Appendix D – Biological Evaluation

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Reply To: 2430/2672 **Date**: August 29, 2007

Subject: Misery Lake Timber and Fuels Management Project:
Biological Evaluation of Effects to Terrestrial
Threatened, Endangered, and Sensitive Species

To: Betty Mathews: District Ranger

I. INTRODUCTION

This document is an analysis of the effects of the proposed Misery Lake Timber Sale and Fuels Management Project on terrestrial threatened, endangered and sensitive (TES) wildlife species. The USDI Fish and Wildlife Service (FWS) lists the following species for the Colville National Forest as threatened or endangered under the Endangered Species Act of 1973 (FWS reference: 1-9-05-SP-0272); bull trout (*Salvelinus confluentus*), Canada lynx (*Lynx canadensis*), gray wolf (*Canis lupus*), grizzly bear (*Ursus arctos*), and woodland caribou (*Rangifer tarandus caribou*). On August 8, 2007, the FWS officially removed the bald eagle (*Haliaeetus leucocephalus*) from the threatened and endangered species list, owing to the successful recovery of eagle populations throughout their range. Table 1 displays the listed species that will be addressed in this document.

Table 1. Misery Lake Project Area habitats for threatened (T) and endangered (E) species. (Species in shaded blocks are addressed in this report.)

Species	Status	Habitat Present?	Comments
bull trout	T	Yes	Effects to this species are covered in the fish biologist's report for this project.
Canada lynx	T	No	The project area lies below the primary range of Canada lynx. If lynx were to use the area at all it would be during dispersal movements between areas of suitable habitat.
gray wolf	E	Yes	Project area is outside recovery habitat. This species is closely tied to habitats that support abundant big game populations. Limiting human-caused mortality is a primary management concern.
grizzly bear	T	Yes	Project area is outside recovery habitat. Spring forage habitats include low – mid elevation riparian areas, meadows, parklands, etc.. Summer / fall foraging sites include mid - high elevation, berry producing shrub fields. Grizzlies often den in alpine / subalpine areas with deep soils. Seclusion from human disturbance is a primary management objective.
woodland caribou	E	No	Project area is outside recovery habitat, and at lower elevations than what is presently considered potential caribou range. Timber stands in the project area are predominantly warmer / drier forest types that do not provide suitable habitat for caribou.

The USDA Forest Service (FS) maintains a list of sensitive species for each National Forest. Sensitive species are those whose population viability is a concern because of:

- Significant current or predicted downward trends in numbers of animals, or
- Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

The Misery Lake Project Area or adjacent lands could provide habitats for the following sensitive terrestrial wildlife species listed for the Colville National Forest; bald eagle, common loon (*Gavia imner*), eared grebe (*Podiceps nigricollis*), fisher (*Martes pennanti*), great gray owl (*Strix nebulosa*), northern leopard frog (*Rana pipiens*), peregrine falcon (*Falco peregrinus*), sandhill crane (*Grus canadensis*), Townsend's big-eared bat (*Corynorhinus townsendii*), and wolverine (*Gulo gulo luteus*). Effects of the Misery Lake project on sensitive plant and fish species will be addressed in separate reports. Table 2 displays the sensitive species that will be addressed in this document.

Table 2. USDA Forest Service (Region 6) Sensitive Wildlife Species listed for the Colville National Forest (Species in shaded blocks are addressed in this report.)

Species	Habitat Present?	Comments
bald eagle	Yes	Eagles forage on rivers and large lakes with abundant fish, (ex. Pend Oreille River). For nesting / perching, they select large trees that stand above the main forest canopy, and usually within one mile of a foraging area. Winter roosts may in late and old structural stage stands with good canopy closure.
common loon	Yes but on private lands	Potential nesting / foraging / brood rearing habitat exists only on the Pend Oreille River and adjacent private lands. Loons have only been known to use the river corridor during migrations.
fisher	Yes	Fishers inhabit dense coniferous or mixed coniferous/deciduous forests with good canopy closure. They prefer late and old structural stage stands. Travel habitat inlcudes forest stands adjacent to lakeshores, riparian areas, ridges. Fishers den in large hollow logs or snags, tree cavities, brush piles etc.
great gray owl	Yes, but nesting not confirmed	This owl forages in open, grassy habitat including open forest stands, selective and clear-cut logged areas, meadows and wetlands. They nest in forest stands near wet meadows, pastures and other openings. Nest structures include large, broken topped snags and abandoned raptor nests.
northern leopard frog, eared grebe, sandhill crane	Yes, but nesting not confirmed	These species require wetland and pond habitats with much concealing cover. Sandhill cranes nest on isolated, large tracts of marshes and meadows more than ¼ mile from roads.
Townsend's big-eared bat	Yes	This bat uses caves or mine adits for roosting / hibernation. Nursery colonies are often in old abandoned buildings.
wolverine	Yes	Wolverines typically den in higher elevation rock slides, caves, and crevices; often in glacial cirque basins. They forage in all forested habitats but particularly those where carrion can be found. They require seclusion from human disturbance.
peregrine falcon	Yes but on private lands	No tall cliff faces or other rock features that peregrines could use for nesting exist in the project area. Nesting by this species has not been documented on the Forest. Foraging habitats are located on the Pend Oreille River and adjacent private lands.
pygmy whitefish, west-slope cutthroat, redband trout	Yes	Effects to these species are covered in the fish biologist's report for this project.
sensitive plants	Yes	Effects to these species are covered in botanist's report for this project.

II. PROJECT AREA DESCRIPTION

The Misery Lake Project Area is located within the Lost and Ruby Creek drainages. The project area is bounded to the north by the South Fork of Lost Creek, to the east by the Pend Oreille River, to the west by a section of Ruby Creek, and to the south by a ridge that divides the Misery Lake and Gardiner Creek drainages. The project area contains Misery Lake, which is about five acres in size.

Most of the project area lies below 3,200 feet in elevation. Highways, power line corridors, home sites, pastures, fields, etc. exist on much of the low-elevation, private lands along the Pend Oreille River.

The Colville National Forest Land and Resource Management Plan (USDA, 1988), hereinafter referred to as the Forest Plan, divided the forest into several different "Management Areas" (MAs), each with its own management emphasis. Table 3 lists the MAs within the project area.

Table 3. Forest Plan Management Areas in the Misery Lake Project Planning Area.

Forest Plan Management Area	Management Emphasis	Acres
MA1	Old Growth Associated Species Habitat	630
MA5	Scenic/Timber	1,984
MA6	Scenic / Big Game Winter Range	2,531
MA7	Wood / Forage Production	2,198
MA8	Big Game Winter Range	2,448
Total National Forest System Land		9,791
Private land		4,302
Misery Lake Project Planning Area		14,093

A. Past Forest Management – The following description of past management is adapted from the Silvicultural Report for the Misery Lake Project Planning Area (S. Brogan, 2006).

In the 1930s, large wildfires burned over much of the standing timber in the Misery Lake Project Area and the larger, Lost and Ruby Creek watersheds. Some of the trees that survived the fires were then logged. Timber harvest focused on the larger diameter western redcedar, western white pine, western larch and ponderosa pine trees. Stumps throughout the watersheds indicate that historically, these species existed in higher numbers and were of larger average diameter than the present condition. White pine blister rust further reduced live white pine trees in the watersheds. Only the white pine trees growing in more recent plantations are from rust resistant stock. Grazing by cattle and big game reduced the return of western redcedar to riparian areas. Lodgepole pine was able to quickly colonize many burned sites in the watersheds. Currently in the Lost and Ruby Creek watersheds, lodgepole pine stands cover a larger area than was the historic condition.

Timber harvest on National Forest System (NFS) lands in the watersheds began in the 1960s. Past harvest activities on all ownerships in the Misery Lake Project Area are displayed in Table 4.

Table 4: Past harvest activity in the Misery Lake Project Planning Area

Harvest Rx	NFS Acres Harvested (percent of total)	Pvt. Acres Harvested (percent of total)
Clearcut (HCC)	173 (29)	129 (6)
Clearcut with reserve trees (HCR)	255 (43)	325 (15)
Shelterwood (HSH)	12 (2)	922 (43)
Selection harvest (HSG)	107 (18)	0
Special cut (HSP)	40 (7)	126 (6)
Commercial thinning (HTH)	9 (1)	152 (7)
Sanitation harvest (HSV)	0	492 (23)
Total	596 (100)	2,146 (100)

Past silvicultural prescriptions employed in the area included:
Clearcut – All overstory trees were removed.
Clearcut with reserve trees – All overstory trees were removed except 4-12 trees per acre left as seed sources / wildlife habitat.
Shelterwood – All overstory trees were removed except 12-30+ trees per acre left to shelter advanced regeneration.
Selection harvest - Individual trees or small groups of trees were removed to provide for an orderly development of trees with a range of ages. A high degree of forest canopy was maintained.
Special cut - Some trees were cut from an area for other than silvicultural purposes.
Commercial thin - Approximately one third of the stand basal area was removed (typically suppressed, intermediate and co-dominant trees)
Sanitation harvest – Recently dead and dying trees were removed.

