their substantial use of non-forest alpine habitat distinguishes them from the fisher and marten. They also depend less on large woody structures than fisher or marten (Ruggiero et al. 1994).

Wolverines have large, overlapping home ranges. In central Idaho, home ranges have been documented as large as 802 square miles for males, although female ranges tend to be smaller. The wolverine is typically associated with vast, remote, undisturbed areas of limited human intrusion. However, they are known to cross through human developments and high human use areas (Hash 1987). Physical barriers such as mountain ranges, valley bottoms, large rivers, reservoirs, and major highways do not appear to affect movement patterns of wolverines (Hornocker and Hash 1981:1299).

Wolverines are considered habitat generalists in the summer, using a foraging strategy typical of opportunistic omnivores (Banci 1994:113). Food is more available in spring and summer with a wider variety of potential food sources including carrion, small mammals, insects and insect larvae, eggs, and berries. Both male and female wolverines occupy higher elevations where temperatures are cooler during the summer months (Hornocker and Hash 1981:1298). Wolverine breeding seasons vary from late spring to early fall, but generally occur during early summer (Hash 1987). Delayed implantation of embryos results in winter birthing of kits, generally between January and April (Banci and Harestad 1988).

In winter, wolverines adapt their foraging strategy to scavenging. Physical adaptations such as massive skull structure, powerful jaws, strong teeth, and overall body strength make the wolverine highly suited for feeding on carrion, including the ability to crush large bones and chew through frozen meat. An acute sense of smell allows wolverines to locate carrion in deep snow. Wolverines are capable of direct predation on animals many times their size, particularly when prey animals are weakened. However, wolverines are not as efficient at killing as other carnivores such as mountain lion and gray wolf (Hash 1987).

Winter forest carnivore surveys in Montana (Inman et al. 2003) have recorded most winter wolverine locations at elevations above 6,800 feet. Winter presents a very challenging time for wolverines, as it is the denning season for reproductive females and they are in constant search of limited food supplies.

Across the wolverine's range, the majority of known natal den sites involve areas of deep snow accumulation, with snow tunnels often forming part of the den infrastructure (Magoun 1985; Copeland 1996). Magoun and Copeland (1998) describe wolverine reproductive dens found in Alaska and Idaho. A series of den sites are often used during the reproductive season. Natal dens are those where kits are born, whereas maternal den sites are used after parturition, but before weaning of kits. Dens used by wolverine families after kits are weaned are referred to as rendezvous sites. Nearly all verified reproductive den sites reported by these authors were found at higher elevations, in areas where snow regularly accumulates to depths of 3-16 feet. Den sites involve extensive snow tunnel systems, often associated with large rocks or fallen trees, and

sometimes lead to adjacent tunnel systems in boulder talus piles. In Idaho, two natal dens were located in subalpine cirque areas on north-facing slopes, suggesting that this type of habitat is important in central Idaho (Copeland and Harris 1994).

Due to their large home range size and habitat needs, this species is and most likely always has been rare and uncommon. Areas wolverines are known to inhabit are typically unmodified by human activities, due to their remote, steep, and harsh environments (Sallabanks 1996). Wilderness and roadless lands account for much of the areas wolverines are known to use (Copeland and Harris 1994).

Though rare, wolverines occur across the PNF. CDC historical data shows sightings of wolverine within each MA on the Forest. A 1940s article in the Idaho Statesman contained an article reporting wolverine damage to overnight cabins along the mail route from Indian Valley to Warren during the winter of 1875.

More recently, wolverines have been detected in the Payette Lakes MA (#7) and the Goose Creek/Hazard Creek MA (#6). A radio-collared two year old male wolverine from a Sawtooth National Forest study was detected near Box Lake in the Payette Lakes MA directly following the 1994 fires. The collared wolverine moved directly west crossing the Warren Wagon Road and continued toward Brundage Mountain. The male was last located near Bruin Mountain (north of the Brundage Mountain ski area) in February 1995. The most recent and verified evidence of wolverine has occurred in the last three years (2004-2006). Four of these seven locations were from winter track surveys conducted by IDF&G (D. Evans-Mack, pers. comm. 2006) in MAs 6 and 7. On two separate occasions, wolverine were live trapped by Wildlife Services – one, a male, near Lava Ridge Saddle in August 2005 and the other near Fisher Creek saddle in July 2005. Wolverine tracks were also located near the headwaters of Nethker Creek in October 2005. Maps of wolverine locations are in the Wildlife Specialist Report (Project Record).

Northern Three-toed Woodpecker

Northern three-toed woodpeckers (*Picoides tridactylus*) are present throughout the higher elevations of west-central Idaho in spruce-fir and lodgepole forests (Groves et al. 1997). They have been found on the Forest in lodgepole pine and spruce-fir forests (Groves et al. 1997). Wood boring insect larvae, such as mountain pine beetles, is their primary food source. Three-toed woodpeckers reside in low numbers between large fire events. These woodpeckers increase the first year following fire, and then decrease as insect populations decline. At other times, the species appear to rely on small patches of dead trees resulting from localized insect outbreaks. Management for abundant snag densities typical in higher elevation forests is an important habitat consideration. The processes (fire, insects, and disease) that generate these high densities of snags are essential to the woodpecker's habitat.

The large fires that burned in the year 2000 on the PNF improved the habitat for this species. Wisdom et al. (2000) estimates an increase of 77 percent in source habitat from historical to current times for this species within the Central Idaho Mountains ERU.

White-headed Woodpecker

The white-headed woodpecker (*Picoides albolarvatus*) range in Idaho is limited to the western edge of the state. Its primary range is in California, Oregon, and Washington. This species selects for open, dry ponderosa/ Douglas-fir forests with mature to old ponderosa pine/Douglas-fir trees for foraging and nesting. Appropriate open dry Forest habitat is found on the western portion of the Forest (Groves et al. 1997). White-headed woodpeckers have been documented in these

habitats on the Council, Weiser, and New Meadows Ranger Districts. Based on studies completed in Idaho they are considered year-round residents with little to no migration.

White-headed woodpeckers feed on conifer seeds during the fall and winter. Cone crops are different from year to year, and large trees usually produce more cones than small trees. During other times of the year, flying insects are an important food source.

Nests are usually excavated in large-diameter snags (greater than 20 inches in diameter) with a moderate degree of decay (Bull et al. 1986; Bull et al. 1997; Wisdom et al. 2000). Nesting stands of ponderosa pine used by white-headed woodpeckers have a low canopy cover (generally less than 30 percent) (Frederick and Moore 1991).

White-headed woodpecker habitat has changed during the last hundred years due to human activities such as selective harvesting of large-diameter ponderosa pine trees, snag removal, and a change in composition and density of remaining stands because of long-term fire exclusion (Morgan and Parsons 2001; Sloan 1998; Wisdom et al. 2000). These and other changes have reduced the quality, quantity, and distribution of white-headed woodpecker habitat. Habitat conservation is focused on restoration of mature to old, low-density ponderosa pine forests with snags (Wisdom et al. 2000). Wisdom et al. (2000) estimate a reduction of 62 percent in source habitat from historical to current times for this species within the Central Idaho Mountains ERU.

Existing Condition - Management Indicator Species

Management Indicator Species (MIS) are biological indicators representing a whole group of other species using similar habitats. These are species whose population changes are believed to indicate effects of management on other species of a major biological community. The Forest provides for the maintenance and improvement of habitats for these indicator species.

The white-headed woodpecker is both a sensitive species and a MIS on the PNF (see description above). The analysis of effects to woodpeckers of concern (white-headed, three-toed, and pileated woodpeckers) is consolidated into one part in the environmental consequences section.

Pileated Woodpecker

The pileated woodpecker (*Dryocopus pileatus*) is the PNF Management Indicator Species (MIS) for species utilizing mature forests. Preferred habitat consists primarily of mature and older forest stands having a high density of standing dead and down trees with heart rot. Pileated woodpeckers create cavities that are subsequently used by species incapable of excavating their own nesting or roosting cavities, such as the flammulated owl (USDA Forest Service 2003a). These woodpeckers are fairly common on the PNF and have been documented to occur on all ranger districts (Groves et al. 1997). Monitoring transects and plots were established on the Forest during the spring of 2003. Data have been collected for too short a time period to identify population trends. The overall trend across North America and for the Central Idaho Mountains is believed to be increasing primarily as the result of long term fire exclusion (Wisdom et al. 2000).

Existing Condition - Neotropical Migratory Birds

Neotropical migratory birds are defined as those birds that regularly winter south of the Tropic of Cancer and summer in North America. The Migratory Bird Treaty Act (MBTA) implements various treaties and conventions for the protection of migratory birds. Under the Act, taking, killing, or possessing migratory birds, including nests and eggs, is unlawful.

An executive order was signed in 2001 outlining responsibilities of federal agencies to protect migratory birds under the Migratory Bird Treaty Act (MBTA). As a complimentary measure to

the Executive Order, the Forest Service and the U.S. Fish and Wildlife Service entered into a Memorandum of Understanding (MOU), for the purpose of strengthening migratory bird conservation through enhanced collaboration between the agencies, in coordination with state, tribal, and local governments. This MOU serves as guidance for the two federal agencies until more detailed direction is developed pursuant to the Executive Order. Additional information on the Act, Order, and migratory birds of concern on the PNF is provided in the Wildlife Specialist Report.

Neotropical migratory birds live in a wide variety of habitats on the Forest. Idaho Partners in Flight is a multi-agency group dedicated to the conservation of migratory birds. This group has identified and prioritized four habitats that support migratory species of moderate to high vulnerability, and species with declining or uncertain population trends. These habitats are riparian areas, non-riverine wetlands, sagebrush shrub, and dry ponderosa pine/Douglas-fir/grand fir forests (Idaho Partners in Flight 2000). These four habitats were selected because they are the most altered by past and present human activity in Idaho (Idaho Partners in Flight 2000). The habitats support 35 at risk bird species that breed in Idaho (Idaho Partners in Flight 2000).

Existing Condition - Elk

Rocky Mountain elk are a species of special interest. Elk are a desirable big game animal pursed annually by recreational hunters in the local area and across the State. Elk are adaptable and occur in a variety of habitats ranging from high mountainous areas to managed forests to cold deserts (Skovlin et al. 2002). Elk were widespread prior to the settlement of North America, but due to habitat alterations and extirpation, are now found primarily in coniferous forests (Skovlin et al. 2002). On the Forest, elk use the higher elevations in the summer months and descend to lower elevations on the Forest and adjacent state and private lands in winter.

Elk are managed to achieve particular population goals. They are one of the more manageable species because their habitat requirements are well studied and they respond to habitat and population management (Cooperrider 2002). Across the Forest, elk habitat has been modified by management activities; such as timber harvest, road construction, livestock grazing, and fire suppression, as well as natural events, such as wildfire and insect and disease infestations.

Management for elk and elk habitat becomes increasingly more complex as human activities affect habitat quality and access. Managing for elk requires maintaining quality habitat, meeting public demands, and understanding the socioeconomic value of elk. Primary considerations in elk management (Lonner 1991) include:

- Maintaining habitat security to protect elk during the hunting season.
- Preserving/recovering desired elk population characteristics as determined by elk managers and distributions relative to land management.
- Satisfying the growing demand for quality hunting and non-hunting experiences.

Methodologies have been developed that measure elk vulnerability, which include the relationship between elk and land management practices and the demand for elk hunting and non-hunting experiences. These methodologies generally reflect seasonal habitat needs. These different seasonal habitat needs are described below and include summer range, security habitat during the hunting season, and winter range. Effects of the Travel Plan, particularly roads and motorized recreation on seasonal habitats are discussed in the environmental consequences section.

Summer Range

The energetic demands of elk - growth, development, lactation - are high during the summer months as elk are simultaneously recovering from weight lost during the previous winter, supporting young of the year through lactation, and building fat reserves for the coming winter. During late spring and summer, there is a need for secluded calving areas and summer range rich in nutritional forage. Elk calving generally follows the snow-line as it melts in the spring. Therefore, calving occurs along an elevational gradient. Long-term productivity of elk is in part based on the quality of summer and transitional ranges.

Research indicates the quality of summer range as one of the more important variables in determining annual variation of herd growth. Management of summer range includes consideration of disturbances that might discourage elk use of an area (Van Dyke et al. 1994). Roads and motorized recreation are disturbances that can discourage use of an area, lower reproductive success, and cause loss and fragmentation of habitat (Grover and Thompson 1986, Hamilton 1997, Rowland et al. 2000, Ward and Cupal 1979).

Currently, slightly more than 500,000 acres on the Forest are open to cross-country motor vehicle use in summer, although many of these acres cannot be traveled due to limits imposed by vegetation and topography. In summer, the density of authorized roads and motorized trails (miles/square mile of NFS land in the 5th HU watershed) is less than 2 miles per square mile in all watersheds except Pine Creek (2.1 mi/mi.^{2}), Goodrich-Bacon (2.2 mi/mi.^{2}), West Fork Weiser (3.0 mi/mi.^{2}), and Upper Weiser River (2.2 mi/mi.^{2}). (Note three watersheds with less than 1,000 acres of NFS land were not analyzed due to the small size).

Security Habitat During Hunting Season

National Forest System lands provide substantial habitat and hunting opportunities, for elk. During the hunting season, elk management balances the protection of certain sex and age classes with the need to provide hunting opportunities. While IDF&G has the primary role in this management, the Payette National Forest strives to compliment these objectives through management of open road densities and other activities that may impact elk populations.

The Forest lies within four Elk Zones established by IDF&G: Brownlee, Weiser River, McCall, and Middle Fork. The Elk Zones include 11 Big Game Management Units (19A, 20A, 22, 23, 24, 25, 26, 27, 31A, 32, 32A). IDF&G has identified herd management objectives for each of the Elk Zones and for most management units (Table W-3).

Current populations of elk on the Forest are estimated by IDF&G at regular intervals, though numbers of elk can change during the year (Table W-3). Elk populations on the Forest are highest during the spring and summer, as elk migrate back from winter range areas and calves are born (Unsworth et al. 1993; Christensen et al. 1995; IDFG 1999). Forest Service management actions such as travel management, road construction or obliteration, and vegetation management can influence mortality rates during the hunting season.

Population and harvest goals within Big Game Management Units are established by the State with public participation. Five of the eleven Big Game Management Units (Unit 31, 32A, 20A, 26, and 27) are currently below state objectives for estimated bull and adult bull populations, while three are above and two meet the objectives (Table W-3). No data are available for Unit 24.

Table W-3: Recent (2004-2006) Bull Elk and Adult Bull Elk Population Estimates and Objectives for the Payette National Forest Big Game Hunting Units

Elk Management Zones / Hunting Units										
Brownlee (2004)	Weiser River (2004)			McCall Zone (2005)				Middle Fork (2006)		
31	22	32	32A	19A	23	24	25	20A	26	27
Bull Population Estimates										
64	327	142	34	275	389	ND	216	219	152	463
Bull Population Objectives										
125-175	250-350	50-100	150-200	150-250	225-325	ND	150-225	250-400	200-350	500-800
Meeting (M), Not Meeting (N), Exceeding (E) Objectives										
N	M	E	N	E	E	ND	M	N	N	N
Adult Bull Population Estimates										
20	137	57	10	190	216	ND	183	119	91	240
Adult Bull Population Objectives										
50-100	125-200	40-60	75-125	100-150	125-175	ND	75-125	150-250	150-200	300-450
Meeting (M), Not Meeting (N), Exceeding (E) Objectives										
N	M	M	N	E	E	ND	E	N	N	N
Percent of FS Administered Land within Hunting Units										
18	55	1	58	94	62	42	98	99	98	99

ND = No Data

Although not all units meet state objectives, overall elk populations are good. Present habitat conditions do not appear to be limiting the populations within the Forest, but elk vulnerability is a concern for several units on the Forest (J. Rohlman, pers. comm. with A. Kuehl, 2005). Elk vulnerability is defined as a measure of elk susceptibility to being killed during the hunting season (Christensen et al. 1995). This susceptibility is a function of access to elk and the quality of cover for elk. Roads provide access for hunters and poachers, leading to increased elk mortality.

Of the units not meeting state objectives, three in the Middle Fork Zone (units 20A, 26, 27) occur in the FC-RONR Wilderness and are lightly roaded. Unit 32A and 31 occur in areas with higher densities of roads. The condition of vegetation cover plays an important role in elk security during the hunting season (Hillis et al. 1991, Lyon 1983, Lyon and Canfield 1991). This coupled with road density and pattern and off-road travel, all play an important role in determining the security level an area provides to elk during the hunting season. An area with sparse cover and low road densities may provide as much security as the same sized area with heavy cover and high road densities (Lyon et al. 1985).

An important aspect of elk management is limiting elk vulnerability during the hunting season. On the PNF, seasonal and year-round travel restrictions have been implemented in locations where elk lack secure habitat due to road densities and/or lack of cover.

Elk vulnerability is determined and managed in various ways. Common strategies on the PNF include management of motorized road and trail densities (miles/square mile) and cross-country motorized access. Another strategy evaluates the amount of elk security provided in a specific area. This approach recommends retaining 30 percent or more of the analysis area in nonlinear blocks of secure habitat equal or greater than 250 acres in size and more than ½ mile from motorized access (Hillis et al. 1991, Lyon and Canfield 1991, Forest Plan Appendix E).

Currently, slightly more than 500,000 acres on the Forest are open to cross-country motor vehicle use in fall, although not all these acres can be traveled due to limits imposed by vegetation and topography. In fall, the density of open authorized (or NFS) roads and motorized trails

(miles/square mile of NFS land in the 5th HU watershed) is less than 2 miles per square mile in every watershed (three watersheds with less than 1,000 acres of NFS land were not analyzed due to the small size).

Methods for evaluating elk habitat security are described in the Wildlife Specialist Report and summarized here. Elk analysis areas (EAA) generally followed the boundaries of 5th level HU watersheds and ranged in size from 30,000 to 80,000 acres. Eleven EAAs were originally designed on the west side of the PNF in coordination with IDF&G. Sixteen additional EAAs on the east side of the PNF were identified for the Travel Plan analysis. In each EAA, security habitat is defined as areas 250 acres and larger in size located at least½ mile from an open road or motorized trail. Security areas should comprise 30 percent or more of the EAA on NFS lands. Security areas are identified by buffering open roads and motorized trails administered by the Forest for ½ mile on either side and characterizing remaining available habitat by vegetative type to identify suitable hiding cover (security habitat) in blocks more than 250 acres in size.

Currently, eighteen of 27 EAAs (mostly on the east side of the Forest) have more than 30 percent of the area more than ½ mile from an open road or motorized trail. Of these, only three EAA are comprised of hiding cover blocks ≥ 250 acres in size that total at least 30 percent of the area.

Winter Range

The majority of elk winter range occurs outside the Forest boundary on lower elevation grasslands. An estimated 186,000 acres of winter range occur on the Payette National Forest outside of the FC-RONR Wilderness. Another 178,000 acres occurs in the Wilderness.

Elk populations are lowest during the winter after they migrate to lower-elevation winter range following the hunting season in the fall. Additional mortality usually occurs on winter ranges, depending on forage quantity and quality, predators, and the severity of the winter. Recent mild winters have likely contributed to current high elk numbers.

Winter range is an important element of elk habitat. Areas with minimal human activities and adequate forage will reduce the energetic costs associated with over winter survival. Snowmobile traffic is one form of disturbance potentially impacting on wintering elk. Winter range travel restrictions are intended to prevent disturbance and harassment of elk during a period when physical stress is already relatively high. Because of the importance of winter ranges to elk, the Forest has closed much of the elk winter ranges to over-snow vehicle use. Currently 105,000 acres are closed and 81,000 acres are open, but the open acres largely fall below the average snowline (estimated at 4,000 feet) and so are not impacted by snowmobile use.

3.6.5 Environmental Consequences

The wildlife effects section is organized as follows: First a general summary of the effects of motorized recreation is provided. This summary is not specifically linked to a species, issue, or indicator. Effects are then discussed by groupings of wildlife species. The groupings are: Threatened, Endangered, Proposed, and Candidate Species; Sensitive Species; Management Indicator Species; Migratory Birds; and Elk. Within these groupings, effects are discussed by species. Where applicable, effects are tracked based on a specific issue and indicator (see Scope of the Analysis above). For each species (or species group in the case of migratory birds) the effects common to all alternatives are discussed first, followed by the direct, indirect, and cumulative effects.

Effects Common to All Alternatives

Summary of General Effects of Roads, Trails, and OHV Use

The Chief of the Forest Service has identified unmanaged recreation, especially impacts from off-road vehicles, as one of the key concerns facing the Nation's forests and grasslands. The Forest Service's "Background Paper with Key Messages and Talking Points: Unmanaged Recreation - Impacts from OHVs" (USDA Forest Service 2004) identifies threats associated with unmanaged off-route use. Those especially applicable to wildlife include:

- Severely eroded soils
- Damaged wetlands and harm to wetland species
- Habitat destruction
- Spread of invasive species

Roads and trails, regardless of their use, affect ecosystem characteristics and habitat conditions for many species (Forman et al. 2003; Gaines et al. 2003). Roads interrupt landscape patterns, fragment habitat, and create edge habitats, which can inhibit the occurrence and movement of important interior species (Forman and Alexander 1998; Trombulak and Frissell 2000). The actual road or trail prism can compact soils and removes cover, while the use of the road, trail, or area (to OHVs) decreases wildlife habitat effectiveness through disturbance and displacement and additional habitat loss (Busak and Bury 1974 as cited in USDA and USDI 2001: 70). Habitat can also be lost through the spread of noxious weeds by off-road vehicle use (USDA and USDI 2001: 71 – 72) and through firewood cutting that removes down logs and snags (Bate and Wisdom 2002a; Bate and Wisdom 2002b; McShane et al. 2003).

Some wildlife species exhibit increased stress levels in response to motorized vehicles. These physiological responses can potentially lead to changes in reproductive success, rates of growth, incidences of disease, and survivorship (Bowles 1995). Some wildlife species change their behavior in response to roads and motorized uses. These changes may be short or long-term (Knight and Cole 1995a). Short-term behavioral changes may include temporary movement away from the disturbance, changes in parental attention, nest abandonment, changes in food habits, increased flushing, increased vocalizations, flush/flight responses, freezing/limiting movement, changes in social interactions, and short-term avoidance (Bury and others 1977; Knight and Cole 1995a; Weinstein 1978). Longer-term changes may include abandonment of preferred foraging or nesting areas (Knight and Cole 1995a). Long-term or repeated short-term behavioral changes can lead to long-term effects on individuals and populations (Knight and Cole 1995a; Knight and Cole 1991).

Roads and trails can serve as movement corridors for species, particularly larger bodied species, and may increase the access of some predators to prey populations (Forman and others 2003). Vehicle use can affect wildlife directly through collisions, hunting, harassment, and interference, including noise (Knight and Cole 1995a: Fig. 4). Interference and harassment can result in a variety of physiological and behavioral responses that, in turn, can affect occupancy, abundance, and productivity. Additional information on the general effects of roads and trails and the effects of motorized use is provided in the Wildlife Specialist Report (Project Record).

Summary of General Effects of Over-Snow Vehicle Use

Researchers have summarized studies on the environmental impacts of over-snow motorized use (e.g., Boyle and Sampson 1985; Bury 1978; Gutzwiller 1991; Knight and Gutzwiller 1995). Studies have focused primarily on effects resulting from snow compaction. Snow compaction can potentially impact wildlife species and habitat conditions through alterations in the temperature profile and thermal conductivity of snow; increases in water-holding capacity; increases in

melting times; and the formation of a partial gas seal over the substrate (Neumann and Merriam 1972; Keddy et al. 1979). Studies on habitat have also shown (Foresman et al. 1976; Ryerson et al. 1977; Walejko et al. 1973) substantial impacts on subnivean vegetation, including damage, reductions in standing crop, and retarded spring recovery and growth.

Studies on the effects of snow compaction on wildlife are few, but mortality of subnivean fauna (Schmid 1972) and mechanical barriers to movement by subnivean mammals (Pruitt 1984) are possible consequences. Snow compaction effects may vary considerably according to snow depth and moisture content (Bury 1978). Other studies have reported that some groups of wildlife, such as canids, preferentially use compacted trails, presumably because of greater ease of travel. Others, such as snowshoe hare, avoid these trails, possibly in order to avoid predators (Neumann and Merriam 1972).

Effects on forest carnivores have thus far been inferred from reviews of the literature rather than being directly studied or monitored. For example, Robitaille and Aubry (2000) found densities of marten tracks significantly higher away from roads. Several authors (i.e., Bury 1978; Neumann and Merriam 1972) have reasoned that compaction and the resultant mortality of small mammals could lead to declines in predator populations because some predators forage in the subnivean zone and compaction may limit or prevent their access.

For most species on the PNF, the effects of motorized over-snow use, including the effects of snow compaction, are likely to be limited (Wildlife Specialist Report: Project Record). For species that are rare (such as lynx) or at risk (such as wolverine), or of high public interest (such as elk), the effects may be more than limited or negligible. The effects of motorized over-snow use for these "species of concern" are described below.

Summary of General Effects on Habitat Connectivity

Connectivity is the ability of the landscape to provide dispersal, migration, and travel opportunities between suitable habitat patches for wildlife species. Connectivity is important because it allows animals to move between different habitats to meet their daily and lifetime needs (Forman et al. 2003: 129-133). It also allows for population persistence through maintenance of population size and interchange and repopulation of unoccupied areas. Reduced movement results in empty habitats or habitats with smaller populations than they can actually support. This increases the risk of local extinction and subsequently results in a lower regional population and lower long-term population persistence (Forman et al. 2003: 129-133). In short, habitat or landscape connectivity can contribute to long-term species survival (Noss et al. 1996). Habitat that is not connected is "fragmented." Hence, fragmentation also may lead to isolation of populations, reduced population size, and an increased risk of extinction.

Connectivity may be hindered by unsuitable habitat including roads and trails. Some wildlife species prefer road areas (Knight and Kawashima 1993; Knight et al 1995) because food (such as road kill) may be more available or because roads provide an open travel way. Some species (e.g., forest interior species) avoid roads because they functionally separate their habitat. Motorized access on roads and in areas, including over-snow access in winter, may impact habitat connectivity by disturbing animals and causing them to avoid an area.

The extent to which a road acts as a barrier depends on an animal's behavior, dispersal ability, and population density along with the juxtaposition of the habitat adjacent to the road (Lovallo and Anderson 1996). Roads can present barriers and otherwise impede movement especially for smaller animals or animals with limited mobility (Mader 1984; Swihart and Slade 1984; Trombulak and Frissell 2000). Other species that do not avoid roads may still be impacted (e.g., road-killed).

The PNF contain high densities of roads in some areas (especially on the west-side); however, numerous areas without roads exist throughout the Forest as well. The PNF likely provides important habitat corridors for several species of wildlife such as wolf, wolverine, and migratory birds. These corridors help ensure connectivity to other important habitats on adjacent lands.

Summary of General Effects on Snags and Down Logs

Snags and coarse wood are important habitat components for many species. Sixteen species of birds and nine species of mammals are dependent on snags and/or down logs to meet some part of their life stage such as nesting, denning, or foraging (Wisdom et al. 2000). On the PNF, snag associated species include lynx, pileated woodpecker, white-headed woodpecker, northern three-toed woodpecker, boreal owl, flammulated owl, great gray owl, and northern goshawk.

Natural disturbances such as fire, wind, insects, disease, and landslides, along with plant succession, help create coarse woody debris. The PNF Forest Plan (2003) states that in general, the current condition of snags and downed logs appear to meet the historical/desired conditions for snag numbers. Generally, subalpine fir type stands contain higher numbers of snags. The drier ponderosa pine and Douglas-fir types contain lesser amounts.

Direct effects to snag and down log habitat occur when habitat is lost through road or trail construction (Hann et al. 1997; Trombulak and Frissell 2000). None or minimal new road or trail construction is proposed with any of the alternatives so the direct effect on snag and down log habitat would not be a measurable impact for any of the species of concern.

Indirectly, roads negatively impact the availability of snags and down logs for wildlife by providing access for firewood retrieval (Hann et al. 1997; Joslin and Youmans 1999; Bate and Wisdom 2002a, 2002b). Firewood retrieval is enhanced through increased access through off-road driving (Bate and Wisdom 2002a). Recent studies conducted in Montana and Oregon have quantified the effects of roads on snags and downed logs (Bate and Wisdom 2002a, 2002b). Only a third as many snags occurred near roads when comparing snags in roaded and un-roaded landscapes. Snag attrition was highest within 150 feet of roads and generally became insignificant beyond 600 feet, if there were no other roads in the vicinity. Effects were greater in ponderosa pine communities than in other mixed coniferous forests (Bate and Wisdom 2002a, 2002b).

Snag removal results in a reduction in the numbers of down logs in an area. Studies have found that log densities along open roads were significantly lower than densities along closed roads (Bate and Wisdom 2002b).

The loss of snags and down logs decreases the amount of habitat for denning, nesting, roosting, foraging, hiding, and thermal cover. Subsequent effects to snag-associated species would depend on a variety of factors such as the availability of habitat in the surrounding area and the degree of species mobility (Forman 1995; Forman et al. 2003).

Other indirect effects to wildlife from removal of snags and down logs include changes in ecosystem processes such as soil development and productivity, nutrient immobilization and mineralization, and nitrogen fixation. Decaying wood/down logs also set the stage for ecosystem disturbances that affect wildlife, i.e. fire, insects, and disease.

Summary of General Effects on Riparian Areas

Riparian zones occupy relatively small areas. For example, riparian areas comprise less than 0.5 percent of all land area in the Northern Region of the Forest Service (Hutto and Young 1999). These areas also incur a disproportionate amount of human activity. As such, they are vulnerable to alteration (Thomas 1979). Roads in riparian zones reduce habitat effectiveness for many wildlife species mainly through vegetation alteration and disturbance associated with human

activity (USDA 1996). Roads parallel many riparian zones and many host dispersed camping sites. While this may enhance the opportunity for the human-wildlife experience it also decreases the habitat effectiveness of the riparian area for wildlife.

Recreational use (such as camping) and firewood retrieval are the main activities facilitated by roads in and adjacent to riparian areas (see discussion above). For example, camping may result in a reduction in density and diversity of herbaceous ground cover, decline in tree vigor (usually related to soil compaction and root dieback), elimination of seedlings and young age classes of trees, and invasion of exotic species.

Background for the Cumulative Effects Analysis

The effects of past activities are summarized in the Existing Condition section for each species of concern. Additional past, present, and reasonably foreseeable projects/actions that may affect species of concern are described in Appendix D. This list and the current condition were considered in the cumulative effects analysis for each species described below. In addition to the areas of analysis for direct and indirect effects (the Payette National Forest outside of the FC-RONR Wilderness), the cumulative effects analysis area for most species included adjacent State of Idaho lands and private lands, and the FC-RONR Wilderness. More information is provided in the Wildlife Specialist Report in the Project Record.

Direct and Indirect Effects - Threatened, Endangered, Proposed, and Candidate Species

Bald Eagle

Wildlife Issue 5: Travel management may affect habitat and/or populations of threatened, endangered, and Forest Service Sensitive Species.

Indicators:

- Changes in habitat and potential effects on individuals and populations.

All Alternatives – A, B, C, D and E

The Travel Plan has limited potential to affect individual bald eagles and/or their nest sites. No roads are near to the nest site on Upper Payette Lake. In addition, the site has never been documented as occupied, probably due to the lack of open water during nesting season (C. Hescock, pers. comm.). The nest site at Lost Valley Reservoir has an established motorized closure area around it. Each of the alternatives would maintain this closure area and restrict OHV use to established motorized roads and trails. Under the action alternatives (B, C, D, and E) the closure of all areas to cross-country travel would reduce motorized disturbance and human harassment near potential nest sites and in wintering areas. The nest site in Hells Canyon occurs immediately above a paved road belonging to Idaho Power. The nest site was established after the road was in place and eagles have nested successfully for the past 3 years. The winter roost sites near Oxbow are across the river from the road. The road is not in close proximity and so does not disturb eagles at the winter roost sites. There are no trails in close proximity to the winter roosts.

Cumulative Effects

Past actions have been taken into account in the analysis of the existing condition of bald eagles on the PNF. Ongoing activities are not expected to affect bald eagles due to the localized nature of eagle use on the Forest and the ability to impose restrictions that minimize disturbance as

needed. At this time, none of the reasonably foreseeable actions are expected to affect bald eagles because all actions must be analyzed under the NEPA and suitably designed to conserve the species per the requirements of the Forest Plan (TEST12) and the ESA.

Continued and foreseeable future private land development adjacent to the PNF may cause bald eagles to shift activities onto the Forest, where possible. Such shifts are possible for nesting sites, but less likely for foraging sites since the best areas for foraging occur on waterbodies off National Forest System lands (i.e., Cascade Reservoir and Hells Canyon Reservoir). In summary, implementation of any of the action alternatives would not be cumulative to any ongoing and future actions on NFS lands and adjacent state and private lands since all Forest Service administered actions would continue to require protective measures for eagles where necessary.

Effects Determination

For the reasons stated above, any one of the alternatives for the PNF Travel Plan alternatives ***may affect, but is not likely to adversely affect bald eagles or their habitat***.

Gray Wolf

Wildlife Issue 5: Travel management may affect habitat and/or populations of threatened, endangered, and Forest Service Sensitive Species.

Indicators:

- Changes in habitat and potential effects on individuals and populations.

Introduction

Roads and trails facilitate human travel into wolf habitat, thereby increasing the potential for conflicts between wolves and humans such as disturbance of den sites, mortality associated with vehicle accidents, and increased potential for illegal shooting (Theil 1985; Mech 1989; Mech et al. 1988; Boyd and Pletscher 1999). Travel management may indirectly affect wolves through impacts to wolf prey, such as deer and elk. Because they are an important prey item, factors that affect ungulate distribution and abundance can also affect wolves.

Wolf response to human disturbance depends on a variety of factors including the setting (e.g., den site), individuality of wolves, and whether the population is exploited or protected (Mech et al. 1988). Wolf packs appear sensitive to human disturbance near den sites and may abandon the site (C. Mack, pers. comm. with A. Kuehl 2005). On the Payette National Forest, most den sites are located away from trails and backcountry campsites, so disturbance is less likely to occur. Wolves may also be sensitive to human disturbance near rendezvous sites. Wolves appear to be most sensitive to human disturbance at the first rendezvous site and become less sensitive at later sites (USDI 1987).

In general, travel management may influence wolf security and prey availability. All action alternatives for the PNF Travel Plan are unlikely to have a measurable impact on wolf populations or habitat. Wolf populations have been increasing substantially under the current Travel Plan, and action alternatives would result in greater restrictions on motorized travel.

Alternative A – No Action

Under Alternative A, approximately 511,000 acres of the Forest would remain open to cross-country motor vehicle use in summer leading to harassment, disturbance, illegally shooting and trapping. Alternative A would provide the least secure environment for wolves and their prey due

to the permitted cross-country travel. Where cross-country travel is permitted wolves are not able to become habituated to regular, predictable traffic.

While cross-country travel and roads may have localized impacts on wolves, wolf populations are expanding under the current Travel Plan. The Forest currently supports fourteen wolf packs and wolf populations have increased beyond initial projections.

Action Alternatives B, C, D, and E

Effects to wolves and wolf habitat are expected to be similar for all action alternatives. The potential for wolf mortality and harassment in all action alternatives would be lower than under Alternative A, because no cross-country travel would be allowed. Alternative C has the most roads and trails open to motorized use, which could result in potentially higher wolf and human conflicts compared to the other action alternatives. However, the open roads and motorized trails in all action alternatives would have limited effects to wolves since wolves occur on all Districts, and their numbers continue to increase.

Wolves are unlikely to be affected by potential fluctuations in prey base associated with the action alternatives. Elk behavior and vulnerability may vary slightly by action alternative (see analysis in Elk section), but overall elk security would increase because cross-country travel is prohibited. Roads and motorized trails facilitate hunting opportunities, but overall population numbers are also a result of habitat quality and quantity, hunter success, established hunting seasons and a number of uncontrollable variables such as weather. All action alternatives would continue to support elk populations (big game), thereby assuring a prey base for wolves.

Cumulative Effects

In the past, wolves were extirpated from the Payette National Forest. Wolves have reestablished territories throughout the Forest. Past actions have been taken into account in the analysis of the existing condition of wolves on the PNF -- in short the effects of past actions have been overcome by reintroduction and protection of wolf populations in Idaho. Most ongoing activities (Appendix D) managed by the PNF are not expected to have measurable impacts on wolves since wolves are wide ranging species whose populations are expanding under these current activities. Livestock grazing is one activity managed by the Forest where certain practices may reduce wolf predation on domestic livestock. Forest rangeland managers work with permittees to implement such practices.

Future Forest Service actions would be analyzed under the National Environmental Policy Act (NEPA) and required to provide suitable conservation of wolves, since populations in Idaho are currently protected under the Endangered Species Act (ESA). Even if wolf populations in Idaho are delisted from ESA, long-term conservation measures are likely to be required as part of the delisting.

Activities outside the control of the Forest Service are impacting wolf populations and would be cumulative to any slight effects associated with the selected alternative for the Travel Management Plan. Alternatives B and D would result in slightly lower motorized route densities, and would therefore be less likely to contribute to cumulative effects with ongoing and future actions by other entities, such as mortality associated with livestock depredation, illegal killing, and vehicle collisions. These outside activities are likely to continue to occur at levels sufficient to limit the distribution and population size of wolves. The Forest would continue to support wolf packs under all alternatives.

Continued private land development may affect wolves by increasing the likelihood wolves would be harassed, disturbed, illegally shot, or trapped. The chance of vehicle collisions would

also increase as adjacent private lands are developed and roaded. Livestock predation and other wolf/human conflicts are likely to increase as the wolf populations begin to reach carrying capacity on the Forest. Wolves are still in the process of re-establishing across the landscape; as such, past and ongoing adjacent private and other actions are not expected to strongly affect wolves at this time. Wolf predation on livestock and the subsequent removal or killing of the wolves as allowed by State and Federal law would have the greatest effects on wolf populations on the PNF.

Effects Determination

Based on the discussion of direct, indirect, and cumulative effects presented above, all proposed Travel Plan alternatives ***may affect gray wolves***. Action alternatives B, C, D, and E would improve wolf habitat by eliminating motorized cross-country travel. Alternative C would increase the area open to over-snow travel which may slightly increase disturbance to wolves and their prey. ***None of the action alternatives would jeopardize the continued existence of the gray wolf.***

Northern Idaho Ground Squirrel

Wildlife Issue 5: Travel management may affect habitat and/or populations of threatened, endangered, and Forest Service Sensitive Species.

Indicators:

- Changes in habitat and potential effects on individuals and populations.

Introduction

During consultation with USFWS on the Biological Assessment for the FEIS, additional concerns were raised about the impact of roads and motorized trails on the northern Idaho ground squirrel (NIDGS). In response to those concerns, additional analysis was added to this FEIS and documented in the BA. Changes in NIDGS habitat and potential effects on individuals and populations were analyzed by looking at cross-country travel, roads and motorized trails in NIDGS sites by alternative.

Alternative A – No Action

Cross-country motor vehicle use can detrimentally impact northern Idaho ground squirrel habitat through soil compaction and removal of vegetation and can physically harm or take northern Idaho ground squirrel individuals through collisions and illegal shooting.

There would be no impacts to occupied NIDGS sites from motorized cross-country travel, because all known sites are closed to this travel. Unoccupied suitable habitat may continue to be impacted by cross-country travel motor vehicle travel that destroys vegetation and compacts soil. If portions of the west side of the Forest remain open to motorized cross-country travel, enforcement of closures of known sites would remain difficult because people often claim they were unaware of the closure area or were unsure of the boundaries. In addition, unknown populated sites would not be protected and may be impacted by continued motorized cross-country travel.