B. Current Vegetation - The following description of vegetation conditions is adapted from the Silvicultural Report for the Misery Lake Planning Area (S. Brogan, 2006).

Forest stands that developed after the fires of the 1930s were uniform in age and structure in many portions of the Lost and Ruby Creek watersheds. Over the past 70 years, forest fires were suppressed in the area. Wildfires often thin stands and reduce inter-tree competition for sunlight, water, and soil nutrients. In the absence of fire or other major disturbance, some stands have become densely stocked with small diameter (eight inches or less) trees. Fire suppression also contributed to the development of dense understories of shade tolerant tree species (western redcedar, western hemlock, grand fir) in many stands.

Overstory trees within the watersheds typically range from 65 to 85 years old. Lodgepole pine (LP) is a major component of many stands in the area, composing more of the overall tree biomass than it did historically. This species is relatively short-lived and adapted to stand replacing fires. LP trees have

grown to the size where they are susceptible to mountain pine beetle attacks. LP stands succumbing to insect or disease attack and overall senescence can provide the fuel for future, stand replacing fires. Such fires expose bare mineral soils which provide ideal growing sites for LP seedlings. The presence of over-stocked stands, stands with dense understories of shade tolerant trees, and LP trees passing their prime, all favor stand-replacing fires which tend to perpetuate these conditions.

Quaking aspen and paper birch are declining in vigor and beginning to drop out of the species mix in the watersheds. These trees are relatively short-lived (typically less than 100 years). They are maintained on the landscape by moderately frequent disturbances, such as wildfires. Large stands of paper birch in the area have been top-killed by bronze birch borers. As these hardwoods decline, the seed source available to regenerate them may be lost.

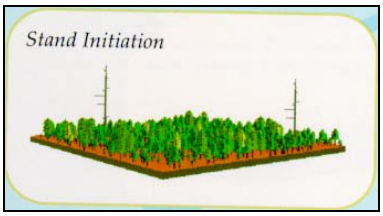
Figure 1. Densely stocked, small diameter stand.

Figure 2. LP stand with large stump from logging in the early 1900s.

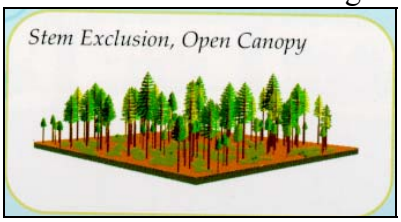
Major plant associations in the watersheds are in the western redcedar, western hemlock, Douglas fir and grand fir series. Plant associations refer to the potential tree and understory communities that would develop over time in a stand in the absence of disturbance (such as fire). More detailed information related to the individual plant associations can be found in "Forested Plant Associations of the Colville National Forest" (Williams, et al, 1995).

1. Stand Structural Stages - There are seven structural stages identified in the Regional Forester's Forest Plan Amendment #2: Revised Standards for Timber Sales on Eastside Forests (Lowe, 1995).

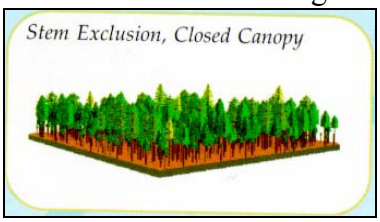
Forest Structural Stage 1



Forest Structural Stage 2

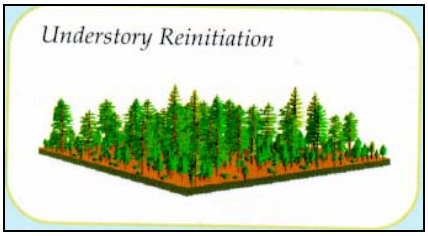


Forest Structural Stage 3

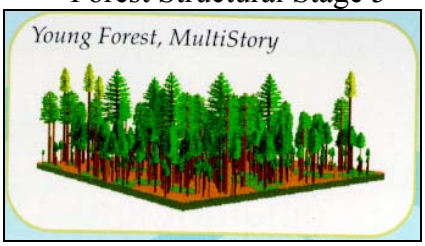


Stand Initiation through Stem Exclusion (Stages 1-3). These early stands are fully stocked with conifer trees that may range in size from seedlings through 15" diameter trees. The distinguishing characteristic is that all the trees are near the same age (same cohort), and all the trees are in the same canopy layer. A second canopy layer of shade tolerant trees has not yet started to develop in the understory.

Forest Structural Stage 4

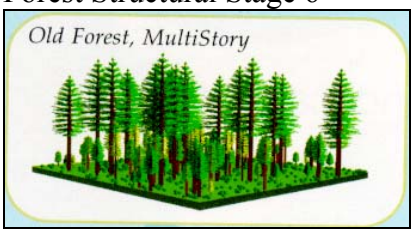


Forest Structural Stage 5

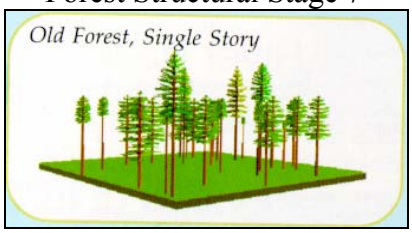


Understory Re-initiation and Multi-Stratum without Large Trees (Stages 4 & 5). A second cohort of trees is established under an older overstory in these middle stages. Openings start to appear in the canopy, and the amount of down wood increases. The trees in the overstory are typically sun-loving (larch, pine, Douglas-fir, etc.) while the trees in the understory are typically shade-tolerant (western redcedar, hemlock). The stand may contain many sizes of trees, but large trees are uncommon.

Forest Structural Stage 6



Forest Structural Stage 7



Multi-stratum with Large Trees (Stage 6). These late and old structural stage stands contain two or more cohorts of trees, and trees of all sizes are present. The overstory canopy is discontinuous, and dominated by large trees

Single-Stratum with Large Trees (Stage 7). A single layer of large seral trees is present in this late and old stage. The understory may be absent or may contain sparse or clumpy seedlings and saplings. These stands are often park-like in appearance.

Table 3 displays the historic and current stand structural stage mix in the Lost and Ruby Creek watersheds, by biophysical environment. Note that while subalpine fir plant associations occur in the watersheds, they do not occur in the Misery Lake Project Area. Historically, late and old structural stage stands occupied much more of the forested area in the watersheds than the present condition.

Table 5. Existing stand structural stages in the Lost and Ruby Creek Watersheds

Biophysical Environment	Early Stages 1, 2, 3		Middle Stages 4, 5		Late and Old Stages Stage 6		Stage 7	
	H%	C%	H%	C%	H%	C%	H%	C%
Cool, mesic, Douglas fir / grand fir / forb-shrub Warm, dry Douglas fir /shrub	15-35	26	20-50	72*	20-30	2*	10-25	0*
Cold, dry, mesic, subalpine fir /shrub	15-40	26	35-72	62	10-30	12	2-5	0*
Cold, mesic, subalpine fir / tall shrub	10-35	15	30-60	85	25-50	0*	NA	0
Cool, mesic, western redcedar / western hemlock / forb-shrub	10-30	24	20-50	75*	30-70	1*	NA	0
Very moist bottoms western redcedar / western hemlock	5-30	15	10-50	84*	30-90	1*	NA	0

H = Historic Range
C = Current Condition
* = Denotes currently outside of the Historic Range of Variability

2. Old Growth Forest - As directed by the Regional Forester in a letter dated December 3, 1992 and by the Forest Supervisor in a letter dated April 5, 1993, we surveyed the Misery Lake Project Planning Area for old growth forest stands using the North Idaho Zone definitions (Green et al, 1992). No stands that currently meet the North Idaho Zone definition for old growth were identified in the project area.

C. Existing Transportation System - Table 6 displays the miles of roads and trails within the Misery Lake Project Area.

Table 6 – Misery Lake Project Area existing motorized route data

Land Ownership	Motorized route miles			
	open	restricted	impassable	trails
NFS	14.8	4.6	10.7	7.1
state	7.8	0	0	0
county	5.3	0	0	0
private	11.2	3.4	5.9	0
Totals	39.1	8.0	10.7	7.1

Motorized route categories include:
open roads
restricted roads - closed with a gate or guardrail barricade. On NFS lands, administrative access by Forest Service employees or contractors is allowed for forest management activities.
impassable roads - brushed-in, or have earthen berms or boulders on their entrances. These routes can still be recognized as roads, but are no longer safely and prudently drivable, and are not being used by motorized vehicles.
motorized trails – in the Misery Lake Project Area, these are all user-created trails. Most of these are on old, closed roadbeds.