Alternative A would continue to allow travel on approximately 6 miles of open NFS roads and motorized trails adjacent to occupied NIDGS habitat. Currently, sixteen occupied sites and one unoccupied NIDGS site are adjoined or bisected by open roads or motorized trails under the jurisdiction of the Payette National Forest. Three of these occupied sites are also bisected by county roads. An additional six occupied sites are bisected by roads under county or private

jurisdiction (Wildlife BA, Project Record). Roads in the vicinity of NIDGS colonies can result in harm or take primarily due to vehicle collisions. Access into NIDGS colonies also allows more opportunities for illegal shooting.

Alternative A is the least effective alternative for protecting northern Idaho ground squirrel populations and habitat, because, in allows cross-country travel within the range of the NIDGS and continues to allow travel on 6 miles of roads and motorized trails within NIDGS occupied sites.

Action Alternatives – B, C, D, and E

Each of the action alternatives prohibits cross-country motor vehicle use over the entire Forest. Occupied NIDGS sites are currently closed to off-road travel, but the action alternatives provide additional protection to sites that are occupied, but have not yet been discovered. These alternatives would make travel management and enforcement easier because there would be less confusion as to where cross-country motor vehicle use is allowed. These alternatives also protect currently unoccupied suitable habitat from motorized cross-country travel.

Cross-country motor vehicle use can detrimentally impact northern Idaho ground squirrel habitat through soil compaction and removal of vegetation and can physically harm or take northern Idaho ground squirrel individuals through collisions and illegal shooting. The action alternatives close all occupied habitat to this off-road activity, thereby reducing potential effects to NIDGS to negligible levels.

Off-road travel would only be allowed to park vehicles one vehicle length from the road or to access dispersed campsites within 300 feet of either side of an open road and 100 feet on either side of a trail, but no off-road travel would be allowed for any reason in occupied NIDGS habitat.

Yearly monitoring of occupied NIDGS sites would occur to ensure compliance with the off-road travel restrictions. If illegal off-road travel occurs in occupied habitat, measures would be taken to physically barricade the area to such travel. Monitoring would also be used to identify newly occupied NIDGS habitat. These areas would be added to the Forest's Motor Vehicle Use Map and closed to all off road travel for parking or access to dispersed camping.

Roads and motorized trails in the vicinity of NIDGS colonies can result in harm or take primarily due to vehicle collisions. Access into NIDGS colonies also allows more opportunities for illegal shooting. Under all alternatives, the 6 miles of road within occupied NIDGS sites would not change. The miles of motorized trails would remain the same (0.2 miles) in alternatives B, D, and E, but would increase to 0.23 miles in Alternative C.

All alternatives include mitigation measures to reduce the effects from existing roads and motorized trails. These measures include signing along roads near NIDGS colonies to educate the public on the presence of squirrels and the requirement to drive slowly to avoid collisions. Effects would be minimized, but would not be reduced to negligible.

Over time, the PNF would work with the USFWS to identify additional measures to reduce the harm to NIDGS from existing roads and motorized trails. These measures could include speed limits, road realignments, and road closures. Closure of some roads would be difficult because they are major access routes across the Payette National Forest. Realignment of these roads would provide only temporary benefits if the area where the road could be moved is potential NIDGS habitat.

Cumulative Effects

The effects of past actions (see Appendix D) have been taken into account in the analysis of the existing condition for this species on the PNF. Ongoing activities administered by the Forest Service are not expected to further affect northern Idaho ground squirrels due to the Forest Service's ability to impose restrictions that minimize disturbance as needed. No reasonably foreseeable actions conducted by the PNF are expected to negatively affect NIDGS because all actions must be analyzed under the National Environmental Policy Act (NEPA) and suitably designed to conserve the species per the requirements of the Forest Plan (TEST12) and ESA.

Ongoing actions are listed in Appendix D and have incorporated protective measures for NIDGS. Existing restrictions do not allow firewood gathering in occupied NIDGS sites. Additional access for firewood gathering would be subject to similar restrictions. The Forest Service is in the process of assessing the merits of the conveyance of several FRTA easements for roads to local counties. Such conveyances should be considered and analyzed carefully (under NEPA) if the roads occur within occupied NIDGS, because the ESA provides stronger protection measures to listed species from federal actions compared with state or private actions. The ongoing Bear Tornado Recovery Project was designed to avoid impacts to NIDGS.

The Lick Creek Vegetation Management Project, Summit Gulch Vegetation Management Project, Muddy Squirrel Project, East Fork Lost Creek NIDGS Habitat Improvement Project, and Warm Springs Fuels Reduction are all ongoing or reasonably foreseeable actions designed to restore northern Idaho ground squirrel habitat.

Past actions on private land impacted northern Idaho ground squirrels through direct killing of squirrels and removal of habitat. Based on consultation with the USFWS, ongoing and foreseeable future private land development could affect the species through development of suitable, but unoccupied habitat. In occupied habitat, ESA requirements generally result in development of protective measures (such as Safe Harbor Agreements and Habitat Conservation Plans) in consultation with the landowner. Lands administered by the Idaho Department of State Lands adjoin the Payette National Forest and provide unoccupied and occupied habitat for NIDGS. ESA requirements should result in agreements with the State of Idaho to protect occupied NIDGS sites, but no such agreements have been made to date. Without these protective agreements, activities by state, county, and private entities may have cumulative negative impacts across the range of the NIDGS, despite the measures the PNF undertakes to protect NIDGS on NFS lands. In relation to the Travel Plan action, about 4.5 miles of road that are under jurisdiction by the county or private entities adjoin or bisect NIDGS sites.

In summary, any one of the action alternatives for the Travel Plan would minimize effects to NIDGS, but would not reduce these effects to negligible. In combination with past, ongoing, or reasonably foreseeable actions on NFS neutral or positive effects are likely in the long term due to closure of the PNF to cross-country motor vehicle use in combination with ongoing protection required by the Forest Plan, and foreseeable actions in vegetation management projects that are designed to improve NIDGS habitat. When combined with cumulative effects on private and state lands, effects may be negative unless protective agreements are put into place for the northern Idaho ground squirrel.

Effects Determination

For the reasons stated above, any one of the alternatives is ***likely to adversely affect northern Idaho ground squirrel*** and their habitat.

Canada Lynx

Wildlife Issue 2: Motorized travel may affect Canada lynx habitat during summer and winter.

Indicators – Summer:

- Density of roads and motorized trails within lynx habitat.

Indicators – Winter:

- Acres open and closed to over-snow vehicle use in lynx habitat.
- Miles of groomed snowmobile routes within lynx habitat.
- Effects of over-snow vehicle use on habitat connectivity.

Roads, Trails, and Motorized Access in Summer

There is little information on the effects of roads and trails on lynx or their prey (Apps 2000; McKelvey et al. 2000). Construction of roads may remove lynx habitat; conversely, lynx may use less-traveled roads for travel and foraging if vegetation conditions provide good snowshoe hare habitat. Preliminary information indicates that lynx do not avoid roads except those with high traffic volume (Aubry et al. 2000; Ruggerio et al. 2000a) or when road use coincides with sensitive habitat such as denning habitat (Ruggerio et al. 2000b).

The likelihood of lynx encountering people has dramatically increased over the last few decades because of elevated levels of human access into lynx habitat. Roads and trails, snowmobiles, off-road vehicles, and ski area developments enable human access into historically remote forests, thereby increasing the likelihood of lynx being displaced from otherwise suitable habitats and increasing the vulnerability of lynx to human-induced mortality (Brittell et al. 1989; Koehler and Brittell 1990). Roads may also increase the vulnerability of lynx to hunters and trappers (Koehler and Aubry 1994).

Lynx avoid open areas and use mature forest or forest with dense cover, tall shrubs, and well-vegetated riparian areas as travel corridors. Lynx will use some types of roads for hunting and travel down old roads less than 50 feet wide with good cover along both edges (Koehler and Brittell 1990) and cross openings less than approximately 300 feet in width (Koehler and Aubry 1994). However, roads may disrupt lynx travel and hunting patterns. Koehler and Aubry (1994) concluded road construction and maintenance are important components of lynx habitat management because they both destroy and create prey habitat, but also make lynx more vulnerable to human-caused mortality.

The PNF Forest Plan (Forest Plan 2003) does not include direction for road densities in relation to lynx habitat. The Lynx Conservation and Assessment Strategy (LCAS) recommends prioritizing roads for closure or seasonal restrictions in lynx habitat where road densities exceed two miles per square mile, but the Fish and Wildlife Service has concluded that roads, even with high traffic volume, constitute a low threat to lynx populations (USDI 2003).

In all alternatives, in all LAUs, the densities of open motorized routes are less than 2.0 miles/square mile (Wildlife Specialist Report: Project Record). The most additional roads and motorized trails (33 miles) are proposed in Alternative C including about 6 miles along the West Mountain ridgeline above Lake Cascade. Alternative E would reduce open roads and motorized trails compared with the existing condition, but would include the ATV trail along the West Mountain ridgeline. This additional trail would be least desirable, since ridgelines are important travel corridors for not only lynx, but many species of wildlife. In all action alternatives, the areas open to cross-country travel would decrease substantially. These closures to off-road travel are expected to benefit lynx habitat.

Refugia

Research suggests that local refugia are critical for successful lynx reproduction and fitness (Ruediger et al. 2000). "Refugia" are large areas of high quality habitat relatively secure from human exploitation, habitat degradation, and disturbance. The minimum size of refugia for lynx is unknown, but a study in north-central Washington found that a 448,000-acre area is sustaining lynx populations (Koehler 1990), but this area is also connected to lynx habitat and populations in Canada.

The PNF has large blocks of relatively undisturbed areas or potential "refugia" in the Inventoried Roadless Areas (IRAs). All 22 IRAs on the PNF contain potential lynx habitat. About 69 percent (638,900 of 926,600 acres) of potential lynx habitat in the project area occurs in IRAs. However, 586,000 acres of the IRAs are currently open to over-snow travel and approximately 31 miles of groomed snowmobiles routes occur in two IRAs (French Creek 16.3 miles and Patrick Butte 14.7 miles). This reduces the effectiveness of IRAs as refugia for lynx in winter.

Lynx are not known to inhabit the PNF, so the ability of IRAs to provide undisturbed lynx habitat to maintain lynx populations cannot be measured. However, IRAs are considered important refugia for any lynx that may be present on the Forest.

Cumulatively, additional refugia are provided outside the Travel Plan project area in the FC-RONR Wilderness. The wilderness contains 770,700 acres of LAUs with 488,700 acres of potential lynx habitat. No snowmobile use is allowed in the wilderness.

Habitat Connectivity

Habitat connectivity is also an important component of habitat conservation for lynx, as well as many other wildlife species (see general discussion above). Providing for habitat connectivity in order to promote wildlife movement and genetic interaction would also benefit lynx populations by maintaining secure habitat in dispersal routes used by juvenile animals and for breeding activities. Areas with high road densities and/or human use patterns can interrupt habitat connectivity and fragment lynx habitat (Ruediger et al. 2000). The LCAS discourages the building of motorized routes on ridge tops as this might interfere with lynx habitat connectivity. Forest Plan direction on this topic is broader (TEOB30) and states: "Manage recreational activities to maintain lynx habitat and connectivity."

Five habitat corridors potentially important for habitat connectivity were identified in the project area (see Figure W-1). These corridors largely follow ridge tops. Three corridors run parallel to one another from north to south: the Big Creek corridor, Needles to Marshall Mountain corridor, and Slab Butte to Patrick Butte corridor. Two corridors, called the FC-RONR Wilderness to Hell's Canyon North and South corridors, run east to west across the PNF.

In summer, impacts to these corridors are relatively low because these areas generally have low road densities. No new roads or trails on ridge tops are proposed in alternatives B or D. Alternatives C and E would add a six mile long ATV trail along a ridgeline on the Council Ranger District in MA 3 that bisects lynx habitat (but not one of the four main corridors). This new trail would increase access into lynx habitat, but does not substantially change the density of roads and motorized trails. Alternative C would cause a slight increase in human disturbance in lynx habitat in summer. Negative impacts to habitat relative to open routes would be higher than any of the other alternatives considered.

In winter, alternatives A, B, C, D, and E provide varying levels of protection of habitat connectivity from over-snow vehicle use. Alternative D provides the greatest protection by decreasing the number of acres open to motorized use in lynx habitat winter from 687,500 to 533,100 acres. Alternative E also provides a substantial amount of protection by decreasing open

areas in lynx habitat from 687,500 acres to 607,700 acres. Alternative D and E specifically respond to Forest Plan direction which states: *During mid or project scale analysis, identify and prioritize opportunities for restoration of habitat linkage zones to promote genetic integrity and species distribution* (TEOB09), and *Manage recreational activities to maintain lynx habitat and connectivity* (TEOB30).

Maps that display this additional protection are provided in Figures W-1 and W-2. Additional analysis and discussion of the effects of habitat connectivity in winter is provided below and in the wolverine analysis.

Snow Compaction

Increases in winter access into lynx habitat have increased the vulnerability of lynx to harvest in areas historically isolated from humans (Todd 1985). Lynx are particularly easy to capture by trapping (Bailey et al. 1986; Mowat et al. 1999), and trapping can be a major cause of lynx mortality.

Some researchers maintain winter activities, (e.g. cross-county skiing, snowmobiling) can compact snow allowing other predators that compete with lynx to access lynx habitat (Claar et al. 1999; Bunnell et al. 2006). Lynx appear to have evolved a competitive advantage in deep snow that tends to exclude other predators during winter, a time when prey is most limiting (Buskirk et al. 2000; Ruediger et al. 2000). Other researchers note there is no solid data on the role of snow compaction and changes in competitive advantage between lynx and other species (Kolbe in prep).

In a review of potential threats to lynx (USDI 2003), the Fish and Wildlife Service concluded: "*There is no evidence that any competition that may exist between lynx and other species exerts a population-level impact on lynx*." and "*No evidence has been provided that packed snow trails facilitate competition to a level that negatively affects lynx*." Research in western Montana appears to support this contention, finding that: "The overall influence of snowmobile trails on coyote movements and foraging success during winter appeared to be minimal on our study area (Kolbe et al. in prep.). Other research in Utah arrived at differing conclusions (using different methodology) stating: "Our results suggest that restrictions placed on snowmobiles in lynx conservation areas by land management agencies because of potential impacts of coyotes may be appropriate." (Bunnell et al. 2006). The Forest Plan (2003a) adopted the LCAS standard for snow compaction (TEST34) that states:

> *Allow no net increase in groomed or designated over-the-snow routes or play areas, outside of baseline areas of consistent snow compaction, by LAU or in combination with immediately adjacent LAUs unless the Biological Assessment demonstrates the grooming or designation serves to consolidate use and improve lynx habitat…. Also, permits, authorizations or agreements could expand into baseline routes and baseline areas of existing snow compaction, and grooming could expand to routes of existing snow compaction and routes that have been designated but not groomed in the past and still comply with this standard. (USDA Forest Service 2003a)*

Due to the recent conflicting evidence on the need for this standard, the analysis for the PNF Travel Plan considered whether the standard should be modified or dropped. After consultation with USFWS, it was determined that the Forest lacks the data to support any substantial changes to lynx management, including Forest Plan direction for lynx, at this time. The analysis for the Northern Rockies Lynx Amendment also considered this issue and retained this standard as a guideline in the preferred alternative (T. Bertram pers. comm. 2007).

Figure W-1. Projected Wildlife Travel Corridors in Winter for Alternative D

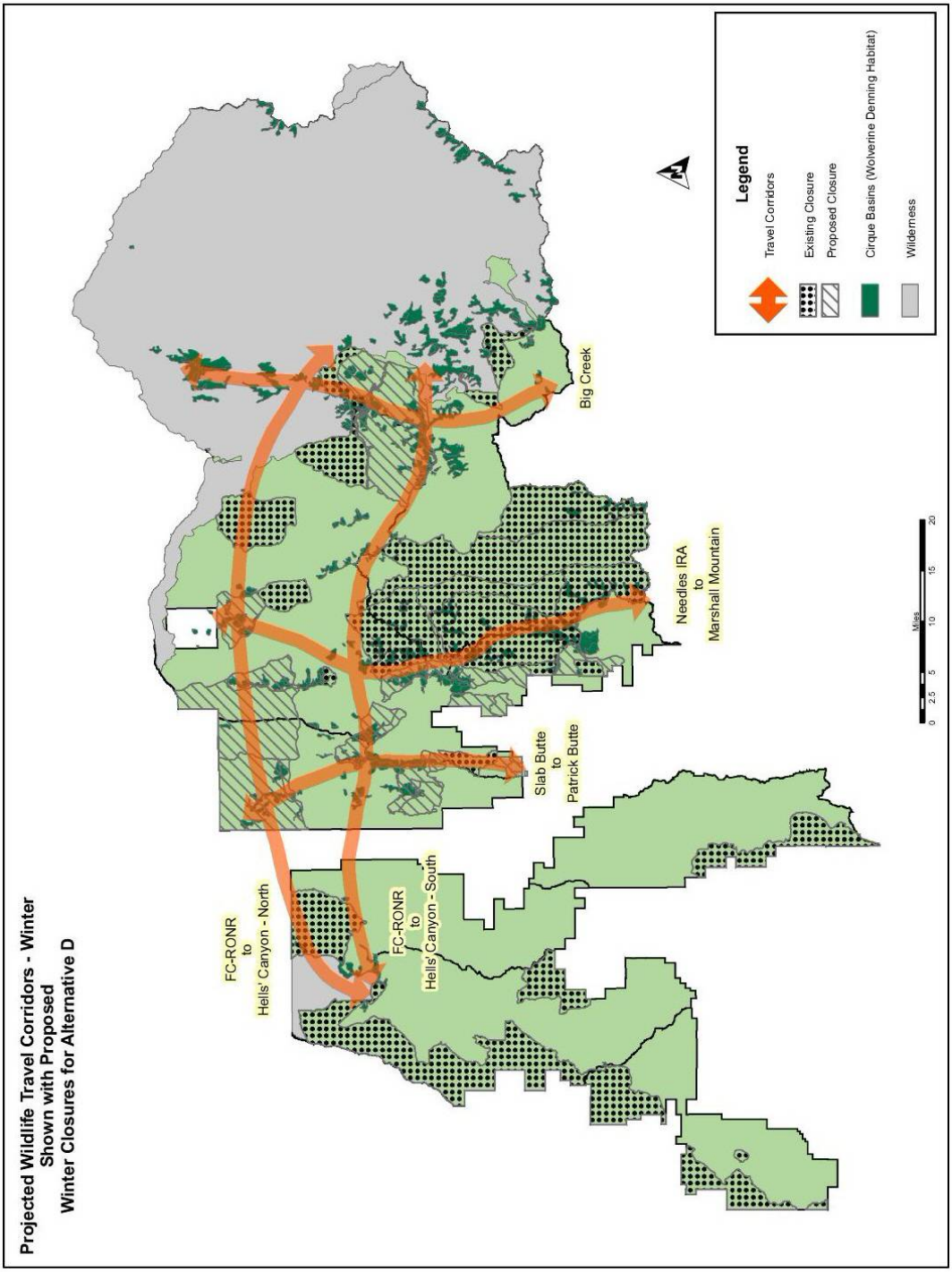
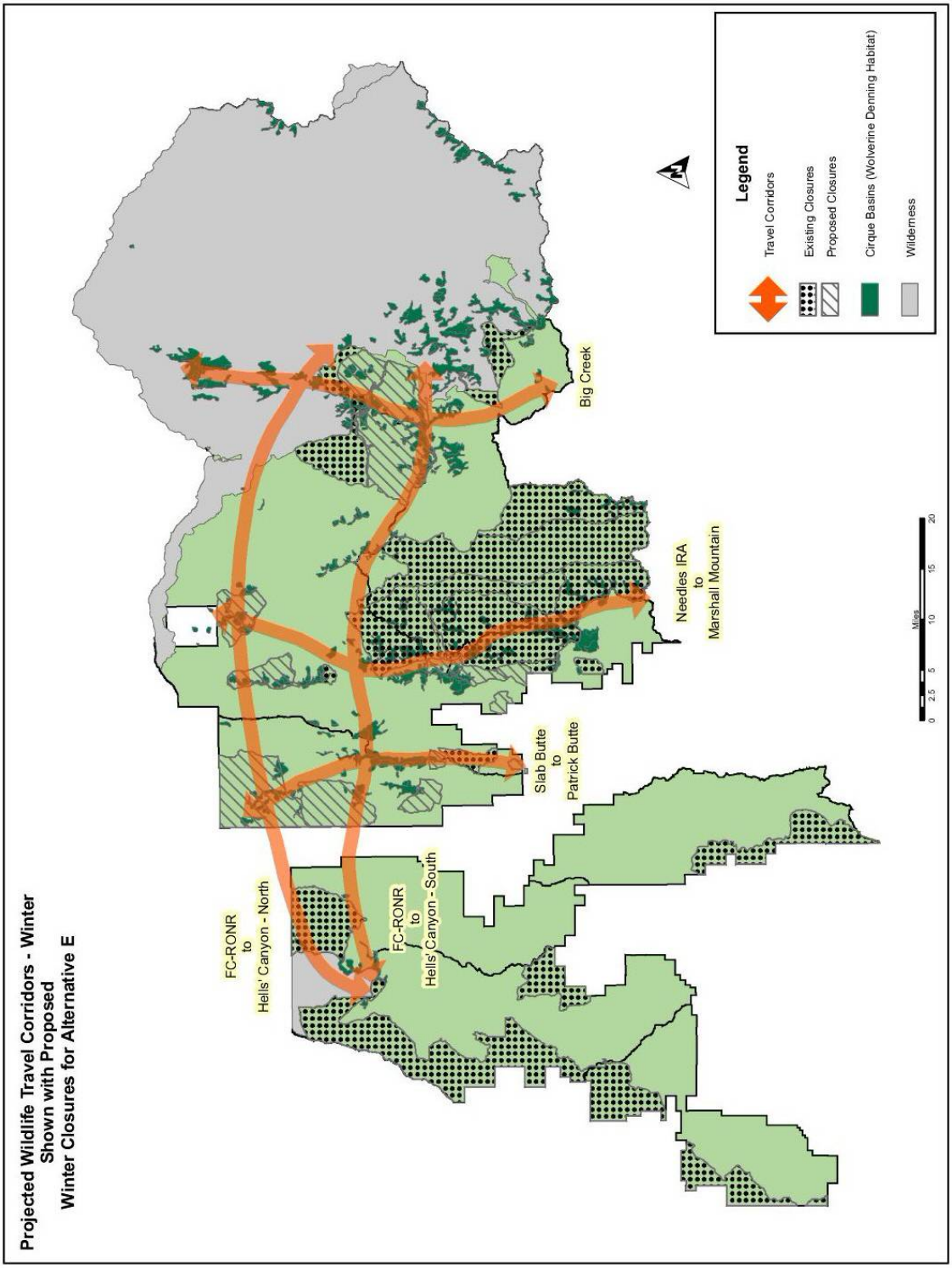