III. PROPOSED FOREST MANAGEMENT ACTIVITIES

A. Alternative A

This is the "no action" alternative. No forest management activities would occur with this alternative beyond programmatic activities (such as road maintenance and livestock grazing) that are not related to this project.

B. Alternative B

Alternative B is the proposed action. This alternative would include prescribed burning, commercial timber harvest, and pre-commercial thinning / pruning of sapling to pole sized conifers. These activities would be primarily designed to:

- Reduce forest fuel loads and restore fire to its historic function across the landscape,
- Reduce the susceptibility of trees to insects and diseases by reducing stand density,
- Limit the magnitude of future mountain pine beetle outbreaks by removing lodgepole pine trees that are susceptible to beetle attack (based on their diameter and age),
- Restore early seral tree species (ponderosa pine, western larch, western white pine) that have been dramatically reduced by past over-harvest, fire suppression, and white pine blister rust,
- Promote additional "late and old" structural stage stands and otherwise move the area closer to its Historic Range of Variability (HRV) for stand structural stages.

Table 7 displays the various commercial and non-commercial forest management activities proposed with Alternative B.

Table 7. Proposed vegetation management in the Misery Lake Project Area

Timber Harvest	**Approximate acres**
commercial thin	1880
selection harvest	292
shelterwood	643
Total timber harvest	2815 acres (23.7 MMBF)

Logging System	
ground based	2338
helicopter	298
skyline	179

Non-commercial Treatment	
fuels/fire	392
mechanical fuel	1425
pre-commercial thin / WP prune	223
pre-commercial thin	204
under-burn	4380
Total noncommercial treatment	6624

1. Timber Harvest Prescriptions - The three proposed harvest prescriptions are described below. Harvest units might have a single prescription, or a combination of two prescriptions, depending on natural variations in the stand. For example: portions of a given stand with trees that would respond well to thinning would be thinned, while areas of stagnant and suppressed trees would be harvested using a shelterwood prescription.

Commercial Thin (HTH) – Thin out the suppressed, intermediate and co-dominant trees (a "thin from below"). Increase the growing space for the largest and most vigorous appearing trees, thereby accelerating their growth and moving the stand towards a late structural stage. The thinned stand would average 40-60 trees / acre depending on the average tree diameter. Overhead canopy closure would be reduced for up to 15 years, but there would still be much overhead cover retained.

Selection Harvest (HSL) – Selectively remove individual trees or groups of trees. Small holes (up to one acre in size) would be created in the tree canopy. A new crop of seedlings would become established in the small openings. This treatment would accelerate the growth of the remaining over-story trees and move the stand more rapidly towards a late structural stage. Canopy closure would be reduced, but normally to a lesser extent than would be the case with a commercial thin.

Shelterwood Harvest (HSH) – Harvest all trees except 20-25 trees per acre. Generally select the largest and most vigorous trees to be retained. The reserved trees would provide a seed source, shelter for existing regeneration, and wildlife habitat. This

prescription is mostly used in dense, stagnant stands. The intent is to establish a new cohort (age class) of trees, capable of growing toward late structural stages. This prescription would create openings in the overhead forest canopy that would persist for several decades.

2. Logging Systems

Ground Based

a) Cut-to-length - Use mechanical harvesters to shear trees, remove their limbs, and cut them to the proper length. Use a self-loading vehicle with a log bunk (forwarder) to load the cut logs and drive them out of the woods to a landing. This method is generally used on slopes less than 35 percent. Harvester / forwarder trails are usually spaced 40 feet apart.

b) Tractor – Cut trees with chainsaws or with tree shearing equipment. Drag trees to a landing site using track-mounted or rubber tire skidders. This method is usually used on slopes less than 35 percent. Yarding (skidding) distances are generally less than ¼ mile. Skid trails are usually 130 feet apart in the harvest unit.

Helicopter – Use a helicopter to fly cut trees to a landing site. Landing sites are usually within 0.5 mile of the unit, but occasionally further away. Trees are usually felled by loggers, as there is no access for tree shearing equipment.

Skyline (cable yarding) – Move cut trees to a landing using a suspended cable attached to a mobile tower parked on a road. This method is generally used on slopes greater than 35 percent. Yarding can be uphill or downhill. Yarding distances are generally 1200 feet or less. Cable corridors are usually 130 feet apart in the harvest unit. Trees are usually cut with chain saws or rarely, with tree-shearing equipment.

3. Non-commercial Treatments

Fuels/Fire - A method to reduce within-stand fuel loadings. Treatments could include mechanical thinning from below and fuel breaks. Fuels/Fire could include harvest of non-commercial material (stewardship). The mechanical treatments are designed to prepare the sites for prescribed fire.

Mechanical Fuels (MF) –Reduce fuel loads and create planting spots for conifer seedlings by piling slash with a grapple piling machine, or masticating small (non-commercial) trees. Mechanical fuel treatments might be done prior to the use of prescribed fire in order to improve the survival of residual overstory trees that are not fire tolerant.

Under-burn (UB) – Use prescribed fire to consume forest litter, the above ground portions of herbaceous vegetation, shrubs and small conifers. Less than 30 percent of the duff should be consumed. There should be <30 percent mortality for trees 8-12” in diameter, and <10 percent mortality for trees over 12” in diameter.

Pre-commercial Thin (PCT) – Thin conifers up to sapling size (5 or 6" in diameter) in existing plantations in order to concentrate growth on the best trees of the desired species mix.

PCT / White Pine Pruning - Thin conifers up to sapling size in existing plantations. Prune western white pine saplings using handsaws or pruning shears up to 4.5 feet off the ground. Pruned trees should have a reduced risk of becoming infected with white pine blister rust.

4. Road Management

New Construction - With Alternative B, approximately 0.4 miles of Forest Road (FR) 2700004 would be re-routed onto an upland area away from Ruby Creek. The existing road segment contains two, very tight switchbacks in the creek canyon, and is a potential source of sediment to the creek. The existing road segment would be ripped and re-vegetated.

Several other new road segments would be built for this project. Public access on these roads and presently closed roads used for this project would be prohibited while the project is active by means of gates / guardrails on the road entrances.

Reconstruction - Road reconstruction would mostly consist of light maintenance of existing, drivable roads.

Rock Pits - A total of four rock pits could be developed. Any new rock source would be located directly adjacent to existing roads. Each pit would likely be developed to a fraction of an acre in size for this project. Over the long term, these pits together would be further developed for future forest management projects and could reach a total maximum size of 13 acres.

Table 8. Proposed road work for the Misery Lake Project.

Roads	Miles
new system road construction	4.8
temporary roads	0.5
existing road reconstruction	20.8

Post-Project Road Management - During the development of this project, the Misery Lake Interdisciplinary Team (IDT) examined the Forest Service road system in the project planning area to see if there were any compelling reasons to re-size the system. The IDT determined that continued access is necessary on:

- roads which access private land and Bonneville Power Administration (BPA) regional transmission power lines,
- roads necessary for operations of the U.S. Air Force Survival School,
- roads necessary for forest and range management, fire protection, and dispersed recreation.

In order to address resource concerns such as erosion, and to reduce road maintenance costs, the IDT identified roads that could be closed with this project including:

- roads in riparian areas, some of which are contributing sediment to streams,
- roads which are not essential for future forest management and contributing to the high road density in the area.

Post-project open and total road densities in the Misery Lake Project Area are displayed in the following table.

Table 9. Post-project roads data by alternative - Misery Lake Project Area

Project Area Route Mileage	**Alternative A (miles)**	**Alternative B (miles)**
open roads (state, county, private)*	24.3	24.4
open roads (Forest Service)	14.8	10.9
motorized trail (user created)	7.1	4.3
total open routes	46.2	39.6
restricted roads	8.0	12.9
impassable routes	10.7	16.4
total routes	64.9	68.9
Project Area Route Density	**Alternative A (mi./sq. mile)**	**Alternative B (mi./sq. mile)**
open roads (state, county, private)	1.1	1.1
open roads (FS)	0.7	0.5
motorized trail	0.3	0.2
total open route density	2.1	1.8
restricted roads	0.4	0.6
impassable routes	0.5	0.7
total route density	3.0	3.1
Deer Winter Range Open Route Mileage	**Alternative A (miles)**	**Alternative B (miles)**
plowed roads	4.0	4.0
other open roads	4.2	4.3
groomed snowmobile trails	0	0
Deer Winter Range Open Route Density	**Alternative A** (mi./sq. mile)	**Alternative B** (mi./sq. mile)
total open roads	1.05	1.06

* Private road mileage would increase with Alt B because a 0.1 mile segment of Forest Road 2700003 would revert to a private road.