Figure W-2. Projected Wildlife Travel Corridors in Winter for Alternative E



The PNF plans to use the expertise of the Lynx Biology Team and the USFWS to revaluate lynx habitat and LAUs on the Forest. The PNF also plans to implement surveys for lynx (see monitoring section in Chapter 2). Following these efforts, the PNF standard (TEST34) may be reevaluated.

The PNF has no designated over-snow routes other than groomed snowmobile trails. The PNF has no designated "play areas." Although not designated and hard to identify, the Forest does have many miles of over-snow routes and acres of areas open to over-snow travel in lynx habitat.

The other indicator tracked is: **change in miles of groomed snowmobile trails in lynx habitat by LAU.** The analysis of this indicator takes into account not only the change by LAU, but also changes by combinations of adjacent LAUs. In addition, this analysis considers changes due to grooming of routes and areas of "existing snow compaction."

As directed by the Forest Plan (TEST34), alternatives B, D, and E would not result in a net increase in groomed or designated over-the-snow routes or play areas, outside of baseline areas of consistent snow compaction. However, Alternative C proposes to open approximately 59,000 acres that are currently closed to over-snow vehicle use in lynx habitat for a total of about 746,500 open acres or about 81 percent of the lynx habitat on the PNF outside of designated Wilderness. Hence, Alternative C would expand open areas and snow compaction in lynx habitat. Newly opened areas under Alternative C would not meet Forest Plan direction except for the proposed opening of 765 acres in the Sturgill Peak area that are outside of an LAU. In order for this aspect of Alternative C to be consistent with the Forest Plan, other areas must be closed to over-snow use (as proposed in alternatives B, D, or E). Without other area closures, an amendment to the Forest Plan would be necessary

Table W-4 displays the potential routes (miles) and acres open to motorized over-snow use for each alternative for lynx habitat in all LAUs (outside of wilderness) combined. Alternatives B, D, and E reduce the open acres by approximately 12,500 acres, 154,500 acres, and 79,900 acres, respectively. Both Alternative D and Alternative E specifically address the need for corridors for habitat connectivity in winter (see discussion above and in wolverine section). Alternative D best addresses the need, but Alternative E also provides reasonable protection of the corridors. Alternative C would not meet standard TEST34 of no net increase in play areas (areas open to over-snow vehicle use) because about 58,900 additional acres in lynx habitat would be opened.

Table W-4. Change in Miles of Groomed Routes and Areas Open and Closed to Over-snow Vehicle Use in Lynx Habitat on the PNF (outside of the FC-RONR Wilderness) for each Travel Plan Alternative

Alternative	Miles of Groomed Snowmobile Routes	Acres Open to Over-snow Vehicle Use (percent of area)	Acres Closed to Over-snow Vehicle Use	Total Acres Lynx Habitat
A	137	687,500 (74%)	239,000 (26%)	926,500
B	129	675,100 (73%)	251,500 (27%)	926,500
C	137	746,500 (81%)	180,000 (19%)	926,500
D	129	533,100 (58%)	393,500 (32%)	926,500
E	137	607,700 (66%)	318,800 (34%)	926,500

Change in areas open to over-snow vehicle use in lynx habitat by LAU by alternative is shown in Table W-5. Alternative C is non-compliant with TEST34 because of increases in motorized over snow areas in five LAUs. In addition, the increases in open areas (play areas) in five LAUs in Alternative C cannot be offset by consideration of combinations of immediately adjacent LAUs.

Non-compliance would also occur in one LAU in Alternative E , but overall Alternative E would close an additional 79,900 acres in lynx habitat compared with baseline (the No Action Alternative). This increase, when viewed in context of adjacent LAUs, is considered consistent with the Forest Plan because TEST34 allows for the evaluation of combinations of LAUs:

> *Allow no net increase in groomed or designated over-the-snow routes or play areas, outside of baseline areas of consistent snow compaction, by LAU or in combination with immediately adjacent LAUs.*

An increase of 16,754 acres open in the Warren LAU should be considered in context with closures in the immediately adjacent LAUs: Upper Sesech – 5,885 acres closed, California-Bull – 2,692 acres closed, Lower Secesh – 1,563 acres closed, Middle South Fork Salmon – 23,045 acres closed. Closures in lynx habitat in these adjacent LAUs total more than 33,000 acres meeting Forest Plan direction, including TEST34.

Although the total miles of groomed routes on the PNF would not increase above the baseline, routes in the Hazard Creek and Middle Forest Weiser LAUs would increase above baseline in alternatives C and E. Table W-6 displays the potential groomed routes in lynx habitat by LAU (rounded to the nearest mile). The Hazard Creek LAU is directly adjacent to Goose Creek LAU. When the two LAUs are evaluated together, the miles of groomed route would not surpass the baseline (Table W-7). This is also the case when the Middle Fork Weiser and Northwest Council LAUs are evaluated together (Table W-7). Forest Plan standard TEST34 allows for the evaluation of a combination of adjacent LAUs (see above).

Table W-5. Change in Acres Open to Over-snow Vehicle Use in Lynx Habitat by LAU (Outside of Wilderness) by Alternative

LAU_ID	LAU_NAME	ALT_A		ALT_B		ALT_C		ALT_D		ALT_E		ACRES lynx habitat
		Open	Closed	Open	Closed	Open	Closed	Open	Closed	Open	Closed	
1	Granite	6,434	7,456	6,434	7,456	6,434	7,456	6,434	7,456	6,434	7,456	13,890
2	Rapid River	23,449	15,300	23,449	15,300	23,449	15,300	23,449	15,300	23,449	15,300	38,749
3	Lower Little Salmon	12,920	1	12,920	1	12,920	1	1,737	11,184	355	12,566	12,921
4	Boulder	27,532	70	27,532	70	27,532	70	27,532	70	27,532	70	27,602
5	Partridge-Kelly	20,339	0	20,339	0	20,339	0	10	20,330	9,522	10,818	20,339
6	Hazard Creek	34,351	0	32,277	2,075	32,277	2,075	29,859	4,493	23,882	10,469	34,351
7	Goose Creek	21,479	3,049	18,101	6,427	18,995	5,534	12,562	11,966	17,676	6,852	24,528
8	Northwest Council	18,372	117	18,372	117	18,372	117	18,372	117	18,372	117	18,489
9	Middle Fork Weiser	20,422	510	20,422	510	20,422	510	20,422	510	20,422	510	20,932
10	Little Weiser	14,132	1,631	14,132	1,631	14,132	1,631	14,132	1,631	14,132	1,631	15,763
11	Fall-Johnson	17,141	0	17,141	0	17,141	0	11,282	5,859	16,938	202	17,141
12	French Creek	34,519	0	34,519	0	34,519	0	18,646	15,872	34,020	499	34,519
13	Upper North Fork Payette	56,771	3,730	56,743	3,758	57,081	3,421	41,607	18,894	55,364	5,137	60,501
14	Lake Fork	7,445	17,952	2,044	23,352	9,552	15,845	1,883	23,513	2,044	23,352	25,397
15	Kennally Creek	25,324	1,769	25,324	1,769	25,328	1,765	20,923	6,170	25,324	1,769	27,093
16	No Name	2	0	2	0	2	0	2	0	2	0	2
17	California-Bull	24,326	2,086	24,326	2,086	26,412	0	19,548	6,864	21,634	4,778	26,412
18	Upper Secesh	70,647	10,602	70,647	10,602	78,884	2,365	57,173	24,076	64,762	16,487	81,249
19	Lower Secesh	11,808	38,877	10,245	40,440	15,072	35,612	10,244	40,440	10,245	40,440	50,685
20	Buckhorn-Fitsum	9	33,329	9	33,329	7,591	25,746	8	33,329	9	33,329	33,338
21	Blackmare-Fourmile	40	41,225	40	41,225	15,424	25,841	40	41,225	40	41,225	41,264
22	Warren	31,620	16,754	31,620	16,754	48,374	0	31,620	16,754	48,374		48,374
23	Lower South Fork Salmon River	16,307	6,216	16,307	6,216	16,339	6,184	16,307	6,216	16,339	6,184	22,523
24	Middle South Fork Salmon River	48,626	2,460	48,626	2,460	48,626	2,460	24,928	26,158	25,581	25,505	51,086
25	Lower EFSF Salmon River	6,561	7,335	6,561	7,335	13,832	64	6,561	7,335	6,561	7,335	13,896
28	Beaver-Gold	0	0	0	0	0	0	0	0	0	0	0
29	Upper Big Creek	20,913	5,475	20,913	5,475	20,913	5,475	1,777	24,611	2,308	24,080	26,388

LAU_ID	LAU_NAME	ALT_A		ALT_B		ALT_C		ALT_D		ALT_E		ACRES lynx habitat
		Open	Closed	Open	Closed	Open	Closed	Open	Closed	Open	Closed	
30	Stibnite	40,962	7,729	40,962	7,729	40,962	7,729	40,953	7,737	40,953	7,737	48,690
37	Monumental	3,234	0	3,234	0	3,234	0	3,234	0	3,234	0	3,234
39	Upper Middle Fork Salmon River	745	0	745	0	745	0	745	0	745	0	745

The additional two miles of trail (above baseline) proposed in the Warren LAU occur in an area of existing snow compaction. This is also allowed in Forest Plan standard TEST34, which states:

> *Also, permits, authorizations or agreements could expand into baseline routes and baseline areas of existing snow compaction, and grooming could expand to routes of existing snow compaction and routes that have been designated but not groomed in the past and still comply with this standard.*

Table W-6. Change in Miles of Groomed Routes in Lynx Habitat by LAU on the PNF for each Travel Plan Alternative

		Miles of Groomed Routes				
LAU ID #	LAU NAME	ALT A	ALT B	ALT C	ALT D	ALT E
7	Goose Creek	28	27	27	27	27
6	Hazard Creek	14	14	15	14	15
10	Little Weiser	16	16	16	16	16
9	Middle Fork Weiser	21	18	23	18	23
8	Northwest Council	12	9	9	9	9
13	Upper North Fork Payette	30	28	26	28	26
18	Upper Secesh	14	14	14	14	14
22	Warren	4	4	6	4	6
	Total Miles	137	129	137	129	137

Table W-7. Change in Miles of Groomed Routes in Lynx Habitat in combination by adjacent LAUs for each Travel Plan Alternative

		Miles of Groomed Routes				
LAU ID #	LAU Combinations	ALT A	ALT B	ALT C	ALT D	ALT E
6 & 7	Hazard Creek & Goose Creek	42	41	42	41	42
10	Little Weiser	16	16	16	16	16
8 & 9	NW Council & Middle Fork Weiser	33	27	32	27	32
13	Upper North Fork Payette	30	28	26	28	26
18	Upper Secesh	14	14	14	14	14
22	Warren	4	4	6	4	6
	Total Miles	137	129	137	129	137

Summary of Effects

Based upon the current and historic status of lynx in Idaho, there is a low probability of lynx occurrence on the Forest. The alternatives considered for the PNF Travel Plan would have a limited effect on potential lynx or lynx habitat during snow-free months. Alternative A allows cross-country OHV travel unless otherwise designated. Alternatives B, C, D, and E provide substantially greater protection of lynx habitat than the No Action Alternative since they do not allow cross-country motorized travel.

Alternative C allows for increases in over-snow vehicle use (by 58,900 acres) that may impact lynx habitat and would not meet Forest Plan direction for lynx conservation (TEST34). In Alternative E, an increase of 16,754 acres open in the Warren LAU is acceptable when considered in context with 33,000 acres of additional closures in the immediately adjacent LAUs.

Although some research may not fully support the need for Forest Plan standard TEST34 (USDI 2003), there is also conflicting research (Bunnell 2005) and no substantial evidence to support

changing the standard. In the preferred alternative for the Northern Rockies Lynx Amendment, this standard is retained as a guideline (T. Bertram pers. commun. 2007).

The PNF standard (TEST34) will be evaluated over time, in combination with additional surveys to determine if lynx actually occur on the Forest. The PNF plans to use the expertise of the Lynx Biology Team and the USFWS to revaluate lynx habitat and LAUs on the Forest. Until these efforts are accomplished, the Forest lacks the data to support any substantial changes to lynx management, including Forest Plan direction for lynx. In addition, the need for greater protection of some wildlife habitats to over-snow motorized use is supported by the analysis of habitat connectivity for wolverine (see discussion below).

Alternatives B, D, and E improve conditions for lynx habitat in winter. Alternative D would provide the largest protection of habitat connectivity through closures of about 155,000 more acres in lynx habitat than Alternative A to over-snow vehicle use. While Alternative E closes fewer acres to over-snow use than Alternative D, the alternative was designed to both protect habitat connectivity and open some desirable areas for over-snow motorized use, while still meeting Forest Plan direction for lynx habitat (TEST34).

Alternative A – No Action

Roads and Trails:

- No change in the miles of roads and motorized trails in lynx habitat.
- No change in road densities. Current road densities in lynx habitat by LAU are low (generally less than 1 mile per square mile). No density exceeds 2 miles per square mile for any LAU.
- Any current effects from open roads and/or open areas would continue such as potential displacement of lynx and disruption of lynx travel and hunting patterns.

Refugia and Connectivity:

- Cross-country motor vehicle use would continue in areas currently open. Most of the areas open to cross-country travel are in lower elevations not normally used by lynx.
- All IRAs on the Forest contain lynx habitat. About 69 percent (638,900 of 926,600 acres) of the lynx habitat occurs in IRAs. While 14 of the IRAs have roads or motorized trails, road densities are low and thereby provide a relatively low disturbance environment.
- Projected corridors for habitat connectivity largely overlap with the IRAs. In summer, habitat connectivity should be sufficient to allow for potential lynx movements especially within the eastern portion of the Forest.
- Projected corridors for habitat connectivity may not be sufficient in winter months.
- No change to lynx travel corridors in riparian areas.

Snow Compaction:

- Currently, grooming occurs on 137 miles of snowmobile trails in lynx habitat in all LAUs. The total miles approved for grooming (based on consultation on the effects to lynx completed in 2000) is 144 miles. This is the baseline against which the “no net increase” is measured.
- No changes in areas open to snow compaction. Current increasing trends in winter use and snow compacting activities in open areas in lynx habitat would continue.

Alternative B

Roads and Trails:

- Slight decrease in roads and motorized trails in lynx habitat resulting in a slight decrease in human disturbance in lynx habitat.

- No change in road densities. Current road densities in lynx habitat by LAU are low (generally less than 1 mile per square miles). No density exceeds 2 miles per square mile for any LAU.

Refugia and Connectivity:

- Cross-country motor vehicle use would be prohibited. This would improve security and reduce the potential for disturbance within lynx habitat for lynx and lynx prey.
- Refugia would continue to be provided within the IRAs on the Forest. Few changes in the miles of roads or trails within IRAs results in effects similar to Alternative A.
- In summer, projected travel corridors for habitat connectivity would benefit relative to Alternative A due to proposed closure of areas to off-road or trail use.
- In winter, lynx habitat and habitat connectivity benefit due to an additional 12,500 acres in lynx habitat closed to over-snow motorized use. Alternative B would not adequately ensure protection of the five main projected corridors on the Forest.
- Riparian area corridors that may be used for travel by lynx would be improved because of the limits on motorized cross-country travel.

Snow Compaction:

- A slight reduction in groomed snowmobile routes in lynx habitat from 137 miles to 129 miles with minor potential benefits.
- Closes an additional 12,500 acres to over-snow motorized use in lynx habitat. This would decrease areas subject to snow compaction and potentially decrease interference from other carnivores in lynx habitat. This would meet Forest Plan direction for no increase in play areas to minimize snow compaction.

Alternative C

Roads and Trails:

- Slight increase of roads and motorized trails in lynx habitat resulting in a potential slight increase in human disturbance in lynx habitat.
- About six new miles of motorized trail designation is proposed along a ridge between Tamarack Resort and Council. The LCAS discourages the building of new roads on ridge tops as this might interfere with lynx habitat connectivity although there is no specific standard. Ridgelines and riparian areas are used extensively as travel corridors not only for lynx but many other species of wildlife such as wolverine.
- Road densities in lynx habitat by LAU are low (generally less than 1 mile per square miles). No LAU exceeds 2 miles per square mile. Open road densities slightly higher than in alternatives B, D, and E.

Refugia and Connectivity:

- Cross-country motor vehicle use would be prohibited. This would improve security and reduce the potential for disturbance within lynx habitat and travel corridors during the summer.
- Refugia would continue to be provided within the IRAs on the Forest. Greatest amount of motorized routes within IRAs compared to alternatives B, D, or E.
- Lynx habitat and habitat corridors in winter would be more fragmented relative to Alternative A due to an additional 58,900 acres in lynx habitat open to over-snow motorized use. Alternative C would not adequately ensure protection of the five main habitat corridors on the Forest.
- Riparian area travel corridors would be slightly improved because of limits on motorized cross-country travel.