5. Wildlife-Related Project Design Criteria - The Forest Service (FS) would incorporate the following elements into the silvicultural and fuels prescriptions, unit layout, tree marking guidelines, and harvest design of Alternative B. We have successfully implemented these practices with similar projects completed on the ranger districts. They have proven to be effective in avoiding or minimizing potential negative effects of the projects to the essential habitats of TES and other wildlife species.

Roadside Hiding Cover - To the extent feasible, enough low vegetation would be retained adjacent to open roads to maintain existing line-of-sight distances from the roads into harvest units. Typically this would entail retaining brush, seedlings, saplings, and pole-sized trees in clumps or linear strips that are at least 20 feet wide. Prescribed fires would not be started within these forested "buffers". If necessary, fuels would be pulled away from the road edge or a fuel break would be cut to minimize the loss of vegetation from the roadside buffer.

Old Forest Stands - Timber harvest would not occur within stands in structural stages 6 or 7 (late and old stand structure). If any stands meeting the North Idaho definition of old growth were identified during future reconnaissance or unit layout, they would be excluded from timber harvest.

Large Live Trees – No trees 21 inches in diameter or larger would be marked for removal, with the exception of those located within new, ground-based or skyline equipment corridors, roads, landings, or rock pits. Old equipment corridors and landings would be re-used to the extent feasible.

Dead Wood Habitats

a) snags - No existing snags would be marked for removal with the exception of those necessary to be felled within new equipment corridors, or for worker safety. Any snags felled for these reasons would be left on site to contribute to down log levels.

b) downed logs – No logs that are 20+" in diameter would be removed. In mixed conifer stands, an average of 15-20 down logs that are 12+" in diameter at the small end and greater than 6 feet long (100-140 feet linear length) would be retained per harvested acre. In lodgepole pine stands, an average of 15-20 down logs that are 8+" in diameter at the small end and greater than 6 feet long (120-160 feet linear length) would be retained per harvested acre (Lowe, 1995).

Within-stand Diversity

a) When thinning dry forest stand types (ponderosa pine / Douglas fir), some overstory leave trees would be left in clumps. An average of 2 - 3 clumps would be retained per harvested acre. A clump would consist of 2 - 6 ponderosa pine or Douglas fir trees that have forks below DBH or are closely spaced (2 - 8 feet apart). This would provide pockets of higher basal area and interlocking tree canopies at the stand level.

b) In shelterwood harvest units that border meadows, clumps of reserved trees would be located on the edges of the meadows to the extent feasible. Shelterwood harvest units on big game winter range would be laid out so that no point in a unit would lie further than 600 feet from forested cover.

c) Where the opportunity exists, patches of shade tolerant regeneration / intermediate sized trees would be maintained within harvest units to provide hiding cover for deer. Where pockets of thermal cover at least three acres in size exist within harvest units, they would be excluded from the units.

d) No hardwood trees would be marked for removal, with the exception of those located within new equipment or road corridors, landings, or rock pits.

Habitat Connectivity – Shelterwood harvest would not occur within mapped travel corridors for old growth associated species. Project activities within mapped travel corridors would maintain;

a) corridor width of 400 feet,
b) overhead canopy closure within the top third of site potential,
c) some understory in patches or scattered to assist in supporting stand density and cover (Lowe, 1995).

Riparian Habitats – Timber harvest or mechanical fuels reduction units would not be located within 50 feet of any wetland less than one acre in size, within 100 feet of wetlands larger than one acre, and within designated Riparian Habitat Conservation Areas (RHCAs) along streams. The fisheries biologist would locate the boundaries of RHCAs.

6. Required Mitigation - The first three measures listed below would be administrative actions necessary under certain conditions to mitigate potential impacts of Alternative B to TES and other wildlife species. Also listed here is a plan for post-project road management, which would be intended to mitigate for new road construction.

TES Species Protection - If a TES species or activity site is found in the project area while the project is active, a biologist would be consulted as to measures required to protect the species / site.

Winter Operations – The wintering period for big game is from December 1 to March 31. If timber harvest occurs during this time, all activities would be confined to units located on one side of the Bonneville Power Administration (BPA) power transmission corridor in a given winter. The other half of the sale area would provide a secure area that ungulates (and wolves) could displace to if they are disturbed by the project. Thus, if winter activities were scheduled to occur west of the BPA corridor in a given winter, no winter activities would occur east of the corridor, and vice-versa. One exception to this would be Unit 44, which would be located east of the BPA corridor but would be logged in the same winter as units west of the corridor.

Raptor Nest Protection – During project implementation, the FS would monitor the known goshawk territory in the Upper North Fork of Ruby Creek. If nesting activity is documented or suspected, no project activities would occur within a mapped, 400 acre post-fledging area (PFA) from March 1 to August 15, in order to avoid disturbing the nesting pair and young. If other raptor or great blue heron nests are discovered in the project area, a biologist would be consulted as to measures required to protect the birds and their nest trees / stands.

Post-Project Road Management

a) Dependent on the amount of wood available in logging slash piles, selected closed roads could be opened to the public for firewood gathering over one season. The FS would sign these roads as open for woodcutting up to a specified closure date.

b) The FS would write closure orders prohibiting all motorized travel on new road segments, with the exception of administrative uses including U.S. Air Force Survival School operations. Following all post-project work, the FS would effectively close selected roads (both new and existing roads) throughout the project area using some combination of ripping, slash piling, installing berms / boulders / plantings on the road entrances, etc.

c) If an existing gate is being driven around by off-highway vehicles, the gate would be moved to a more effective location. An example of an effective gate location is directly in front of a bridge spanning a deeply incised draw.

d) The FS would monitor the effectiveness of road closure each year for five years following the timber sale. If a given closure is not 100% effective at prohibiting unauthorized, motorized travel on the road, the FS would implement actions necessary to improve the closure.

Snags – Following timber harvest, if shelterwood harvest units have less than the prescribed number of snags per acre, the Forest Service would create additional snags by top girdling, inoculation with forest pathogens, or other means. No trees would be treated within commercial thinning and other partial harvest units since only a fraction of the green trees would be logged and any existing snags would be much easier to retain.

7. Potential Habitat Improvement Projects – The following habitat improvement / enhancement projects could be completed in the project area using excess timber sale receipts (KV funds), grants, cost share monies, etc.

Aspen Maintenance / Protection – Small (non-commercial) conifers could be cut down within selected aspen stands to forestall the aspen trees from being shaded out over time. Selected aspen stands on the edges of meadows could be fenced to limit livestock browsing of young sprouts.

Forage Seeding - Shelterwood harvest units that are under-burned could be seeded with the Colville National Forest's preferred seed mixes to supplement green forage for wintering big game.

Meadow Maintenance – Small (non-commercial) conifers could be cut down where they are encroaching into McElroy and Squirrel Meadows, in order to keep these sites in an open, productive condition for big game. Meadows could be burned to remove encroaching conifers and grass thatch, and to rejuvenate grasses.

Orchard Maintenance – Apple trees in an old homestead orchard located on the east edge of McElroy Meadows could be maintained (pruned) to benefit bears and other wildlife.

Riparian Protection / Enhancement – Stream segments exhibiting over-utilization by livestock could be protected with riparian exclosures. Riparian vegetation could be supplemented with plantings grown from local seed sources, or with cuttings from local stock.

Noxious weeds – Following the project, old homestead meadows and other natural openings in the project area could be monitored for new infestations. These could be sprayed with herbicides or hand-pulled.

Pre-commercial thinning - Small (non-commercial) conifers could be selectively thinned in harvest units (ex.; the unit located west of McElroy Meadows) in order to promote the development of future big game cover.

IV. PRE-FIELD AND FIELD REVIEW

We obtained sighting records of TES species in the project planning area and vicinity filed at the offices of the USDI Fish and Wildlife Service, the Colville National Forest Supervisor's Office, and the Newport - Sullivan Lake Ranger Districts. We used aerial photo interpretation, stand exam data, field reconnaissance, interviews, and a geographic information system (computerized mapping) to conduct the analysis for this report.

During field visits we collected data on such things as type and condition of existing big game habitats, occurrence of wildlife or evidence of use, and potential mitigation measures or habitat improvement projects.

V. EFFECTS OF THE PROJECT TO THREATENED AND ENDANGERED SPECIES

A. gray wolf (endangered)

1. Management Framework - The Northern Rocky Mountains Wolf Recovery Plan (USDI 1987) identifies three areas for wolf recovery; the Yellowstone Ecosystem,

northwest Montana, and central Idaho. Currently, there are no plans for wolf recovery in Washington State. Forest Plan direction for wolf management is to investigate sightings and protect any discovered resident animals.

In the Northern Rocky Mountains, wolves prey mainly on deer and elk (Hansen, 1986). Providing quality winter range is a key factor in maintaining healthy herds of big game animals. West of the Pend Oreille River (including the Misery Lake Project Area), the Forest Plan emphasizes managing winter range for deer. The objective for deer winter range in the Forest Plan (page 4-106) is to "Manage for cover / forage ratios approaching 50:50 dispersed to provide for a maximum utilization of forage." At least 20 percent of the cover component should be thermal cover and the rest can be thermal or hiding cover. The Forest Plan defines adequate thermal cover for deer as stands of evergreen trees that are at least 40 feet tall with a crown cover of 60 percent or greater. The distance between cover blocks should not to exceed 600 feet. Hiding cover is defined as vegetation capable of concealing 90 percent of an animal at a distance of 200 feet. Operating seasons for logging and post-sale work should be restricted when necessary to limit disturbance to wintering big game. The management objective for open road density on deer winter range is 1.5 miles per square mile, during the season of use.

2. Existing Conditions - In recent years, biologists have verified sightings of wolves east of the Pend Oreille River in Washington. These animals likely dispersed from Montana or Idaho. There is presently no evidence of a pack of wolves established on the Colville National Forest. A pack is basically a family unit, commonly containing an adult pair (the pack's leaders), this year's pups, and young of past years. The presence of a pack would mean that breeding is occurring and a pack territory has been established.

Prey Animals – Wolf prey animals that might occur within the Misery Lake Project Area include white-tailed deer, mule deer, elk, moose, and small mammals. The project area contains about 4,979 acres of designated deer winter range (Forest Plan Management Areas 6 and 8). Within these areas, a few stands of shade tolerant trees on more sheltered aspects are providing some thermal cover. The majority of the winter range is providing hiding cover for big game. The best foraging habitats are located in riparian shrub / forb fields, old homestead meadows, recent plantations, and underneath the tree canopies of more open forest stands. Very few acres of discrete upland shrub fields exist in the area.

Table 10 displays the existing habitat components on designated big game winter range. Each stand was assigned the habitat component that *best* described the stand using the following criteria:

- Forage – forest stands with available forage in structural stages (SS) 1, 2, or 7, meadows, wetlands, riparian shrubfields (see Table 3 for stand structural stage definitions).

- Thermal cover – stands in SS 3, 4, 5, and 6 with at least 60 percent canopy cover.
- Snow intercept thermal cover - stands in SS 6 with at least 70 percent canopy cover.
- Hiding cover – typically stands in SS 3, 4, 5.

Note that on the Newport-Sullivan Lake Ranger Districts, stands typed as thermal or snow intercept thermal cover are also providing hiding cover as a rule. This may also be the case for some stands typed as forage.

Table 10. Existing acres of habitat components on big game winter range (Management Areas 6 and 8) in the Misery Lake Project Area.

Winter Range Habitat Component	Existing Acres (percent)	Forest Plan Goal Acres (percent)
Forage	1,198 (24%)	2,490 (50%)
Thermal Cover	187 (4%)	996 (20%)
Snow inter. cover	0	
Hiding cover	3,566 (72%)	1,494 (30%)
Other (e.g., rock)	28 (<1%)	NA
Total Winter Range	4,979 (100%)	4,979 (100%)

As displayed in Table 10, designated winter range in the project area is low in forage (24 percent) and exceeds cover goals (76 percent). Only about 187 acres (4 percent) of the designated winter range is providing thermal cover. An additional 157 acres of thermal cover exist in a designated MA1 area (old growth associated species habitat). This MA1 area is surrounded by designated winter range and is also providing wintering habitat for ungulates.

Recent research conducted in the Blue Mountains of Oregon and Washington has shown that there is "little justification for retaining thermal cover as a primary component of habitat evaluation models for elk" (Cook, et al, 2004). These authors stated that elk likely derive potential benefits from forest cover such as "enhanced security, reduced snow depth, and perhaps under some conditions, a better foraging environment." However, the thermo-regulatory properties of dense tree canopies have much less importance to elk than was originally thought. The provision of quality forage, hiding cover, and seclusion from human disturbances are now thought to be much more important management objectives. Deer are able to use cover down to about three acres in size. Dense pockets in some stands typed as hiding cover in the table above might also provide thermal cover for deer. Such inclusions are difficult to accurately map.

Den and Rendezvous Sites – Wolf dens in the Northern Rocky Mountains are commonly excavated in well-drained soils, on southerly aspects, and on moderately steep slopes. The sites are usually within 0.25 mile of surface water and overlooking

surrounding low-lying areas. There are a number of apparently suitable areas for den excavation in the project area. There are no known caves that could be used for denning. There are some rock outcrops, but no suitable den sites have been identified in those sites. Literature from the 1970s and 1980s indicated that wolf packs were sensitive to human disturbance near den sites and may abandon the den as a result of disturbance. Recent information suggests that wolves have become more adapted to human activities.

Rendezvous sites usually consist of complexes of meadows and adjacent hillside timber, with surface water nearby (streams, bogs, old beaver ponds). The size of these areas may vary, but most are about one acre. Wolves will move the location of rendezvous sites during the summer as their pups grow. Much of the riparian shrub field habitat along the major streams in the project area could provide suitable rendezvous habitat, as could several scattered wetlands.

Seclusion - Wolves could use all habitats on the Colville National Forest that provide an adequate prey base. However, they may be limited by the amount of use an area receives by humans. To provide adequate seclusion habitat for wolves, Hansen (1986) recommended that open road densities not exceed one mile per square mile on National Forests in northern Idaho and northeast Washington. A wolf using an area of high road density is more prone to being struck by a vehicle, shot by a legal hunter mistaking it for a game animal (coyote), or simply poached.

The open motorized route density in the project area is 2.1 miles per square mile. On National Forest System (NFS) lands only, the open route density is 1.0 mile per square mile.

During the winter months, no roads are groomed for snowmobiles in the project area. State and county owned road segments are plowed in the winter. Every few years, Forest Road 2700004 is plowed by the US Air Force to facilitate winter survival training operations. A few other FS road segments are open, but not plowed. We have never documented snowmobile use on these roads in the winter. The open road density on designated winter range is 1.05 miles per square mile.

3. Effects of This Project

Effects to Big Game Cover and Forage

Alternative A – This alternative would likely have no immediate effect on big game habitats since no forest management would occur. Over time, certain younger stands of trees would mature and begin to attain the necessary height and crown closure of thermal cover. Other stands that are too over-stocked with trees are likely to stagnate and never develop enough overhead canopy to provide thermal regulatory properties for big game.

Forage plants in plantations and more open forest stands would slowly decline in productivity as growing conifers begin to out-compete with them for sunlight, water and soil nutrients. Designated winter ranges in the project area would accumulate

more cover, while forage values would decline. This trend could be reversed by a large-scale wildfire. Ground and ladder fuels would continue to increase incrementally in forest stands across the project area. The potential for a large, intense wildfire to remove whole stands of conifers would increase over the long run. In the case of such an event, the resultant increase in sunlight on the forest floor would promote the growth of upland shrubs, grasses, and forbs; thereby providing new forage for big game. However, high-intensity fires have the potential to burn large expanses of forest and result in very large openings. Forest edge associated species such as big game may under-utilize the interiors of such large openings, owing to the absence of nearby cover.

Stand replacement wildfires are the most likely to provide good growing conditions for noxious weeds. With high intensity fires there would be more overhead canopy removed (higher light levels), more duff consumed (exposing soils), and less living vegetation for newly established weeds to compete with for sunlight, water, and soil nutrients. In areas of heavy weed infestation, existing native plants could be replaced, including those palatable to big game animals. Large infestations could change the way the animals use the landscape by effectively reducing the area of suitable forage habitat.

Alternative B – Timber harvest, mechanical fuels treatments, and low-intensity, prescribed fires proposed with this alternative would reduce ground fuels and continuous fuel ladders. Future wildfires that occur in treated stands should burn cooler and would be less likely to ascend into the crowns of over-story trees. Thus, the risk of a hot crown fire removing forest cover over large areas would be reduced in the project area.

Where low-intensity, prescribed fire is employed, decadent vegetation on upland shrubs and grasses would be removed. A "pulse" of nutrients would be released into the soil. Forage plants for big game should respond to these burns with robust basal sprouting and an increase in palatability for several years following treatment.

Noxious weeds could potentially colonize soils exposed by logging equipment and prescribed fire. However, a number of factors would work to minimize the potential for noxious weeds to spread within the project area. Prescribed fires would be completed during optimum weather and fuel moisture conditions in order to ensure low-intensity fire behavior. Thus, most of the forest duff should be maintained in burned areas and very little soil should be exposed. New roads constructed with the project would be closed to the public. These actions would reduce the potential for noxious weeds to spread along new road corridors. The project would incorporate routine mitigation to check the spread of noxious weeds such as seeding exposed soils at landings, skid trails and burn piles. Prior to the project, a FS contractor would use herbicides to treat weed infestations on roads in the project area.