Snow Compaction:

- No change in the total (137) miles of groomed snowmobile trails in lynx habitat in LAUs resulting in no change in potential effects.
- For some individual LAUs, slight increases in groomed routes in lynx habitat would meet TEST34 when these LAUs are looked at in combination with adjacent LAUs (LAUs 6 + 7 and LAUs 8 + 9) (Tables W-5, W-6) and when existing areas of snow compaction are considered (LAU 22).
- Opens 58,900 additional acres to over-snow vehicle use (and use as play areas) in lynx habitat. These acres occur in five LAUs (Table W-5) and would not meet Forest Plan direction (TEST34) for protection of lynx habitat from increases in snow compaction. This would potentially increase disturbance and interference from other carnivores in lynx habitat.

Alternative D

Roads and Trails:

- Decrease of approximately 100 miles of roads and motorized trails in lynx habitat resulting in a potential decrease in human disturbance in lynx habitat.
- Road densities in lynx habitat by LAU are low (generally less than 1 mile per square miles). No LAU exceeds 2 miles per square mile. Open road densities slightly lower than other alternatives.

Refugia and Connectivity:

- Cross-country motor vehicle use would be prohibited. This would improve security and reduce the potential for disturbance within lynx habitat for lynx and lynx prey.
- Refugia would continue to be provided within the IRAs on the Forest. Fewest new motorized routes within IRAs compared to alternatives A, B, C, or E.
- Summer habitat corridors would be improved relative to Alternative A due to proposed closure of areas to off-road or trail use.
- Lynx habitat and habitat corridors in winter would benefit due to closure of an additional 154,500 acres in lynx habitat to over-snow motorized use. Alternative D provides the most protection of the five main habitat corridors on the Forest.
- Riparian area travel corridors would be slightly improved because of the limits on motorized cross-country travel.

Snow Compaction:

- A slight reduction in groomed snowmobile routes in lynx habitat from 137 miles to 129 miles resulting in slight benefits.
- Close an additional 149,900 acres to over-snow motorized use in lynx habitat. This would reduce over-the-snow compaction and any subsequent potential competition from other forest carnivores. Compared with the other alternatives, Alternative D would have the most beneficial effects on lynx habitat.

Alternative E

Roads and Trails:

- Slight decrease in roads and motorized trails in lynx habitat resulting in a potential slight decrease in human disturbance in lynx habitat.
- About six new miles of motorized trail designation is proposed along a ridge between Tamarack Resort and Council. The LCAS discourages the building of new roads on ridge tops as this might interfere with lynx habitat connectivity although there is no specific standard.

Ridgelines and riparian areas are used extensively as travel corridors not only for lynx but many other species of wildlife such as wolverine.

- Road densities in lynx habitat by LAU are low (generally less than 1 mile per square mile). No LAU exceeds 2 miles per square mile. Open road densities slightly lower than in Alternative A, but slightly higher than Alternative D.

Refugia and Connectivity:

- Cross-country motor vehicle use would be prohibited. This would improve security and reduce the potential for disturbance within lynx habitat.
- Refugia would continue to be provided within the IRAs on the Forest. Slightly more motorized routes within IRAs compared to Alternative D.
- In summer, projected corridors for habitat connectivity would benefit due to proposed closure of areas to off-road or trail use.
- Lynx habitat and habitat corridors in winter would be less fragmented relative to Alternative A due to overall decrease in acres in lynx habitat open to over-snow motorized use. Alternative E would largely protect the five main habitat corridors on the Forest, with the possible exception of the southernmost portion of the Patrick Butte to Slab Butte corridor (see discussion under wolverine).
- Riparian area travel corridors would be slightly improved because of limits on motorized cross-country travel.

Snow Compaction:

- No change in the total (137) miles of groomed snowmobile trails in lynx habitat in LAUs resulting in no change in potential effects. For some individual LAUs, slight increases in groomed routes in lynx habitat would meet TEST34 when these LAUs are looked at in combination with adjacent LAUs (LAUs 6 + 7 and LAUs 8 + 9) (Table W-5, W-6) and when existing areas of snow compaction are considered (LAU 22).
- Close 79,900 acres open to over-snow vehicle use (and use as play areas) in lynx habitat. Although one LAU would open 16,000 acres to over-snow motorized use, this is offset by 33,000 acres of closures in adjacent LAUs.

Cumulative Effects – All Alternatives

Several past and ongoing activities have resulted in positive effects on lynx habitat. Decisions closing areas of the Forest to off-road travel or snowmobile use have positive effects for lynx and lynx habitat. The presence of roadless areas contributes to lynx refugia.

Past vegetation management projects and natural wildfires may have benefited lynx through creation of early seral habitat for snowshoe hares. Projects that promote mature forests contribute towards denning habitat. The past development of Brundage Mountain Resort has reduced the habitat suitability of the area for lynx and their prey.

The Forest Service ongoing and reasonably foreseeable actions (Appendix D) that may cumulatively affect lynx include this Travel Plan, recreation management, and proposed vegetation management projects (such as the Upper Elevation Groomed Route Improvement project). In general, these actions would cumulatively benefit lynx and lynx habitat because they include requirements to protect lynx and conserve their habitat as required by Endangered Species Act (ESA) and the Forest Plan.

Activities on adjacent private and other lands are unlikely to contribute to cumulative effects on lynx habitat, since most private land occurs at low elevations that currently are not considered habitat for lynx. The exception is the continued expansion of Tamarack Resort, portions of which are likely to occur in lynx habitat. Expansion efforts involving NFS lands are likely to result in

continued protective measures for lynx habitat, but expansion on state or private lands are expected to contribute to negative cumulative effects to lynx habitat.

In general, Alternative A neither contributes nor removes cumulative effects to lynx and lynx habitat when considered with the other past, present, and future activities that may affect lynx and lynx habitat in and around the PNF.

In winter, Alternative B is likely to contribute to slight cumulative improvements to lynx habitat. Alternative D contributes to greater cumulative improvements. In winter, the potential loss of habitat due to Tamarack Resort's potential ski area expansion might be somewhat offset by the additional protection of areas to motorized over-snow travel in alternatives B, D, and E. Winter is an important time for lynx since over-winter starvation can be a limiting factor for lynx populations. Activities limiting disturbance and snow compaction such as the snowmobile closure areas have positive effects for lynx. Alternative C, when considered with other actions, is likely to contribute to slight negative cumulative effects in winter.

All action alternatives reduce off-road vehicle travel in summer with potential benefits to lynx habitats. While Alternative D proposes the greatest reduction in motorized routes, Alternative B and E also reduce the miles of motorized trails and roads compared with Alternative A resulting in slight cumulative benefits. Alternative C proposes increases in motorized routes leading to slight negative cumulative effects on lynx. In summary, while some proposed activities might have negative effects on lynx or its habitat these effects are expected to be offset by the overall improved quality of lynx habitat provided by the reductions in cross-country and over snow travel in Alternatives B, D, and E.

Effects Determination

Canada lynx are not known to be present on the PNF, however there is potential for lynx to occur on the Forest since they occur on adjacent Forests and could potentially disperse to the PNF. Hence, maintenance and protection of habitat connectivity within and between the PNF's five main corridors was identified as the most important aspect of lynx habitat on the PNF. Both Alternative D (see Figure W-1) and Alternative E (see Figure W-2) address this concern as well as Forest Plan direction (TEOB12 and TEOB14) for lynx, to maintain habitat connectivity and linkages (see Forest Plan Consistency discussion below).

Alternative C expands the acres available to over-snow vehicle use in lynx habitat from about 74 percent to 81 percent of the Forest, outside of Wilderness. These additional acres open to motorized over-snow use do not meet Forest Plan direction (TEST34) and specifically impacts five LAUs. This direction is directly tied to effective conservation of lynx as outlined in the LCAS. Although no verified sightings of lynx have occurred on the PNF in more than 30 years, the Forest has not conducted surveys in all likely areas. Lacking more definitive studies on lynx occurrence on the PNF and more research on the influence of over-snow motorized use on competition by other predators with lynx, the Forest has no rationale for modifications of Forest Plan direction. Hence, Alternative C ***may affect and is likely to adversely affect*** Canada lynx.

Alternatives B, D, and E improve conditions for lynx and their prey by closing some roads and trails as well as closing additional acres to motorized over-snow use. Of all the alternatives, Alternative D most effectively protects habitat for Canada lynx particularly corridors for habitat connectivity. Each alternative ***may affect Canada lynx, but is not likely to adversely affect*** Canada lynx or their habitat

Forest Plan Consistency Specific to Lynx

TEOB12 directs that: *during project planning, field review lynx analysis units (LAUs) that overlay project areas to determine the suitability for denning, foraging, security, and connectivity of habitat within the project area*.

Areas and corridors that could provide habitat connectivity for lynx were identified (see Figures W-1, W-2).

TEOB14 states: *During mid or project scale analysis, identify and prioritize opportunities for restoration of habitat linkage zones to promote genetic integrity and species distribution (see Figure E-1 in Appendix E of the Forest Plan*).

Figure E-1 was updated to provide information more pertinent to lynx (see figures W-1, W-2). In the Travel Plan analysis, Alternative D would provide the greatest opportunities for restoration of habitat linkage zones, followed by Alternative E, which provides somewhat more restricted opportunities.

TEOB28 states that *during travel planning, areas of concentrated snow compaction activities in lynx habitat within LAUs should be identified and snow compaction in those areas should be minimized to reduce potential conflicts*.

Although a detailed map was not developed for this planning process, areas of concentrated use were identified. So much of the Forest contains lynx habitat that in order to provide reasonable access for recreationists, not all lynx habitat can be protected from disturbance. Most of the currently suitable lynx habitat is protected against snow compaction because it is heavily treed and therefore not accessible to snow machines. Snowmobiles tend to 'play' in open areas and trails tend to be on existing roads and trails. Although lynx (and other predators) may utilize these compacted trails, the main prey for lynx, snowshoe hare avoid these open areas.

TEOB30 direction is *to manage recreational activities to maintain lynx habitat and connectivity.* Lynx habitat is maintained to different degrees with all the alternatives considered for the PNF Travel Plan. Alternative D would manage recreational activities to maintain lynx habitat and wildlife habitat connectivity by closing large areas to over-snow vehicle use. Alterative E would also maintain lynx habitat and connectivity. Forest Plan direction that recreational activities should be managed to maintain lynx habitat and connectivity appears to be met for non-snow months by all alternatives. Under all alternatives, the motorized roads and trail density in lynx habitat is low (Wildlife Specialist Report). In addition, cross-country motor vehicle use is prohibited in all action alternatives.

TEST34 direction allows *no net increase in groomed or designated over-the-snow routes or play areas, outside of baseline areas of consistent snow compaction, by LAU or in combination with immediately adjacent LAUs unless the Biological Assessment demonstrates the grooming or designation serves to consolidate use and improve lynx habitat*.

Compliance with this standard is described above. The total miles of groomed snowmobile routes would not increase above the existing condition in any of the action alternatives, although the locations vary slightly. Snowmobile use into new areas on the Forest is expected to expand from the current situation in areas open to motorized over-snow use. The number of snowmobile users is also expected to increase.

Compared with the No Action Alternative, alternatives B, D, and E would reduce the acres open and subject to snow compaction, which is consistent with Forest Plan direction.

Alternative C would increase the number of acres open to motorized over-snow travel, and hence increase the areas designated open that could be used as snow play areas without accompanying

reductions elsewhere. Therefore, Alternative C would not be consistent with the Forest Plan, and would require a project-specific amendment for Forest Plan standard and guideline TEST34:

> *Allow no net increase in groomed or designated over-the-snow routes or play areas, outside of baseline areas of consistent snow compaction, by LAU or in combination with immediately adjacent LAUs unless the Biological Assessment demonstrates the grooming or designation serves to consolidate use and improve lynx habitat… (USDA Forest Service 2003a)*

The amendment would be limited to this one project and to several Management Areas. It would encompass five LAUs and increase the amount of lynx habitat open to over-snow motor vehicle use on the Forest (outside of Wilderness) from 74 to 81 percent. It would not likely affect outputs of Forest Plan goods and services and would not change Forest management prescriptions (FSH 1909.12 section 5.32).

TEST12 direction is to *minimize or avoid management actions within known nest or denning sites of TEPC species if those actions would disrupt reproductive success during the nesting or denning period. During project planning, determine sites, periods, and appropriate mitigation measures to avoid or minimize effects*.

Although lynx denning habitat exists throughout the Forest, no actual lynx dens are known to be present on the Forest. Denning habitat occurs in dense timber stands with an abundance of fallen logs. All action alternatives for the Travel Plan would minimize or avoid management actions in lynx denning habitat.

Direct and Indirect Effects - Sensitive Species

Columbia Spotted Frog – Northern Population

Wildlife Issue 5: Travel management may affect habitat and/or populations of threatened, endangered, and Forest Service Sensitive Species.

Indicators:

- Changes in habitat and potential effects on individuals and populations.

Alternative A – No Action

The No Action Alternative continues to allow cross-country motor vehicle use on approximately 511,000 acres. Many of those acres occur in areas adjacent to RCAs. OHV play in wetlands, ponds, permanent standing water, and RCAs may impact spotted frogs and their habitat by crushing individuals, removing vegetation, destroying egg masses and reducing site suitability for frogs. Established and/or proposed roads and trails generally do not impact spotted frogs or their habitat due to standards for road and trail development. Indirectly however, a trail that goes by a pond used by spotted frogs could possibly attract recreationists who could disturb the frogs. Other than OHV use and curious recreationists this alternative would not impact spotted frogs or their habitat.

Action Alternatives B, C, D, and E

All the action alternatives restrict OHV use to designated roads or trails and their buffers so OHV use should not impact spotted frog habitat. Roads or trails in RCAs should not affect existing spotted frog habitat. Over-snow motorized use should not impact spotted frogs or their habitat (unless gas/oil leaks from the machines) as they would be beneath the water surface during the winter.

Cumulative Effects

None of the action alternatives are expected to result in cumulative impacts spotted frogs or their habitat when added to ongoing or reasonably foreseeable actions (Appendix D) on the Forest and adjacent lands.

Effects Determination

For the reasons stated above, the action alternatives in the PNF Travel Plan ***may impact individual spotted frogs, but would not likely contribute to a trend toward Federal listing, or cause a loss of viability*** to the population or species.

Boreal Owl

Wildlife Issue 5: Travel management may affect habitat and/or populations of threatened, endangered, and Forest Service Sensitive Species.

Indicators:

- Changes in habitat and potential effects on individuals and populations.

All Alternatives

The proposed alternatives for the PNF Travel Plan would not have measurable impacts on boreal owl individuals or their habitat as these owls typically roost and nest in areas away from human disturbance in higher elevations. In addition, the species of trees they use for nesting, although occasionally taken, are not sought after by firewood cutters. Alternative A allows motorized cross-country use (summer) on approximately 511,000 acres mainly on the western portion of the Forest. The areas open to motorized cross-country use are not in boreal owl habitat. The action alternatives restrict OHV use to designated roads and trails. The only habitat modification that could occur with any of the alternatives considered would be trees/snags removed for road/trail maintenance and safety, and the occasional snag removed for firewood. Firewood removal could decrease the amount of spruce and subalpine fir trees and decrease the number of large snags available. However, only a small percent of the subalpine fir would be harvested, and most of the potential habitat is away from open roads.

Cumulative Effects

None of the action alternatives are expected to result in cumulative impacts to this species when added to past, ongoing, or reasonably foreseeable actions (Appendix D) on the Forest or adjacent lands.

Effects Determination

All action alternatives ***may impact individual boreal owls but would not likely contribute to a trend toward Federal listing or cause a loss of viability*** to the population or species.

Flammulated Owl

Wildlife Issue 5: Travel management may affect habitat and/or populations of threatened, endangered, and Forest Service Sensitive Species.

Indicators:

- Changes in habitat and potential effects on individuals and populations.

Alternative A – No Action

The No Action alternative likely does not have any measurable direct impacts on flammulated owl individuals or their habitat. However, Alternative A allows motorized cross-country use in summer on approximately 511,000 acres, mainly on the western portion of the Forest. The motorized cross-country use could disturb and possibly disrupt flammulated owl nesting. Also, species of snags preferred by flammulated owls for nesting are sought after by firewood cutters. The more acres accessible to off-road use, the higher the potential important snag habitat for the owls would be removed. Flammulated owl habitat is already limited on the Forest. Noise and disturbance from recreationists could temporarily alter flammulated owl behavior.

Action Alternatives B, C, D, and E

The action alternatives restrict OHV use to designated roads and trails, so any habitat modification would likely be confined to removal of trees and snags for safety, and firewood needs in an area within 300 feet of open roads. In general, restricting these impacts to a smaller area would benefit the flammulated owl. The PNF Travel Plan action alternatives would have limited effects on flammulated owls and/or their habitat. Human activity in areas of flammulated owl use can also cause temporary disruption or disturbance but generally would not cause the birds to leave an area permanently.

Cumulative Effects

As discussed earlier, each of the Travel Plan alternatives allow varying amounts of access for activities that may impacts wildlife species. Of these activities, firewood gathering has the potential to negatively impact flammulated owl habitat, in particular potential nest trees. Conversely, several ongoing and future vegetation management projects (Appendix D) have the potential to improve habitat for flammulated owl through promoting growth of large diameter seral trees. Projects such as the Meadows Slope Wildland Fire Protection Project would help to enhance and restore flammulated owl habitat. The additional reasonable foreseeable actions are not expected to cumulatively impact the flammulated owl or its habitat.

Fuel reduction projects on private land have the potential to improve habitat for flammulated owl in lower-elevation forests dominated by ponderosa pine and Douglas fir. However, residential development in this type of forest would remove potential habitat for flammulated owls.

In summary, most of the past, ongoing and reasonably foreseeable actions both on and off Forest would not have cumulative effects on flammulated owls and its habitat, except for the projects and activities discussed above. Action alternatives are expected to have an incremental positive effect on flammulated owls through restricting cross-country travel and associated probability of increased disturbance and loss of large snag habitat by firewood gathering.

Effects Determination

All PNF Travel Plan action alternatives ***may impact individual flammulated owls but would not likely contribute to a trend toward Federal listing or cause a loss of viability*** to the population or species.

Great Gray Owl

Wildlife Issue 5: Travel management may affect habitat and/or populations of threatened, endangered, and Forest Service Sensitive Species.

Indicators:

- Changes in habitat and potential effects on individuals and populations.

Alternative A – No Action

The No Action alternative may be causing localized impacts to great gray owl individuals or their habitat because it allows motorized cross-country use in summer on approximately 511,000 acres. The motorized cross-country use could directly disrupt owl nesting and allow for firewood cutting that may remove potential nest sites. OHV use in open meadows has the potential to degrade habitat conditions for great gray owl prey.

Action Alternatives B, C, D, and E

The action alternatives restrict travel to designated roads and trails, so any habitat modification would likely be confined to removal of trees and snags for safety and firewood needs in an area within 300 feet of open roads. In general, restricting these impacts to a smaller area would benefit great gray owls. Prohibiting off-road travel would protect open meadow habitats, thereby benefiting great gray owls and their prey. Travel off-road for 300 feet for the purpose of dispersed camping could still cause minor localized impacts on great gray owl habitat.

Cumulative Effects

As discussed earlier, an indirect effect of the Travel Plan alternatives is the reduced access allowed for firewood gathering by limiting off road travel and the amount of designated open roads. Firewood gathering has the potential to remove structure in great gray owl habitat, in particular potential nest trees. Past vegetation management projects have affected great gray owl habitat but current ongoing vegetation management projects (Appendix D) are not expected to affect great gray owl habitat.