Commercial timber harvest would remove or degrade forest cover where it exists. Regeneration harvest (shelterwood) would convert hiding cover to open forage habitat

for 15 or more years. Existing browse and green forage plants in these units should become markedly more palatable and productive; particularly where post-harvest broadcast burning occurs. Regeneration harvest would create additional forest edge habitat. Alternative B would move the cover / forage ratio on deer winter range closer to the desired 50 / 50. If necessary, hiding cover blocks of three or more acres would be retained within the larger created openings to ensure that the distance to cover does not exceed 600 feet.

Where intermediate harvest prescriptions (commercial thinning, selection) are used, hiding cover would be locally degraded for five years or more, and essentially removed for at least that long within new skid trails. Based on intermediate harvests completed elsewhere on the ranger districts, there should be enough understory vegetation retained to provide hiding cover at the stand level.

Thinning and selection harvests would target suppressed, intermediate, and co-dominant trees and retain the most vigorous and full crowned trees (including all large trees). There would be less inter-tree competition for light, water, and soil nutrients in the residual stand. Over time, these treatments should promote the rapid development of larger, full crowned trees sooner than had no treatment occurred. High quality thermal cover could be developed in these stands over the long run.

Stands typed as thermal cover would not be harvested. Where pockets / inclusions of thermal cover at least three acres in size exist within stands proposed for harvest, they would be excluded from harvest.

The table below displays the changes in winter range habitat composition that would result from timber harvest in the project area.

Table 11. Acres of habitat components on designated deer winter range (MAs 6 and 8) by alternative.

Winter Range Habitat component	Alternative A Acres (percent)	Alternative B Acres (percent)
Forage	1,198 (24%)	1,841 (37%)
Thermal cover	187 (4%)	187 (4%)
Snow inter. cover	0	0
Hiding cover	3566 (72%)	2923 (59%)
Other	28 (<1%)	28 (<1%)
Total winter range	4,979 (100%)	4,979 (100%)

Effects to Seclusion

Alternative A – The level of human disturbance in the project area would remain unchanged from the present condition. Road densities would be unchanged.

Alternative B - The level of human disturbance in the project area would increase for the duration of the project. Wolves are likely to avoid areas of ongoing timber harvest (particularly helicopter logging), road construction, or prescribed burning activities.

Some of the commercial timber harvest proposed with these alternatives would occur during the winter in order to protect sensitive soil types. To limit disturbance to wintering big game, winter harvest activities would be confined to units located in one half of the sale area in a given winter. Any elk or moose wintering in an area of harvest activity should be able to displace to other lands in the surrounding area where no activities would be ongoing. Deer feed on lichens and conifer needles made available by winter harvest operations on the ranger districts. We have sometimes observed deer foraging in harvest units while logging is occurring.

The total road mileage in the Misery Lake Project Area would be increased with this project. Gates would be installed on new road segments if they are not already gated. New roads would be closed to the public while the project is active. Once the timber sale is complete, personal woodcutting from logging slash piles could be allowed on a given road system for one season. Following all post-sale work such as tree planting, the Forest Service would install several large earthen berms on certain closed road entrances. These road entrances would be obscured with planted shrubs and trees, seeded grasses and forbs, piled slash, etc. Several existing open or restricted roads in the project area would be treated in a similar manner. Road closure orders would be written to prohibit all motorized vehicle use of closed roads. Once all road closure work is complete, the open motorized route density in the planning area would decrease from 2.1 miles per square mile (present condition) to 1.8 miles per square mile. On NFS lands only, the open motorized route density would decrease from 1.0 to 0.7 miles per square mile.

Effects to Den and Rendezvous Sites
Alternative A - The suitability of the project area as potential wolf denning or rendezvous habitat would be maintained with this alternative since no forest management would occur.

Alternative B – In the unlikely event an active den or rendezvous site is established in the project area, project activities might cause the breeding pair to move pups to a more secluded location. The timber sale contract would provide the means to protect any individual wolf, den site, or rendezvous site found during the life of the sale.

Cumulative Effects - Known wolf pack territories have ranged from 20 square miles in size in Minnesota to at least 685 square miles in Alberta (USDI, 1987). Thus, a cumulative effects analysis could be made at the level of Pend Oreille County, which includes all of the Newport-Sullivan Lake Ranger Districts.

Cumulative Effects to Wolf Prey – Since 1988, forest management projects on the ranger districts have adhered to Forest Plan standards and guidelines for ungulate winter ranges. The Misery Lake project would contribute to the long term objective of

providing optimum levels / distribution of forage and cover habitat on NFS lands. The project would compliment big game habitat improvements the Forest Service has completed and proposes to complete such as prescribed burning of upland shrub fields, noxious weed eradication in meadows, aspen protection and restoration, and road closures. Big game predators such as wolves could indirectly benefit from these projects.

The Misery Lake project could contribute to the spread of noxious weeds in the county. To minimize this potential, the Forest Service would spray herbicides on roadside weeds prior to the project, seed soils exposed by equipment operation, close new and existing roads, etc. These actions are standard procedure for vegetation management projects on the ranger districts. Active weed spraying programs will be necessary so long as forest management, grazing, and forest recreation continues.

Winter ranges on most private lands are not likely to be managed with the needs of wintering big game in mind. The provision of a mosaic of cover and forage blocks are unlikely to be a consideration. Winter range areas on private lands would continue to be converted to agriculture and residential uses. Noxious weeds are likely to increase on private lands over time, due to an apparent low level of commitment to prevention, treatment, and monitoring.

Cumulative Effects to Seclusion – Human settlement and past road construction in the county reduced seclusion habitat for wildlife; particularly on private lands in the Pend Oreille River Valley. Since the Forest Plan went into effect in 1988, new roads built on NFS lands have been closed, unless there was a compelling resource reason to keep them open. This would be the case with the Misery Lake project. However, the Misery Lake project would contribute to an increase in total road densities (open and closed roads) in the local area, potentially leading to increased, illegal access by off-highway vehicles (OHVs). In order to minimize this potential, the Forest Service would obliterate the entrances of certain roads as described earlier. In addition, the Forest Service would analyze the entire road system in each new project area, and evaluate the need to obliterate the entrances of existing open or restricted roads. New roads built on private lands are sometimes gated or signed as closed to public use. They appear to be seldomly obliterated on private lands.

Cumulative Effects to Den and Rendezvous Sites – The presence of an active wolf territory on the Colville National Forest would not be difficult to detect. In the event an active den or rendezvous site is discovered, the Forest Service would take steps to protect the site from human disturbance, if necessary. All timber sale contracts would provide the means to protect any individual wolf, den site, or rendezvous site found during the life of each project.

5. Effects Determination – The project area lies outside of designated recovery habitat for wolves. This means that habitats in the area are not needed for the survival and recovery of the species. During the life of the project, individual wolves, den sites, or rendezvous sites discovered in the area would be protected according to

direction in existing recovery plans and with standard timber sale contract clause CT6.25.

Alternative A would maintain existing habitats for wolves and their prey over the short-term. Forage opportunities for big game animals would slowly decline as young trees grow within existing plantations. The risk of high-intensity fires in the area would increase incrementally over time. Such fires could remove forest cover over large areas and dramatically increase browse and green forage production for big game. The interiors of large burns may be under-utilized.

Timber harvest and prescribed burning proposed with Alternative B would improve the forage component of big game winter ranges in the short term. Alternative B would move the project area towards a more historic fire regime; one where big game forage would be maintained at more stable levels over time. However, this alternative would increase total road densities in the area, potentially increasing the risk of wolf mortality. This risk would be greatly reduced by the proposed road entrance obliteration work, and minimized over time as the roads become brushed in. Based on this discussion, the alternatives as proposed may affect, but are not likely to adversely affect gray wolves.

Risk Analysis – All Alternatives
Likelihood of adverse effects = moderate
Consequence of adverse effects = low
Risk index value = 5 x 1 = 5

B. grizzly bear (threatened)

1. Management Framework – The Interagency Grizzly Bear Guidelines (IGBC, 1986), the Grizzly Bear Recovery Plan (USDI, 1993) and the Forest Plan all provide direction for managing habitat for grizzly bears. The Grizzly Bear Recovery Plan identifies specific recovery areas in the western United.States. On the Colville National Forest, a portion of the Selkirk Mountains Grizzly Bear Recovery Area is located east of the Pend Oreille River and north of the Middle Creek drainage. Grizzly habitat maintenance and improvement, and grizzly-human conflict minimization are the highest management priorities for public lands within recovery areas.