The Forest Service reasonable foreseeable actions (Appendix D) are not expected to impact great gray owls or its habitat. There are several developments and activities occurring in the foreseeable future adjacent to the Forest. Residential development would remove potential habitat for great gray owls. This would not be cumulatively negative, because action alternatives are expected to have an incremental positive effect on great gray owls through restricting cross-country travel and reducing associate the loss of large snag habitat by firewood gathering.

Effects Determination

All PNF Travel Plan action alternatives ***may impact individual great gray owls but would not likely contribute to a trend toward Federal listing or cause a loss of viability*** to the population or species.

Northern Goshawk

Wildlife Issue 5: Travel management may affect habitat and/or populations of threatened, endangered, and Forest Service Sensitive Species.

Indicators:

- Changes in habitat and potential effects on individuals and populations.

Alternative A

The existing Travel Management Plan has limited potential to impact goshawk individuals or their habitat. No known nest sites are currently impacted by the plan; although there is a slight possibility that potential habitat near open roads could be altered by firewood gathering. Off-road travel would not be expected to influence goshawk prey availability; however, human activity especially in close proximity to a nest site could temporarily disturb individuals.

Action Alternatives B, C, D, and E

The action alternatives restrict travel to designated roads and trails. This would benefit goshawks, compared to the No Action alternative, because there would be less opportunity to disturb nesting birds. Travel off-road for 300 feet for the purpose of dispersed camping would still be allowed and could cause minor localized impacts on habitat. Human activity in close proximity to birds or their nest could temporarily disturb individuals.

Cumulative Effects

In general, all action alternatives would slightly reduce potential effects to goshawks and goshawk habitat by limiting off road travel and the amount of designated open roads. With these limits, the potential for disturbing goshawks, their habitat and prey would be incrementally reduced from the current condition. Past vegetation management projects have affected goshawk habitat, but current and future vegetation management projects (Appendix D) are not expected to detrimentally affect goshawk habitat per direction of the Forest Plan, hence there would be no negative cumulative effects on NFS lands.

Ongoing and proposed housing and ski area development on adjacent private and state lands would likely occur in goshawk habitat resulting in potential negative effects on goshawks and goshawk habitat. The effects of any of the Travel Plan alternatives are not expected to cumulatively contribute to these other activities.

Effects Determination

All PNF Travel Plan alternatives ***may impact individual goshawks but would not likely contribute to a trend toward Federal listing or cause a loss of viability*** to the population or species.

Fisher

Wildlife Issue 5: Travel management may affect habitat and/or populations of threatened, endangered, and Forest Service Sensitive Species.

Indicators:

- Changes in habitat and potential effects on individuals and populations.

All Alternatives

Fishers are not known to exist on the Forest and they are rare. The PNF Travel Management Plan is not expected to directly impact fisher. The Travel Plan itself would not impact vegetation to any measurable extent. Under the action alternatives woodcutters would be allowed to remove snags and down logs within 300 feet on open roads unless designated otherwise. However, woodcutters are not permitted to cut trees in riparian zones, which would limit potential impacts to primary fisher habitat. Fisher prefer old to mature forest habitat and areas in close proximity to riparian areas with large trees and down logs so snowmobiles would not impact their habitat to any large extent. Cross-country travel permitted in Alternative A is not expected to impact fisher or their habitat since they prefer more densely forested habitat, which is mostly inaccessible to OHV travel.

Cumulative Effects

As discussed earlier, an indirect effect of the Travel Plan alternatives is the access allowed for firewood gathering. Firewood gathering has the potential to remove structure in fisher habitat, in particular habitat for fisher prey species. Past vegetation management projects have affected fisher habitat but the current ongoing vegetation management projects (Appendix D) are not expected to detrimentally affect potential fisher habitat.

The FS reasonable foreseeable actions (Appendix D) are not expected to detrimentally impact fisher or its habitat. There are several developments and activities occurring in the foreseeable future adjacent to the Forest. At this time it is not known whether these developments and activities would impact potential fisher habitat. In summary, the past, ongoing and reasonably foreseeable actions both on and off Forest in combination with travel planning actions would likely have inconsequential cumulative effects on fisher or its habitat.

Effects Determination

All PNF Travel Plan alternatives may ***impact individual fishers but would not likely contribute to a trend toward Federal listing or cause a loss of viability*** to the population or species.

Wolverine

Wildlife Issue 3: Over-snow vehicle use may affect wolverine denning habitat.

Indicators:

- Percent of wolverine denning habitat closed to over-snow vehicle use.
- Effects of over-snow vehicle use on habitat connectivity.

Common Effects of Travel Management

Travel management may slightly affect wolverines on the PNF through habitat modification, exploitation, or pollution. Disturbance, particularly in winter months is the primary travel management impact on wolverines.

Exploitation is an indirect effect of travel management in that roads and trails are used to access the National Forest for harvesting animals. While wolverine harvest is not legal in Idaho, wolverines are vulnerable to incidental trapping with baits, due to their behavior as scavengers. Incidental harvest coupled with illegal harvest could impact populations. Over most of its distribution worldwide, trapping and hunting account for the largest proportion of known wolverine mortalities (Banci 1994:108). The IDFG had no reports of any wolverine being trapped and recorded during the period of 1990 through September 2005 (G. Patton pers. comm. with A.

Kuehl 2005), but a wolverine was trapped incidentally in December 2006 on the Boise National Forest about 6 miles from the boundary with the Payette National Forest (D. Evans Mack pers. comm. 2006). Potential effects of habitat modification or pollution are likely negligible. More information is provided in the Wildlife Specialist Report (Project Record). The effects of disturbance are discussed in greater depth below.

Disturbance

Wolverines are habitat generalists in remote areas away from human development (Banci 1994:100). This implies wolverines are sensitive to human disturbance. Disturbance may cause reactions that pose an energetic cost to animals at times of critical energy deficiencies, such as during winter or food shortages, and could have serious health consequences for individual wolverines. Behavioral reactions to disturbance from humans could result in displacement from familiar territories, security cover, and foraging opportunities. Displacement effects due to human disturbance would likely have the greatest impacts on juvenile and sub-adult animals without established secure home range territories and on mothers with young. Separation of young from their mothers could influence wolverine survival rates. Human winter intrusion (i.e. noise, disturbance) into high elevation terrain also poses a concern about effects on dispersal corridors. High elevation ridgelines on the PNF likely provide a corridor for wolverine dispersing between northern and southern Idaho and northeastern Oregon.

Human intrusion within denning habitat during the winter is probably the primary threat to this species (Wisdom et al. 2000). Disturbance effects are most likely to have adverse impacts on wolverines during winter; a critical time period since weather conditions are more extreme, food sources may be limited, thermoregulatory demands are high and reproductive females have the added energetic demands of developing fetuses, giving birth and nursing kits (Inman et al. 2003:1). Human disturbance during this challenging time could result in increased energy expenditures and negative impacts on wolverine survival and reproductive rates.

Although healthy adult female wolverines are capable of annual reproduction, most studies report that not all reproductive age females produce young each year (Hornocker and Hash 1981, Magoun 1985, Banci and Harestad 1988, Persson 2003, Inman et al. 2003). This may be due to high energetic demands of reproduction that limits the ability of females to give birth every year (Banci 1994:105, Inman et al. 2003:1). Maternal den abandonment could result in relocation of kits to less suitable sites, where they may be more vulnerable to exposure, predation or other threats (Pulliainen 1968), and could therefore influence survival rates.

Wilderness or remote country appears essential to wolverine viability (Hornocker and Hash 1981). Human encroachment into existing refugia may threaten the wolverine's ability to maintain basic life history requirements (Copeland and Hudak 1995) and may cause habitat fragmentation that could preclude subpopulation interspersion and lead to population isolation (Copeland 1996). Rowland et al. (2003) found that wolverine were more prevalent in areas with greater amounts of habitat, lower road densities, and low human population densities. The persistence of wolverines in Montana, despite unlimited historic trapping and hunting, may be attributed to the presence of designated wilderness and remote, inaccessible habitat (Hornocker and Hash, 1981, Ruggerio et al. 1994).

Recent technological advances in snowmobile capabilities have raised concerns about intrusion in previously isolated areas (Wisdom et al. 2000) where natal dens may occur. Increases in motorized over-snow recreation have likely displaced wolverines from potential denning habitat (Copeland 1996) or caused females to abandoned occupied dens or attempt to move young (Copeland and Hudak 1995). Females with young tend to be very sensitive to disturbance especially before the kits are weaned. Magoun and Copeland (1998) found that females studied in

Idaho moved their young to new maternal den sites following disturbance by researchers. Risk of litter loss is potentially high if den relocation occurs. Because wolverines have low reproductive rates, any losses could be substantial. However, wolverine's sensitivity to human disturbance may be variable. For example Squires et al. (2002) trapped wolverines in areas of high snowmobile activity indicating that wolverine may not necessarily avoid these areas, but reproductive success was not determined. In general, refugia may be the most important habitat component for availability and protection of natal denning habitat (Copeland 1996).

Non-motorized human access can also disturb wolverines at den sites (Magoun and Copeland 1998:1316). Since wolverine den sites are generally in remote, high elevation areas on the PNF, non-motorized dispersed winter use such as backcountry skiing and snowboarding would likely only reach these habitats if facilitated by motorized access. Although cross-country and alpine skiing is popular on the Forest, the PNF has no designated cross-country ski trails on the Forest in wolverine denning habitat. Backcountry skiers may occasionally enter potential wolverine denning habitat but since these areas tend to be remote, use would likely be minimal and negligible when compared to use associated with motorized over-snow travel.

Non-Denning Refugia

Non-denning refugia are best described in terms of availability of secure, undisturbed blocks of habitat. The Frank Church River of No Return (FC-RONR) Wilderness provides approximately 2.4 million acres of habitat relatively undisturbed by human activity. The PNF portion of the Wilderness is addressed in this analysis because the habitat within the wilderness is a significant component for wolverine viability on the Forest. Outside of the Wilderness, the PNF contains Inventoried Roadless Areas (IRAs) that provide approximately 926,600 acres of largely remote areas during non-snow months (see also discussion on refugia in the lynx analysis section.)

Each of the action alternatives would close the Forest to cross-country motorized travel during non-snow months. This decision would enhance protection from most disturbances during the snow-free months not only for wolverine but also their prey.

Connectivity can also be used as a measure of refugia as well as an indicator of how well wolverine might move across the landscape. A summary of the effects of travel management on habitat connectivity is provided at the beginning of the Environmental Consequences section. The effects on habitat connectivity in relation to wolverine are discussed below for each alternative.

Comparison of Impacts by Alternative

Effects to wolverines caused by human travel on National Forest lands differ among the alternatives proposed in the Travel Plan. The primary mechanism for travel management to affect wolverines was determined to be through the disturbance caused by over-snow motorized access into wolverine habitat, particularly denning areas. Effects of this access on habitat connectivity are also discussed.

Denning Habitat

Wolverine natal denning habitat appears to be tied to high elevation and glaciated landscapes. Potential denning habitat on the Payette National Forest was determined based on landtype (primarily cirque basins). For more information on identification of denning habitat, refer to the Wildlife Specialist Report (Project Record).

Maps of potential denning habitat were overlain with maps of areas closed to over-snow motorized use to determine the number of acres protected from disturbance. The analysis area for direct and indirect effects to denning habitat was the PNF outside of the FC-RONR Wilderness

(Table W-8). The analysis area for cumulative effects to wolverine denning habitat was the entire PNF including the FC-RONR Wilderness (Table W-9). Table W-11 provides a summary of acres open and closed within potential wolverine denning habitat with the project area and for the entire Forest.

Table W-8. Acres of Wolverine Denning Habitat Open and Closed to Over-snow Vehicle Use in the Project Area (Wilderness not included) by Alternative.

Alternative	Potential Denning Habitat	Total Closed		Total Open	
		Acres	%	Acres	%
A	83,240	25,765	31%	57,475	69%
B	83,240	27,470	33%	55,770	67%
C	83,240	22,960	28%	60,280	72%
D	83,240	54,450	65%	28,790	35%
E	83,240	46,290	56%	36,950	44%

Table W-9. Acres of Wolverine Denning Habitat Open and Closed to Over-snow Vehicle Use on the entire Payette National Forest (FC-RONR Wilderness included) by Alternative.

Alternative	Potential Denning Habitat	Total Closed		Total Open	
		Acres	%	Acres	%
A	125,050	67,570	54%	57,480	46%
B	125,050	69,280	55%	55,770	45%
C	125,050	64,765	52%	60,285	48%
D	125,050	96,260	77%	28,790	23%
E	125,050	88,096	70%	36,954	30%

Table W-10. Acres of Wolverine Denning Habitat Closed to Motorized Over-snow Use by Management Area.

Management Area (Total Acres Potential Denning Habitat)	Alt. A Acres (%)	Alt.B Acres (%)	Alt. C Acres (%)	Alt.D Acres (%)	Alt. E Acres (%)
MA 1 - Hells Canyon (305)	84 (28)	84 (28)	84 (28)	84 (28)	84 (28)
MA2 - Snake River (834)	258 (31)	258 (31)	258 (31)	2589 (31)	258 (31)
MA 3 – Weiser River (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
MA 4 - Rapid River (2,686)	495 (18)	495 (18)	495 (18)	736 (27)	741 (28)
MA 5 – Middle Little Salmon River (145)	0 (0)	145 (100)	145 (100)	145 (100)	145 (100)
MA 6 – Goose Creek/Hazard Creek (6,456)	0 (0)	151 (2)	105 (2)	3,122 (48)	1025 (16)
MA 7 – Payette Lakes (14,224)	4,455 (31)	5,591 (39)	4,125 (29)	9,089 (64)	5591 (39)

Table W-10. Acres of Wolverine Denning Habitat Closed to Motorized Over-snow Use by Management Area.

Management Area (Total Acres Potential Denning Habitat)	Alt. A Acres (%)	Alt.B Acres (%)	Alt. C Acres (%)	Alt.D Acres (%)	Alt. E Acres (%)
MA8 – Kennally Creek (3,601)	54 (1)	54 (1)	54 (1)	6,30 (18)	54 (2)
MA 9 – Lake Creek/French Creek (5,390)	0 (0)	0 (0)	0 (0)	4,586 (85)	2,966 (55)
MA 10 – Fall Creek/Warren Creek (3,371)	87 (2)	87 (2)	0 (0)	1,602 (48)	1,515 (45)
MA 11 – Upper Secesh River (5,768)	737 (13)	737 (13))	543 (9)	3,655 (63)	3,655 (63)
MA12 – South Fork Salmon River (28,223)	17,444 (62)	17,716 (63)	14,996 (53)	23,742 (84)	23,512 (83)
MA 13 – Big Creek/Stibnite (11,889)	2,150 (18)	2,150 (18)	2,150 (18)	6,799 (57)	6,741 (57)
MA 14 - Wilderness (41,808)	41,808 (100)	41,808 (100)	41,808 (100)	41,808 (100))	41,808 (100)

Table W-11. Summary by Alternative of the Amount of Potential Denning Habitat Closed to Over-snow Motorized Use in the Project Area (Wilderness not included) and in the Cumulative Effects Area (Wilderness included).

Potential Denning Habitat Closed to Over-snow Motorized Use – Wilderness Not Included					
	Alt. A	**Alt. B**	**Alt. C**	**Alt. D**	**Alt. E**
Acres in Closure	25,765	27,470	22,960	54,450	28,790
Percent Total Denning Habitat	31%	33%	28%	62%	35%
Potential Denning Habitat Closed to Over-snow Motorized Use – Wilderness Included					
	Alt. A	**Alt. B**	**Alt. C**	**Alt. D**	**Alt. E**
Acres in Closure	67,570	69,280	64,765	96,260	88,096
Percent Total Denning Habitat	54%	55%	52%	77%	70%
Percent in Wilderness	62%	60%	64%	44%	67%

*total acres of denning habitat not including wilderness = 83,240
**total acres of denning habitat including wilderness = 125,050

For each management area, maps of potential denning habitat were also overlain with maps of areas closed to over-snow motorized use to determine the number of acres protected from disturbance by management area. Changes by management area are shown in Table W-10. Maps are available in the Wildlife Specialist Report (Project Record).

In the Wilderness MA (MA 14), the entire potential wolverine denning habitat is protected from motorized over-snow disturbance. Cumulatively, this MA provides an estimated y 33 percent of the denning habitat available on the Forest.

Slightly less than 44 percent of the denning habitat outside of Wilderness is located in three of the thirteen non-Wilderness MAs. The Payette Lakes MA contains 11 percent, the South Fork Salmon River (SFSR) MA contains 22 percent, and Big Creek/Stibnite MA has about 10 percent of the wolverine denning habitat on the PNF. Currently, Payette Lakes has 31 percent of the wolverine denning habitat closed to over-snow motorized use, South Fork Salmon River has 62 percent, and

Big Creek/Stibnite has 18 percent closed to over-snow motorized use. The remaining ten MAs provide 23 percent of the total wolverine denning habitat on the Forest, but the location of this habitat may be very important to maintain denning habitat across the Forest.

Locations of wolverine on the Forest in the past 3 years and during a research study 12 years ago, were concentrated in the Goose Creek/Hazard Creek MA (#6), the Payette Lakes MA (#7), and the SFSR MA (#11). While recent locations are partly a result of track survey efforts in MAs 6 and 7 by IDF&G, locations in the mid-1990s were via radio telemetry.

Although the FC-RONR Wilderness protects a large area of potential wolverine denning habitat, the direct effects to wolverine denning habitat must be considered for the project area (the thirteen MAs outside of Wilderness). Outside Wilderness, the amount of potential wolverine denning habitat protected in the Payette Lakes MA would be 31 percent (4,455 acres) in Alternative A, 39 percent (5,591 acres) in Alternative B, 29 percent (4,125 acres) in Alternative C, 64 percent (9,098 acres) in Alternative D, and 39 percent (5,591 acres) in Alternative E. The amount of potential wolverine denning habitat protected in the Goose Creek/Hazard Creek MA would be zero in Alternative A, 2 percent (151 acres) in Alternative B, 2 percent (105 acres) in Alternative C, 48 percent (3,122 acres) in Alternative D, and 16 percent (1,025 acres) in Alternative E. Alternative D takes the most conservative approach to the protection of wolverine denning habitat. The actual percent of potential denning habitat protected from winter disturbance is unknown since the number of acres of denning habitat inaccessible to over-snow motorized vehicles due to dense forest, steep rocky cliffs, or remoteness of the area is unknown. In addition, the amount of denning habitat needed in an area for successful reproduction is also unknown.

The total miles amount of groomed snowmobile routes does not increase above the baseline of 144 miles for any of the action alternatives. A small amount of groomed snowmobile routes occur on the edge of wolverine denning habitat in MAs 6 and MA 7. These small amounts of designated routes are not likely to add measurable effects to wolverine denning habitat in areas already impacted by dispersed snowmobile use. These effects are the same for all alternatives.

Alternative B would close approximately 468,600 acres of which 27,470 acres are in potential wolverine denning habitat. Alternative D would close about 656,000 acres of which 54,450 acres occur in denning habitat. Alternative E would close about 565,200 acres of which about 46,290 occur in potential wolverine denning habitat. Alternative D would close the largest amount of area and reduces the potential for human disturbance of wintering wolverines more than any other alternative. Outside of the FC-RONR Wilderness, Alternative D increases the amount of protected wolverine denning habitat from 31 percent in Alternative A to 62 percent. Alternative E increases the amount nearly as much to 56 percent Alternative B increases the amount to 33 percent. Alternative C decreases the amount of protected denning habitat to 28 percent.

Alternative B would increase protection in the Middle Fork Salmon River, Goose Creek/Hazard Creek, and Payette Lakes MAs and provide slightly more protection in the South Fork Salmon River MA compared to Alternative A.

Alternative C would eliminate the closure area in Fall Creek/ Warren Creek MA and would decrease the amount of closure in the South Fork of the Salmon River and Upper Secesh MAs relative to Alternative A. However, Alternative C would increase the closed acres in Middle Little Salmon River and Goose Creek/Hazard Creek MAs as compared to Alternative A. Relative to Alternative A (current condition), Alternative C would reduce closures in denning habitat by approximately 2,800 acres.