The Misery Lake Project Area lies outside of recovery habitat and within lands classed as Management Situation 5 for grizzly bears. Grizzlies rarely occur in these areas although they contain some suitable and available habitats. These lands are considered unoccupied. Grizzly habitat needs are not a necessary consideration, but maintenance and improvement of habitats is an option (IGBC, 1986).

2. Existing Conditions - Grizzly bears might pass through the project planning area on rare occasion. Within the past 15 years, individual bears have been seen south, east and west of the project area.

Forage - Diets of grizzly bears change with the seasons as different food sources become available. Palatable grasses, sedges, and herbs provide important spring forage for grizzly bears. Within the project area, these resources can be found in riparian shrub / forb fields along Ruby Creek and other major streams, in several small wetlands, and meadows. Shrub fields that provide berry crops are important late summer / fall foraging sites for bears. The planning area contains modest amounts of buffaloeberry, huckleberries and other berry producing shrubs under the tree canopies of many forest stands. There are very few acres of discrete berry-producing shrub fields in the area. Rotting tree stumps and large down logs that provide bears with ants and other insects are uncommon to rare in the project area. Occasional winter killed deer or elk might be available in early spring.

Den Sites – Dens are typically "dug by bears, or occur in natural cavities in subalpine, montane, and rock community groups" (USDA et al, 2000). Timbered habitats at mid-elevations (down to perhaps 4,000 feet) could also be used for denning. The project area lies at lower elevations and does not contain any habitats that appear particularly suited for grizzly denning.

Hiding Cover - Hiding cover for grizzly bears is defined as vegetation capable of hiding 90 percent of a bear at a distance of 200 feet (USDA Forest Service, et al, 1990). This habitat component is most important along open roads. There is no established guideline for providing hiding cover for grizzlies outside of recovery areas.

Seclusion Habitat – Seclusion habitat for grizzly bears is defined as areas lying beyond a 0.25 mile "zone of influence" around open roads and campgrounds, and 0.1 miles around high-use trails. Within these zones of influence, grizzly bears are most prone to being disturbed and displaced from suitable habitat by encounters with vehicle traffic and people on foot. The risk of a bear being shot by a poacher, or mistaken for a black bear and shot by a legal hunter, is higher in these areas. There is no guideline for providing seclusion habitat for grizzly bears outside of recovery areas.

3. Effects of This Project

Effects to Forage

Alternative A - Within the planning area, existing berry-producing shrubs would continue to provide modest fall foraging opportunities, so long as enough sunlight reaches them under the forest canopy. Spring forage would continue to be available for many years to come within discrete wetlands, in the alder/willow shrub fields associated with major creeks, and in young plantations. By the time trees growing in plantations are 15-20 years old, spring forage plants would be growing in partial sun or full shade, and much less productive or shaded out.

Ground and ladder fuels would continue to accumulate in the project area over time. The potential for a large, hot wildfire to remove entire forest stands would increase correspondingly. In such an event, there would be a dramatic increase in sunlight reaching the forest floor. Upland shrubs, grasses, and forbs whose root systems have not been totally scorched, should quickly re-sprout and benefit from the increase in available sunlight. Over a few years these plants could provide significant new foraging opportunities for bears.

Burns of high intensity are the most likely to provide good growing conditions for noxious weeds. With high intensity burns there would be more overhead canopy removed (higher light levels), more duff consumed (exposing soils), and less living vegetation for newly established weeds to compete with for sunlight, water, and nutrients. In areas of heavy weed infestation, existing native plants could be replaced, including those that are palatable to bears. Large infestations could change the way that bears use the landscape by reducing the area of suitable habitat.

Alternative B - Timber harvest proposed with this alternative would reduce the overhead tree canopy in many stands that are typically densely stocked with immature trees. Buffaloeberry and other shrub species growing on these sites could benefit from the increase in available sunlight. Harvest prescriptions that create openings (such as shelterwood harvest) have the greatest potential to benefit berry-producing shrubs.

Alternative B would employ low-intensity burns to reduce forest fuel loads. Treated areas would be a mosaic of burned and un-burned sites, relative to the amount of surface fuels present. Prescribed fires would thin out dense areas of conifer regeneration and consume litter and down wood on the forest floor. A “pulse” of nutrients would be released into the soil. As a result, green forage should become more palatable and productive for a few years following burning. It would take a number of years for burned, berry-producing shrubs to re-sprout and grow fruit again. Over the long run, berry production could be enhanced in burned areas.

Timber harvest and prescribed fire could expose soils and provide opportunities for the expansion of noxious weeds. New roads could provide pathways for the spread of noxious weed seeds. If weeds become locally established due to this project, they could out-compete existing bear forage plants (particularly native grasses and forbs). This risk would be greatest along new road and equipment corridors, and where there is a nearby seed source.

A number of factors would work to greatly minimize the potential for noxious weeds to spread within the project area. Prescribed burns would be completed during optimum weather and fuel moisture conditions in order to ensure low-intensity fire behavior. Thus, most of the forest duff should be maintained in burned areas and very little soil should be exposed. New roads would be closed to the public. Once the project is complete, certain restricted roads would be more effectively closed with berms / boulders, and plantings. The project would incorporate routine weed control measures such as seeding exposed soils at log landings, skid trails and burn piles.

Herbicides would be sprayed on roadside noxious weed infestations prior to the start of the project. In addition, the ranger districts would continue to use herbicides to combat weed infestations in meadows, power line corridors, and other openings.

Effects to Hiding Cover
Alternative A – Hiding cover would be maintained at existing levels over the short term, and slowly increase in extent and quality throughout the project area as young confers continue to grow. Fuel loading and ladder fuels would continue to build up in the project area over time. The potential for a large, intense fire to remove conifer cover would continue to increase over the long run. In such an event, hiding cover would be removed in areas of high intensity burns and degraded in mixed or low severity burn areas. Bears moving through a large burned area could be vulnerable to human-caused disturbance or mortality, particularly near open roads.

Alternative B – As a rule, low-intensity prescribed burns would have minor and short-lived (1-5 years) impacts to hiding cover. Owing to discontinuous fuels at the stand level, there would be many areas of unburned, "fire skips". Even in areas that are well blackened, some degree of horizontal cover would be provided by the skeletons of shrubs and young trees, partially burned logs, and live and dead tree boles. Upland shrubs, grasses, and forbs would quickly re-sprout from the roots and regain much of their above-ground biomass in one or two growing seasons.

All forest cover would be removed within new rock pits and new road corridors for the long term. Hiding cover would be degraded (but not removed) within areas proposed for thinning or selection harvest for five or more years. After that time, stand understories should have grown to the point where good horizontal cover is restored. Within equipment corridors and areas proposed for shelterwood harvest, hiding cover would be degraded or removed for perhaps 10 - 20 years. Pre-commercial thinning would have negligible impacts to hiding cover. To minimize project impacts to hiding cover, vegetative strips would be maintained along open roads adjacent to treatment units where feasible. Where they have been used on the ranger districts, these roadside "buffer strips" have been very effective in maintaining sight distances from open roads.

Effects to Seclusion Habitat – The level of human disturbance in the project area would increase for the duration of the project. Bears are likely to avoid areas of ongoing timber harvest (particularly helicopter logging), road construction, or prescribed burning activities.

New roads would be closed to the public while the project is active. Once the timber sale is complete, personal woodcutting from logging slash piles could be allowed on a given road system for one season. Following all post-sale work such as tree planting, the FS would install several large earthen berms on certain closed road entrances. These road entrances would be obscured with plantings, forage seeding, piled slash, etc. Several existing open or restricted roads in the project area would be treated in a similar manner. Road closure orders would be written to prohibit all motorized

vehicle use of closed roads. Once all road closure work is complete, the area of seclusion habitat should be increased.

Cumulative Effects - In designated grizzly bear recovery areas, biologists evaluate and monitor habitat for bears over grizzly bear management units (BMUs). A BMU is very roughly 100 square miles in size; the average land base required by an adult sow with cubs. The Misery Lake Project Area is roughly 22 square miles in size. A logical unit of land to use for a cumulative effects analysis is the Ruby Creek and Lost Creek watersheds. This area is roughly 120 square miles in size. This area includes the Misery Lake project, and the ongoing Brown's Lake Timber Sale and Fuels Reduction Project.

Cumulative Effects to Hiding Cover – The Misery Lake project would contribute to reductions in hiding cover quality in the watersheds resulting from other forest management projects. However, hiding cover would be removed only within new road prisms, rock pits, and within recently logged regeneration harvest units. These effects would be minimized with the retention of no-cut strips in harvest units located along open roads (as described earlier). No project on National Forest System (NFS) lands would create large openings devoid of cover that bears might be reluctant to cross. It should also be noted that additional acres of hiding cover are being recruited in older plantations on all ownerships with each passing year. The landscape on public land should remain highly permeable to dispersing bears over time. Many forest stands on private lands are likely to be converted over time to other uses such as agriculture and residential; eliminating this habitat component.