Alternative D would protect denning habitat in the Payette Lakes, Upper Secesh River, Fall Creek/Warren Creek, Big Creek/Stibnite, Lake Creek/French Creek, and South Fork of the Salmon River MAs. Although some of these closures are near to recent locations of wolverine,

additional closures were provided in a revised Alternative D in the FEIS at the request of Idaho Fish and Game. About 2,220 acres of additional closure were located around Bruin Mountain where a wolverine was radio-located in February of 1995 to better protect denning habitat near to this and other recent wolverine locations.

Alternative E would increase protection in the Payette Lakes MA similar to Alternative B, but the Upper Secesh River MA, Fall Creek/Warren Creek MA, Big Creek/Stibnite MA, and South Fork of the Salmon River MAs would receive substantial protection similar to Alternative D. The Lake Creek/French Creek MA would also have substantially increased protection (2,966 acres), although not as much as in Alternative D (4,586 acres). Most notably, Alternative E does not protect the Bruin Mountain area. Although Alternative E does not provide the same level of protection as Alternative D, it is unknown whether this would result in measurable effects to wolverine on the PNF. This is because wolverine easily travel long distances and have large home ranges. Under Alternative E, potential denning habitat is no more than six miles from every recent known wolverine locations. By including the closure on Bruin Mountain in Alternative D, potential denning habitat is no more than three miles from each of the known locations.

Habitat Connectivity

The wildlife analysis determined that the topography and vegetation of the Payette National Forest likely provides for five distinct habitat connection corridors for wolverine. Three of these corridors extend north and south and two of the corridors run east-west (Figure W-1). A description of the corridors is provided in the Wildlife Specialist Report: Project Record. Each corridor is likely important to dispersal, genetic interaction and species recruitment. High ridgelines west of the South Fork Salmon River (i.e. Needles to Patrick Butte), and mountain ridges to the east of the South Fork likely serve as dispersal routes north to south and east to west. These in turn provide movement routes between isolated denning habitats (cirques). The high mountainous ridgelines west of the South Fork Salmon River provide a dispersal corridor to the Seven Devil Mountains and Wallowa Mountains of northeast Oregon and the Gospel Hump Wilderness north of Salmon River.

This portion of the analysis investigates the effects to habitat connectivity in winter months during the critical wolverine denning period. It is not only important to maintain the potential for wolverine to den, it is also essential to provide secure habitat (i.e., connecting secure ridges and valleys) for dispersing wolverines.

Big Creek Corridor

The major portion of the eastern-most north/south corridor runs along the western edge of the River of No Return Wilderness. Although the denning habitat portion of these MAs and IRAs is not closed to motorized over-snow use, access into this area is restricted by the remoteness and steep terrain. Alternatives D and E ensure maintenance of this area for denning and habitat connectivity by closing a large portion of this area to over-snow vehicle use.

Needles IRA to Marshall Mountain Corridor

This corridor extends the entire north to south length through the middle of the Forest. About 62 percent of the denning habitat within the South Fork Salmon River MA 12 portion of the corridor is currently closed to snowmobiles. However, much of the north-central part of the corridor is open to snowmobiles. Most of the north end of this corridor lies within MA 11. Only about 12 percent of the denning habitat in this portion of the corridor is closed to snowmobiles. Maintenance of connectivity (and denning habitat security) in the north end of this corridor is important because this area provides a link between the PNF and the Gospel Hump Wilderness on

the Nez Perce NF. Alternatives D and E would protect important habitat in the northern portion of the corridor.

Most of the middle and southern portion of this corridor is closed to snowmobile use so it is already protected. The southern portion of this corridor extends into the Boise NF. By protecting the northern portion of the corridor, habitat connectivity would be maintained across the PNF and to neighboring National Forests to the north and south.

Slab Butte to Patrick Butte Corridor

The third corridor that runs north to south is shorter in length than the other two corridors. Brundage Mountain Resort lies near the southern end of this corridor. This corridor receives much more winter recreation use than the two other corridors. MAs 6 and 9 contain the bulk of the denning habitat in this ridgeline passageway, about 6,500 and 5,400 acres respectively. Alternative D provides the greatest protection of potential denning habitat and habitat connectivity corridors in MA 9 (4,586 acres), but Alternative E also protects a substantial amount (2,966 acres). Alternatives B and C would protect minimal amounts of MA 6 (about 2 percent each), while Alternative D would protect about 48 percent (3,122 acres) and Alternative E would protect about 16 percent (1,025 acres) out of 6,500 acres of denning habitat in MA 6 from over-snow vehicle use. This importance of this corridor lies in the linkage it provides to lands to the north of the PNF and to the areas in the FC-RONR Wilderness westward across the PNF to the Hell's Canyon area and mountains of Oregon.

FC-RONR Wilderness to Hell's Canyon Corridor

Although the wildlife analysis identified two potential east to west ridgeline corridors on the PNF, the analysis determined that the northern corridor would be the easiest to protect from over-snow vehicle use since this area was further removed from popular over-snow recreation areas in the central portion (see Figures W-1 and W-2.) This corridor extends from the east in the FC-RONR Wilderness and continues west to the Hells Canyon Wilderness on the Wallowa-Whitman NF. Alternatives D and E would provide important protection to this east to west corridor.

Alternative A – No Action

Human intrusion into wolverine denning habitat during the denning period and travel corridor security are the two factors of greatest concern in relation to wolverine habitat on the PNF based on numerous studies that have identified over-snow motorized access as a primary threat to this species (Wisdom et al. 2000).

Alternative A protects approximately 25,765 acres (31 percent) of the 83,240 acres of potential wolverine denning habitat outside of the FC-RONR Wilderness from over-snow vehicle use. About 69 percent of wolverine denning habitat outside Wilderness could be subject to human disturbance leading to potential for increased energy expenditure by wolverines and/or relocation during denning, which may reduce reproductive success. These negative impacts on wolverine survival and reproductive rates could affect population viability in the long term. It is important to note that not all unprotected denning habitat is accessible or being impacted by human intrusions.

Under the current situation, three out of twelve MAs (outside of Wilderness) have no areas of protected denning habitat and two MAs protect 2 percent or less of the denning habitat from motorized over-snow use. MA 12 protects the largest percentage of habitat – about 62 percent. MA 2 and MA 7 protect 31 percent of the denning habitat in the MAs.

Not all potential wolverine denning habitat needs protection, however a variety of wolverine denning opportunities should be protected across the Forest. The location of the protected

wolverine habitat is important to habitat connectivity to sustain viable populations of wolverine and other wildlife species. The analysis shows that habitat corridors important to landscape connectivity are open to motorized over-snow use and may not provide adequate protection to wolverine from the effects of disturbance. Additional information is needed to assess if corridors are intact and/or where changes need to made to provide secure corridors.

Alternative B

Alternative B provides slightly greater protection to wolverine than Alternative A. About 1,700 additional acres are protected within the main corridors identified as important for habitat connectivity on the Forest. While this provides added protection, the additional acres likely do not protect enough of the corridors from winter human intrusion. Additional information is needed to assess where changes are needed to provide secure corridors for habitat connectivity.

Alternative C

Alternative C reduces the number of acres closed to motorized over-snow travel by approximately 2,800 acres for a total of about 22,960 acres (28 percent) of protected wolverine denning habitat. The areas removed include portions of denning habitat within the five main corridors identified as important for habitat connectivity. Alternative C would negatively impact wolverine denning habitat and corridors more than the other action alternatives.

Alternative D

Alternative D provides the most protection to wolverine denning habitat and habitat connectivity of the alternatives considered. Four of the five potential habitat corridors on the PNF would have greater protection with this alternative. Alternative D would protect approximately 54,540 acres (65 percent) of the wolverine denning habitat on the PNF (outside of Wilderness) or approximately 28,865 acres more than Alternative A.

Alternative E

Alternative E provides greater protection to wolverine denning habitat and habitat connectivity then all alternatives except Alternative D. Four of the five potential habitat corridors on the PNF would have greater protection than under the No Action alternative. Alternative E would protect approximately 46,290 acres (56 percent) of the wolverine denning habitat on the PNF (outside of Wilderness) or approximately 16,525 acres more than Alternative A.

Cumulative Effects

Effects to wolverines on and around the PNF occur primarily in the form of habitat alterations and human disturbance, on both public and private lands. Habitat alterations include timber harvest, fire, insect or disease outbreaks, weed infestations and major developments that alter the wolverine's natural habitat and/or pose barriers to movement. In general, alterations have been limited at higher elevations; i.e. near potential wolverine reproductive denning habitat, due to difficult access and the lack of commercially desirable timber products at higher elevations. Natural processes such as fire, wind throw, and insects and disease can affect forest cover at or near timberline, but these processes leave behind structure (coarse woody debris) important for denning habitat.

Several past and ongoing activities have positive effects on wolverine and wolverine habitat. Past decisions (shown by existing closures in Alternative A) closing areas of the Forest to off-road travel or snowmobile use have positive effects. The presence of roadless areas contributes to refugia for wolverines. The general trend in travel management decisions across the forest in

recent years has been to reduce the impacts of roads on wildlife through closures or decommissioning. Other past and ongoing activities, such as the development of Brundage Mountain Resort, have reduced the habitat suitability of the area for wolverine and their prey.

The Forest Service ongoing and reasonably foreseeable actions that may cumulatively affect wolverine, in addition to the Travel Plan, include recreation management, and future vegetation management projects (see Appendix D). In general, these actions would cumulatively benefit wolverine and wolverine habitat because Forest Service actions are required to provide suitable conservation of wolverine as a sensitive species. The Forest Plan also provides direction to conserve wolverine habitat. The Upper Elevation Groomed Route Improvement project has the potential to increase winter recreation in the area. Measures identified in this analysis to protect the corridors for habitat connectivity would guard against potential negative cumulative effects from future projects proposing expanded winter recreational activities.

Activities on adjacent private and state lands, such as housing and ski area developments, may factor into cumulative effects on wolverine habitat when they occur in more remote areas or alter winter habitats preferred by wolverines. The continued expansion of Tamarack Resort and the Brundage Mountain Land Exchange are likely to decrease wolverine habitat adjacent to the PNF.

Alternatives B, D and E are not expected to contribute to negative cumulative effects to wolverine or their habitat. Increased protection of habitat and primary travel corridors associated with added over snow closure areas are expected to incrementally benefit wolverine by reducing disturbance. Alternative C would have potential negative cumulative effects by allowing increased levels of use and disturbance in wolverine habitat and primary travel corridors especially in winter months. In summer, restrictions in cross-country travel associated with action alternative reduce the probability of disturbing wolverines, their habitat or prey resulting in an incremental improvement in protection of wolverine.

Effects Determination

The analysis reveals some habitat corridors important for connectivity are open to over-snow vehicle use. Due to remoteness, dense forest, or steep rocky cliffs that impede access, a majority of this habitat is mostly unavailable to a large volume of motorized over-snow traffic. Alternative D provides the greatest protection to wolverine from the effects of disturbance on denning habitat, as well as protection of four potential main corridors for habitat connectivity. Alternative E provides substantially more protection than the existing condition (Alternative A). These areas of greater protection best respond to Forest Plan direction and wolverine conservation needs. Alternative B does not respond directly to Forest Plan direction for wildlife nor would it improve habitat for wolverine because the proposed closures still are targeted for recreation use. Alternative C would not meet Forest Plan direction (see below) and would decrease the Forest's ability to provide habitat linkages in winter and conserve wolverine. Still, the data are lacking on whether this may result in declines in wolverine populations on the Forest. Even Alternative C would provide 22,960 acres of wolverine denning habitat. For this reason, any one of the alternatives ***may impact individual wolverine, but would not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.***

Forest Plan monitoring will help determine if additional provisions are needed to provide adequate secure wolverine denning habitat and protection from human disturbance in the main habitat corridors (Forest Plan monitoring element for sensitive species IV-11). Such monitoring will be particularly important if Alternative C is selected, because confidence in the accuracy of the above determination is low for Alternative C

Forest Plan Consistency Specific to Wolverine

WIST02 – Requires that projects are *designed and implemented within occupied habitats of sensitive species to help prevent them from becoming listed*…

The wolverine is a wide-ranging carnivore that is suited to extensive, remote, often high-elevation areas. Isolation from human disturbance and access to a diverse prey base seems to be important habitat components. Human disturbance during the winter can affect reproductive wolverines in different ways depending on the timing of the disturbance. Alternatives B, C, D, and E improve habitat conditions for wolverine in summer by restricting wheeled motorized travel to designated routes, which would reduce the potential for motorized disturbance in wolverine habitat. The action alternatives reduce the miles of open roads, and seasonally open roads. Alternatives B, D, and E also increase the acres closed to motorized over-snow travel. Alternative D provides the greatest protection of wolverine denning habitat and corridors from human disturbance in winter, particularly near to areas where wolverine have been detected in recent years. Alternative E also increases protected areas compared with No Action, but these areas are further from recent wolverine detection sites. In particular, Alternative E does not include the Bruin Mountain area, an area used by a wolverine in February 1995 (Wildlife Specialist Report: Project Record).

WIST03 - *Mitigate management actions within known nesting or denning sites of MIS or Sensitive species if those actions would disrupt the reproductive success of those sites during the nesting or denning period. Sites, periods, and mitigation measures shall be determined during project planning.*

Disturbance of wolverine denning habitat from over-snow vehicle use is the management action likely to have the greatest potential for adverse impacts on the reproductive success of wolverines. Closures in Alternative D would make such disturbance less likely. Closures proposed in Alternative E would also minimize opportunities for disturbance, but to a lesser degree. The Payette does not know of any actual wolverine denning sites, but if any were found they would be specifically protected.

WIST06 - *Mitigate human-caused disturbances within winter/spring ranges if disturbances cause displacement of wildlife while they are occupying those ranges.*

The discussion for WIST03 also applies to WIST06. Winter access also affects wolverines in non-denning habitat. Major impacts are associated with disturbance that could displace wolverine from foraging or resting areas, as well as access for fur trapping. Winter disturbance that results in forced movement of wolverines exerts an energetic cost at a time when energetic efficiency is critical. Alternatives D and E are both expected to substantially reduce the opportunity for disturbance to wolverine, but Alternative D provides better protection to wolverine and its prey from disturbance within their winter/spring range.

Direct and Indirect Effects - MIS and Sensitive Species

Northern Three-toed Woodpecker, White-headed Woodpecker, Pileated Woodpecker

Wildlife Issue 4: Travel management may affect habitat and/or populations of the pileated woodpecker (PNF MIS for large tree and snag dependent species), the white-headed woodpecker (MIS and Sensitive Species), and the three-toed woodpecker (Sensitive Species).

Indicators:

- Changes in habitat and potential effects on individuals and populations.

All Alternatives

The Travel Plan alternatives would have no direct effect on woodpecker species of concern – the northern three-toed woodpecker (a sensitive species), the white-headed woodpecker (a sensitive and MIS species) and the pileated woodpecker (a MIS species). Fire and disturbance events help create and maintain habitat for these species and the Travel Plan would have no effect on these disturbance processes.

Indirectly, the alternatives could result in minor changes to snags and down wood through the amount of access allowed to woodpecker habitat. Alternative A allows cross-country motorized travel on approximately 512,000 acres of the PNF. This access is likely contributing to firewood harvest leading to declines in snags and downed wood. In many areas, these declines are likely insignificant, but in some areas localized reductions in snags and down wood may be occurring.

The action alternatives would not permit cross-country motorized travel (except in an area 300 feet on either side of designated open roads and 100 feet on either side of designated trails), benefiting woodpecker habitat through reduced loss of snag/down log habitat and providing more security for individuals and populations.

Cumulative Effects

Past vegetation management projects have affected woodpecker habitat through removal of large trees and snags, and subsequent reduction of down logs. Current and future projects are guided by the Forest Plan to retain these important habitat components and benefit woodpecker species. For example, Forest Plan guidelines for snag and coarse woody debris retention would provide habitat for woodpeckers and other cavity-dependant wildlife species. Hence, reasonably foreseeable projects are not expected to contribute to cumulative impacts to woodpecker habitat.

Fuel reduction type projects would reduce the likelihood of stand replacement wildfire. While stand-replacing fires are important for three-toed woodpeckers, many fuel reduction projects are designed to occur in forests that historically did not experience stand replacement fires (such as ponderosa pine forests) so they historically did not provide much habitat for three-toed woodpeckers. These projects would improve habitat for white-headed woodpeckers. Other fuel reduction projects would be limited to areas around communities where public safety needs outweigh localized loss of woodpecker habitat.

Firewood gathering would continue across the forest and result in localized areas of reduced snag and future down log habitat. Action alternatives are likely to result in a cumulative decrease in the potential loss of snags/down logs because of the reduced area accessible to firewood gatherers associated with cross-country travel restrictions and reduced miles of road designated as open (i.e. unauthorized/unclassified roads no longer open to vehicles).

There are several residential developments and activities occurring in the foreseeable future adjacent to the Forest. It is likely the number of planned developments (such as houses, roads, and ski-area expansion) would reduce woodpecker habitat on private lands adjacent to the forest.

Under all action alternatives, the past, ongoing and reasonably foreseeable actions on the PNF (Appendix D) would likely maintain or benefit woodpecker habitat. Ongoing and future actions on adjacent private lands would likely result in localized reductions in woodpecker habitat. Cumulatively, woodpecker habitat would be maintained across the cumulative effects analysis area.

Effects Determination (for Sensitive Species)

All PNF Travel Plan alternatives ***may impact individual three-toed woodpeckers but would not likely contribute to a trend toward Federal listing or cause a loss of viability*** to the population or species.

All PNF Travel Plan alternatives ***may impact individual white-headed woodpeckers but would not likely contribute to a trend toward Federal listing or cause a loss of viability*** to the population or species.

Direct and Indirect Effects - Migratory Birds

Wildlife Issue 6: Travel management may affect migratory bird species.

Indicators:

- Changes in habitat and potential effects on individuals and populations

Background

Travel management can affect habitat fragmentation by dissecting contiguous vegetation types with road and trail corridors. Fragmentation effects have been reported to impact bird species in riparian habitat and grass/shrub lands (Joslin and Youmans 1999:3.22, 3.24), but most of the attention to this issue has been focused on fragmentation of forest habitat. Relatively few studies have considered the potential for narrow corridors (e.g., roads and trails) to produce fragmentation effects (Hickman 1990; Askins 1994; Rich et al. 1994; Miller et al. 1998; Hutto and Young 1999). Although it is recognized that road and trail corridors through continuous forest habitat can lead to increased nest predation rates since roads and trails provide travel corridors for predators to access forest interior from nearby open habitat (Joslin and Youmans 1999:3.23; Askins 1994:339). It appears that corridor width can influence nest predation. ; Studies (Rich et al. 1994; Askins 1994 and Hutto et al. 1995) have reported that narrow 26-33 feet road corridors had few notable impacts on nesting bird species, whereas wider corridors, particularly where shoulders were maintained with mowing, had more notable effects associated with nest predation and brood parasitism.

All Alternatives

None of the alternatives considered propose substantial changes in roads or trails. The major change in relation to habitat for migratory birds is the closure to motorized cross-country travel. In Idaho, habitats of concern for migratory birds include riparian habitat, non-riverine wetlands, sagebrush shrub, and dry ponderosa pine/Douglas-fir/grand fir forests. None of these habitats would be measurably impacted by any alternative. These habitats are protected by Forest Plan management direction, and in some cases legislation, hence no significant effects are anticipated from any management alternative (Additional information is provided in the Wildlife Specialist report, Project Record).

The greatest impact from loss of bird habitat due to travel facilities occurs in rare habitats such as riparian areas. These habitats also tend to support a high diversity of bird species, including many habitat specialists, relative to other habitat types available on the Payette National Forest. Riparian cover types on the Forest have been disproportionately affected by travel management and by other human uses such as recreation and livestock grazing.

Under alternatives C and E up to 6 miles of trail may require some construction. All alternatives allow relocation of existing trails to reduce soil and water impacts. Action alternatives B and D would reduce the miles of road corridor from the existing condition.

Additional impacts (such as the effects of disturbance) are addressed in the beginning of the Environmental Effects section under "General Effects…" Under all action alternatives, motorized travel would be restricted to designated routes. Limiting motorized use to designated routes would likely result in an overall reduction of non-motorized use, on and off-routes, simply due to a net decrease in access.

Cumulative Effects

Cumulative impacts to migratory birds occur from activities that modify habitat and/or contribute to disturbance factors. Such activities include timber harvest, fuel reduction projects, prescribed and natural fires, fire suppression, livestock grazing, dispersed and developed recreation, mineral extraction, noxious weed spread, housing and agricultural development on public and private land.

Changing habitat structure through fuel reduction projects could ultimately influence bird species composition in treated areas. Mitigation and effects to migratory birds would be analyzed on a site specific basis.

Spring burns occur during the nesting season when birds are vulnerable, and could result in reproductive failure for some individuals.

Forested landscapes in the inland western states have historically been shaped by dynamic disturbance processes such as widespread fire and insects and disease, resulting in a naturally-fragmented landscape compared to the more homogenous forest habitats of the eastern United States and Pacific Northwest. Human-induced habitat modification in the inland west has been a function of timber harvest and fire suppression. In general, western populations of migratory bird species have faired better than eastern North American populations (Dobkin 1992).

None of the action alternatives considered proposes substantial changes in roads or trails. In all action alternatives, project design features (Chapter 2) maintain or protect riparian areas (primary habitat for many migratory bird species) and restrict cross country motorized travel. For these reasons, negative cumulative effects on migratory birds are unlikely.

Effects Determination

Minimal habitat modification would take place under the alternatives proposed for the PNF Travel Plan. All PNF Travel Plan alternatives ***may impact individuals and habitat, but would not indicate a local or regional change in habitat quality or population status*** of migratory birds.

Direct and Indirect Effects - Elk

The potential effects of the Travel Plan alternatives on elk are analyzed according to elk seasonal habitat needs: summer range, security habitat during the hunting season, and winter range.

Wildlife Issue 1: Motorized travel may affect summer and winter elk habitat and elk vulnerability during hunting season.

Summer Range

Indicators

- Acres open to cross-country motor vehicle use in summer.
- Density (miles of road and motorized trail/square mile of area) of open NFS roads and motorized trails by watershed (5th hydrologic unit) in summer.

Introduction

The quality of summer range is one of the more important variables in determining annual variation of herd growth. Management of summer range includes consideration of disturbances that might discourage elk use of an area (Van Dyke et al. 1994).

Roads cause direct loss and fragmentation of habitat. A typical 30-foot wide forest road including cut and fill is estimated to reduce habitat by 3.5 acres per mile. However, considerably more area adjacent to roads is only partially used by elk due to road avoidance behavior. Researchers have reported decreased use of areas adjacent to roads for distances ranging from 0.25 to 0.5 miles (Perry and Overly 1997, Ward 1976). This avoidance response may restrict individuals to marginal habitats, which can reduce nutrition and productivity.

Habitat fragmentation resulting from forest roads and related management activities affects the juxtaposition of cover and foraging areas. Probably the most significant impact from forest roads is access and increased human disturbance, harassment and human-caused mortality. Impacts of roads on potential effectiveness of summer elk range (Perry and Overly 1997) show up to a 50 percent loss in habitat effectiveness when road densities exceed 2 miles per square mile of elk habitat. Forest Plan objectives 0246, 0334, and 0638 in MA 2, MA 3, and MA 6 call for reduced open road density for elk (Forest Plan 2003).

The energetic demands of elk for growth, development, and lactation are high during the summer months as elk are simultaneously recovering from weight lost during the previous winter, supporting young of the year through lactation, and building fat reserves for the coming winter. Motorized activities impact elk through direct disturbance, displacement from or reduction of high quality selected habitats resulting in lowered reproductive performance, and indirect impacts from noxious weed establishment (Grover and Thompson 1986, Hamilton 1997, Rowland et al. 2000, Ward and Cupal 1979).

Wisdom et al. (2000) indicate that off-road recreation (motorized and non-motorized), increases movement rates and flight responses for elk. Effects are more pronounced in response to OHV and mountain bike riding verses horseback and hiking activities. Elk energy reserves may be reduced as a cost of fleeing from an off-road activity due to increased movement and displacement from foraging habitat. It is during the summer that elk body condition improves due to the quality and quantity of summer forage that provides stores of fat; the energy that keeps them alive when food is scarce in winter.

Alternative A – No Action

Under Alternative A, more than 500,000 acres would remain open to motor vehicle use. Much of this use occurs on non-system or “ghost” roads that are not officially recognized and receive no maintenance or management. The total amount of these roads on the PNF is unknown, but surveys in some watersheds have found these roads may double the total miles of roads in the watershed. Allowing travel off open system roads results in another problem because the PNF also manages many miles of closed system roads. While these roads are tracked and receive some maintenance, they are officially closed to travel (often due to previous analyses that identified high road densities as a problem to elk and other wildlife species). Many of these roads are not gated or signed as closed, so when they occur in an area open to cross-country travel, they are often used by unknowing recreationists. This use of closed system roads, in addition to use of unauthorized roads, can greatly increase the actual effects of roads and road densities on elk.

Under Alternative A, elk would also continue to experience adverse effects from indiscriminate cross-country motor vehicle use. Such travel is restricted somewhat by vegetation and topography, but more vulnerable areas, such as meadows and wetlands, are accessible and often

receive the greatest use. The acres of each management area that would remain open and closed to cross-country vehicle use are displayed in Table W-12.

Table W-12: Acres Open to Cross-country Motor Vehicle Use under Alternative A

Management Area	Acres Open	Acres Closed
1	0	35,049
2	70,016	81,565
3	225,167	74,480
4	11,135	50,993
5	30,148	5,424
6	36,506	41,002
7	31,131	69,424
8	12,466	21,826
9	3,236	80,502
10	41,471	64,344
11	23,309	60,260
12	24,604	334,284
13	0	100,247
Total	509,189 Acres*	1,019,400 Acres

*Total slightly differs from acres reported elsewhere due to inherent small variations in GIS analysis capabilities

Action Alternatives B, C, D, and E

The action alternatives would not permit cross-country motor vehicle use except in an area 300 feet on either side of designated open roads and 100 feet on either side of designated trails. This would greatly decrease impacts on elk behavior and improve habitat security.

Closing the Forest to cross-country travel is the single most effective action for protection of elk habitat and security. In addition, each action alternative would reduce the density of roads and motorized trails to some degree.

Road and Motorized Trail Densities

The initial analysis in the DEIS noted that many watersheds contain large roadless areas (IRAs) and choose to exclude IRA acres from the area calculation. This method elucidated some aspects of roads and trails, for example, that in some instances roads are concentrated in a very small area compared to the entire watershed, but the method was not comparable with other analyses of road density performed for ESA biological assessments and the analysis of the Forest Plan.

In the FEIS, the analysis was revised to follow standard methods evaluating road density for the entire portion of the watershed (including IRAs) on NFS land. Summer road and motorized trail density (miles/square mile) was calculated by watershed at the 5th hydrologic unit (HU) scale and is displayed in Table W-13. Watersheds that contained less than 1,000 acres of NFS land were not analyzed due to the tendency for bias in such a small area calculation.

Alternative A – No Action

In summer, the density of authorized roads and motorized trails is less than 2 miles per square mile in all watersheds except Pine Creek (2.1 mi/mi.^{2}), Goodrich-Bacon (2.2 mi/mi.^{2}), West Fork Weiser (3.0 mi/mi.^{2}), and Upper Weiser River (2.2 mi/mi.^{2}) (Table W-13).

Action Alternatives B, C, D, and E

The four watersheds where road and motorized trail densities exceed 2 miles per square mile in Alternative A do not improve appreciably in any of the action alternatives (see Table W-13). Alternative C results in the greatest increase in densities. Alternatives B and D would provide the

most improvement, but all four watersheds would still exceed 2 mi/mi.², with the exception of Pine Creek, which drops to 1.9 mi/mi.² in Alternative D. Alternative E falls in between the other alternatives.

Table W-13. Watersheds Where Summer Road and Motorized Trail Densities Exceed Two Miles per Square Mile by Alternative.

Watershed	Alt. A	Alt.B	Alt. C	Alt.D	Alt. E
	Density (mi/mi.²)				
Pine Creek	2.1	2.0	2.1	1.9	2.1
Goodrich-Bacon	2.2	2.0	2.1	2.0	2.2
West Fork Weiser	3.0	2.9	3.1	2.9	3.0
Upper Weiser River	2.2	2.1	2.3	2.3	2.1

Elk Vulnerability During Hunting Season

Indicators

- Acres open to cross-country motor vehicle use in fall.
- Density (miles of road and motorized trail/square mile of area) of open NFS roads and motorized trails by watershed (5th hydrologic unit) in fall.
- Percent of elk security habitat available during hunting season by Elk Analysis Area (EAA) on NFS land.

Introduction

National Forest System lands provide substantial habitat for elk populations, as well as opportunities for hunting. During the hunting season, elk management balances the protection of certain sex and age classes with the need to provide hunting opportunities. While IDF&G has the primary role in this management, the Payette National Forest strives to compliment these objectives through management of open road densities and other activities that may impact elk populations.

The Forest lies within four Idaho Department of Fish and Game (IDF&G) Elk Zones. The Elk Zones include Brownlee, Weiser River, McCall, and Middle Fork. On the PNF, portions of 11 Big Game Management Units occur within these four Elk Zones. The IDF&G has identified herd management objectives for each of the Elk Zones and for some units (Table W-3). Elk vulnerability is a concern for several units on the Forest (J. Rohlman, pers. comm. with A. Kuehl, 2005).

Current populations of elk on the Forest are estimated by IDF&G at regular intervals, though numbers of elk can change during the year. Elk populations on the Forest are highest during the spring and summer, as elk migrate back from winter range areas and calves are born (Unsworth et al. 1993, Christensen et al. 1995, IDFG 1999). Forest Service management actions such as travel management, road construction or obliteration, and vegetation management can influence mortality rates during the hunting season.

Forested vegetation is an important consideration for management of elk populations during the hunting season (Hillis et al. 1991, Lyon 1983, Lyon and Canfield 1991). Road density and pattern,

including off-road travel, play an important role in determining the security level an area provides to elk during the hunting season. An area with sparse cover and low road densities may provide as much security as the same sized area with heavy cover and high road densities (Lyon et al. 1985).

Several studies document the effect of roads on elk vulnerability, security, population structure, and hunter success (Edge and Marcum 1991, Leptich and Zager 1991, Unsworth and Kuck 1991, Gratson and Whitman 2000). While most studies indicate that roads impact elk, and road closures can extend and affect hunter success, at least one study indicates that road closures do not alter hunter success (Burbridge and Neff 1976 as cited in Gratson and Whitman 2000). Few considerations in forest management appear to provide a better opportunity for immediate mitigation in the management of elk habitat than road closures (Lyon et al. 1985).

Elk vulnerability is an important component of the IDF&G's management goals and objectives. Restricted motorized travel in locations where elk lack secure habitat due to road densities and/or lack of cover during the hunting season has been established on the PNF to reduce antlered elk vulnerability during the general rifle season. Motorized road and trail densities (miles/square mile) as well as cross-country motorized access are parameters that can be used to determine elk vulnerability.

Elk vulnerability may be reduced, and hunter opportunity may be increased, by providing security areas for elk during the hunting season. Elk habitat security areas are defined as a nonlinear block of hiding cover ≥ 250 acres in size and ≥ ½ mile from open roads and motorized trails. Collectively, these blocks must equal at least 30 percent of the analysis area (Hillis et al., 1991).

In the DEIS, the analysis area was defined as the Big Game Unit. Nine of the eleven Big Game Units on the PNF were analyzed for elk vulnerability during hunting season (since only one percent of unit 32 and 18 percent of unit 31 occur on the Forest they were not included in the analysis). At the request of IDF&G, the analysis areas were changed to the 5th level HU watershed scale (either individual watersheds or combinations to equal about 30,000 to 80,000 acres in size). This area, called the Elk Analysis Area (EAA) reflected agreements made in 2005 between IDF&G and district biologist (Wildlife Specialist report: Project Record). Twenty-seven EAAs were identified in the project area.

Alternative A – No Action

Currently, slightly more than 500,000 acres on the Forest are open to cross-country motor vehicle use in fall, although not all these acres can be traveled due to limits imposed by vegetation and topography. In fall, the density of authorized roads and motorized trails (miles/square mile of NFS land in the 5th HU watershed) is less than 2 miles per square mile in every watershed due to application of seasonal road closures.

Eighteen of the 27 EAAs (mostly on the east side of the Forest) contain more than 30 percent of their area more than ½ mile from open roads and motorized trails. Of these, only three EAAs are comprised of hiding cover blocks ≥ 250 acres in size that total at least 30 percent of the area.

Under Alternative A, there are many unauthorized roads used by off-road vehicles in currently open areas. Seasonal road closures during hunting season have also been difficult to enforce. These open areas further decrease elk habitat security.

Action Alternative B, C, D, and E

The action alternatives would not permit cross-country motor vehicle use except in an area 300 feet on either side of designated open roads and 100 feet on either side of designated trails. This would greatly decrease impacts on elk behavior and habitat security. Closing the Forest to cross-country travel is the single most effective action for protection of elk habitat and security.

In fall, the density of authorized roads and motorized trails (miles/square mile of NFS land in the 5th HU watershed) remains less than 2 miles per square mile in every watershed and would not improve appreciably in any of the action alternatives. Alternatives B and D would provide the most improvements although benefits are slight.

The action alternatives do not result in substantial changes to elk habitat security. Alternatives B and D result in slightly more improvement in elk security compared with the other alternatives. The percentage of elk security is lowest on the west side of the Forest, where road density numbers are the highest. The amount of cover these security areas afford varies throughout the PNF (see Wildlife Specialist Report: Project Record).

Although not measured in the indicator for elk security, all the action alternatives would provide far greater benefits than Alternative A, because all currently open areas would be closed to cross-country motor vehicle use.

Winter range

Indicators

- Miles of groomed snowmobile routes within elk winter range.
- Acres and percent of elk winter range open to over-snow vehicle use.
- Direct and Indirect Effects

Elk populations are lowest during the winter after they migrate to lower-elevation winter range following the hunting season in the fall. Additional mortality usually occurs on winter ranges, depending on forage quantity and quality, predators, and the severity of the winter. Mild winters contribute to higher elk numbers.

Winter range is an important element of elk habitat. Areas with minimal human activities and adequate forage will reduce the energetic costs associated with over winter survival. Snowmobile traffic is one form of disturbance that has potential impacts on wintering elk. Elk respond to human disturbance through overt expressions such as an increase in general alertness to a slow retreating movement to outright flight, depending on the type of disturbance (Canfield et. al. 1999). This can result in reduction in over-winter survival and subsequent reproductive success.

Winter range travel restrictions are intended to prevent disturbance and harassment of elk during a period when physical stress is already relatively high. Because of the importance of winter ranges to elk, the Forest has closed elk winter range to over-snow vehicle use.

Alternative A – No Action

Currently there are 4.55 miles of groomed snowmobile route within elk winter range. About 105,000 acres of elk winter range are closed and 81,000 acres are open to over-snow motorized use, but the open acres largely fall below the average snowline (estimated at 4,000 feet) and so are generally not impacted by snowmobile use.

Action Alternatives B, C, D, and E

None of the action alternatives would increase the miles of groomed snowmobile routes within elk winter range from the existing condition of 4.55 miles. The potential for disturbance from groomed snowmobile trails on elk winter range would essentially remain the same under all alternatives.

The Forest has an estimated 186,300 acres of elk winter range (Wildlife Specialist Report: Project Record). In alternatives A and B, 43 percent of this elk winter range would be open to over-snow

vehicle use compared with 48 percent in Alternative C, 39 percent in Alternative D, and 41 percent in Alternative E (Table W-14). It should be noted that many open acres fall below the average snowline (estimated at 4,000 feet) and so are generally not impacted by snowmobile use.

Table W-14: Acres and Percent of Elk Winter Range Open to Over-snow Motor Vehicle Use by Alternative

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
81,000 (43%)	81,000 (43%)	90,200 (48%)	72,700 (39%)	76,000 (41%)

Alternative C would open the most acres and Alternative D would close the acres of elk winter range to over-snow vehicle use. Winter range is an important element of elk habitat. Areas with minimal human activities and adequate forage will reduce the energetic costs associated with over-winter survival. Alternative D would have the least amount of impact to wintering elk.

Cumulative Effects

Several past and ongoing activities have positive effects on elk habitat. Past decisions that closed roads, whether year-round or seasonally, have positive effects for elk and elk habitat. The existence of roadless areas in some watersheds also contributes to elk security.

The Forest Service ongoing and reasonably foreseeable actions that may cumulatively affect elk include this Travel Plan, recreation management, and future vegetation management (Appendix D). A number of projects, including the Brownlee/Seid Creek Improvement Thin, Burgdorf Road Management and Abandoned Mine Reclamation, Lick Creek Vegetation Management Project, Upper Weiser Fire Regime/Condition Class Project, Crooked River Fuels Management Project, Meadows Slope Wildland Fire Protection Project, Paddy Flat Vegetation Management Project, Summit Gulch Vegetation Management Project, and Yellow Pine Hazardous Fuels Reduction propose to close and decommission roads. Any reduction in road density would benefit elk.

Cross-country motor vehicle use and motorized travel on unauthorized roads in open areas would continue in Alternative A. This would continue to negatively affect elk habitat effectiveness and elk vulnerability.

Alternatives B, C, D, and E would eliminate motorized travel on more than 500,000 acres, cumulatively benefiting elk and elk habitat.

Alternative C would open additional acres in elk winter range to over-snow vehicle use. This may have slight cumulatively negative effects on elk over-winter survival when combined with actions on adjacent private lands. Planned Tamarack Resort activities for winter use would have no cumulative impacts on elk winter range.

Forest Plan Consistency Specific to Elk

All action alternatives considered in this analysis would reduce elk vulnerability and improve habitat security by closing the Forest to cross-country travel on more than 500,000 acres. Given this, all action alternatives are consistent with Forest Plan direction related to elk. Opportunities to improve elk security through additional road closures should continue to be investigated.

In response to concerns about elk security expressed by the Idaho Department of Fish and Game a monitoring was added to this project (Chapter 2). The monitoring would determine the effectiveness of closures in areas where elk habitat security is a concern (as identified in coordination with IDF&G). Field evaluation and/or photo-monitoring would be used to determine occurrence of off-road travel and use of unauthorized roads and motorized trails during hunting

season in these areas. Potential solutions to continued illegal access could include increased law enforcement patrols, physical road closures, and road decommissioning.

Irreversible and Irretrievable Commitments for all Wildlife Species Analyzed

Permanent facilities or associated wildlife habitat are not changed in any watershed containing TES or MIS species to an extent that loss of wildlife production occurs for an implemented action. Irreversible loss of wildlife production would only occur in a case where an action was implemented that caused permanent loss of some wildlife production. Irretrievable commitments of habitat components for wildlife would be limited to vegetation removal associate with road or trail maintenance or construction activities. These commitments would occur in isolated areas scattered across the forest, and as such, are not expected to impact wildlife production. Avoidance of this would be insured through maintenance of habitat for wolverine and lynx and through adherence to Forest Plan direction.

Project Record

The *Wildlife Specialist Report* in the Project Record is incorporated into this EIS (40 CFR 1502.21). The wildlife specialist relied on the detailed data, methodologies, analyses, conclusions, maps, references, and technical documentation in the *Wildlife Specialist Report* to make the conclusions presented in this EIS.