Cumulative Effects to Forage - The Misery Lake project would contribute to improvements in forage for bears resulting from forest management projects that remove conifer cover. These benefits are likely to be greatest in areas of shelterwood harvest that are subsequently broadcast burned. However, even partial harvests (thinning, selection prescriptions) can improve growing conditions for existing green forage and berry-producing shrubs.

The Misery Lake project could contribute to the spread of noxious weeds in the watersheds where soil has been exposed by prescribed burning, equipment operation, or road construction. To minimize this potential, the Forest Service would continue to seed exposed soils, close new and existing roads, spray infested meadows and road shoulders with herbicides, etc. These actions have been very effective in many areas of the ranger districts. Active weed spraying programs will be necessary so long as forest management, grazing, and forest recreation continues. Noxious weeds are likely to increase on private lands over time, due to an apparent low level of commitment to prevention, treatment, and monitoring.

Cumulative Effects to Seclusion – These would be identical to those reported earlier for gray wolves.

5. Effects Determination - Although grizzly bears could occur in the Misery Lake Project Area on occasion, the area lies outside of designated recovery habitat. This means that habitats in the area are not needed for the survival and recovery of the species. There is no direction to manage habitats specifically for grizzlies in the area. During the life of the project, individual bears discovered in the area would be protected according to direction in existing management / recovery plans, and by standard timber sale contract clause CT6.25.

Alternative A would maintain habitats for grizzlies over at least the short-term. This alternative would not address the increasing risk of a high-intensity fire removing large areas of hiding cover. Alternative B would reduce the risk of future, intense fires in the project area, and improve forage resources for bears. However, this alternative would also increase total road densities in the area. The risk of a bear being disturbed and displaced from suitable habitat near a road, or shot from a road, could increase. This risk would be greatly reduced or avoided with the proposed road entrance obliteration work. Based on this discussion, the alternatives as proposed may affect, but are not likely to adversely affect grizzly bears.

Risk Analysis – All Alternatives
Likelihood of adverse effects = moderate
Consequence of adverse effects = low
Risk index value = 5 x 1 = 5

C. Canada lynx (threatened)

1. Management Framework - This animal was listed as a threatened species in March of 2000. An interagency team completed the Canada Lynx Conservation Assessment and Strategy (Ruediger, et al, 2000) several months later. That document is a culmination of the latest research findings on lynx, and proposes guidelines, objectives, and standards, for all projects on public lands within designated lynx range.

In 2000, biologists with the Colville National Forest mapped Lynx Analysis Units (LAUs), based on watershed boundaries. This was a task identified in the Canada Lynx Conservation Assessment and Strategy (LCAS). On the west side of the Pend Oreille River, the lower limit of lynx primary range roughly coincides with the 4,000 foot contour. The Misery Lake Project Area lies below 4,000 feet in elevation and is outside of lynx primary range.

2. Existing Conditions - In northeastern Washington, lynx use lodgepole pine, subalpine fir, Englemann spruce, and aspen cover types in subalpine fir plant associations. Cedar/hemlock cover types may also be important to lynx in this part of the state. Subalpine fir plant associations are rare to non-existent in the Misery Lake Project Area. Cedar/hemlock cover types are common, as are stands with a major lodgepole pine component. No lynx observations are on record at the ranger districts

from the project planning area. There are no known lynx den sites within the vicinity of the project area or anywhere in the nearby Ruby LAU.

3. Effects of This Project - Areas outside of LAUs are not considered important for supporting reproducing lynx (LCAS 7-2 to 7-4). Project activities would not occur within the vicinity of any known lynx den site. Thus, the project would not affect adults or kittens during critical life stages. There would be no direct, indirect, or cumulative effects resulting from this project.

4. Effects Determination –Based on the preceding discussion, the alternatives as proposed would be consistent with management direction in the LCAS and would have no affect on lynx.

Risk Analysis – All Alternatives
Likelihood of adverse effects = none
Consequence of adverse effects = low
Risk index value = 1 x 0 = 0

VI. EFFECTS OF THE PROJECT TO SENSITIVE SPECIES

A. bald eagle (FS sensitive)

1. Management Framework – The Bald and Golden Eagle Protection Act (Eagle Act) and the Migratory Bird Treaty Act protect bald eagles from a variety of harmful actions and impacts. On August 8, 2007, the USDI Fish and Wildlife Service (FWS) removed bald eagles from the threatened and endangered species list. Upon de-listing, the FWS developed the National Bald Eagle Management Guidelines "to advise landowners, land managers, and others who share public and private lands with bald eagles when and under what circumstances the protective provisions of the Eagle Act may apply to their activities" (USDI, 2007). The Forest Plan (page 4-41) states that active and potential bald eagle nesting habitat will be inventoried. In addition, the cumulative effects of forest management on nest sites must be evaluated to insure the continued suitability of existing and potential sites.

2. Existing Conditions
Essential Habitats **-** The most important component of habitat used by eagles is a foraging area that provides adequate food with a minimum of disturbance from humans (Stalmaster, 1987). Foraging areas are typically along rivers or on lakes and marshes larger than 40 acres. Fish and carrion are the primary foods of this bird. The Pend Oreille River is the most significant source of fish in the county. Misery Lake does not contain fish. Creeks in the project area are not large enough to be used for foraging by eagles, with the possible exception of some of the beaver ponds on Ruby Creek. Eagles have never been documented using water bodies in the planning area other than the river.

Nest, perch, and roost trees selected by eagles are commonly among the largest in the stand, often towering above the main forest canopy (Stalmaster, 1987). Roost sites are often located in areas that have protected microclimates, such as on a slope that is sheltered from the wind. Nest and perch trees are typically located within close proximity of a foraging area.

The nearest known active bald eagle nest is on the Pend Oreille River at the northeastern edge of the planning area. This nest is located in a stand of black cottonwood trees on private land. The great majority of eagle nests in the county are located in large cottonwoods growing in close proximity to the river. Because most of the river corridor is privately owned, the best potential nesting and perching habitat in the Misery Lake project planning area is located on private land.

Bald eagles often use old growth forest stands as winter roost sites. The tall, spreading tree canopies of these stands can provide the birds with insulating cover during very cold weather. In the project planning area, there are no stands that appear suitable as roost sites. No evidence of an active winter roost has been discovered in the area.

Seclusion – Eagles can be sensitive to human disturbance during the breeding season and at foraging or sheltering sites. Disturbance at the nest can lead to nest abandonment, or cause adults to leave eggs or young unattended long enough to make them vulnerable to the elements (USDI, 2007). Human disturbances at foraging areas can interfere with feeding and can also result in reduced productivity (number of young successfully fledged).

3. Effects of This Project

Effects to Essential Habitats

Alternative A – No forest management would be initiated in the project area. Over long periods of time, more large trees that bald eagles require for nesting and perching could be recruited in those stands where trees have ample growing space. Dense, stagnated stands of small diameter trees are unlikely to ever produce significant numbers of large trees. In many stands, dense understories of shade tolerant trees would continue to grow into the canopies of dominant PP, WL, and DF trees. Because of these fuel ladders, the risk of a fire ascending into the crowns of mature trees would continue to increase. Over time, mature lodgepole pine (LP) trees would become more susceptible to insect and disease attack across the project area. Large die-offs of LP would lead to heavy concentrations of fuels as they fall to the ground, increasing the risk of stand replacing fires. A hot fire resulting from these processes could remove potential large tree habitat over large areas.

Alternative B – No timber harvest would occur within any old growth stands (none exist in the area), or designated habitat areas for old growth associated species. No cottonwood trees growing along the Pend Oreille River corridor would be impacted. Commercial thinning and selection harvest would occur within one mile of the river. These harvest prescriptions would target smaller diameter, intermediate and co-dominant trees (a “thin from below”). The vigor and growth of the residual trees in

these stands should be improved, potentially accelerating their growth. Shelterwood harvest would occur over roughly 80 acres of stands within one mile of the river. Even-aged trees of smaller diameter would be targeted for removal within these areas. The only large trees (21 inches in diameter or larger) that would be harvested anywhere in the project area would be those few that might exist within new equipment or road corridors (personal comm. with J. Powell). It is standard practice for the Forest Service to utilize old equipment corridors to the extent possible. Thus, the proposed timber harvest should have insignificant or discountable effects to potential bald eagle habitats.

Prescribed fire would be used as a tool to reduce fuel loads and work towards restoring the historic fire regime in the area. Brush, smaller fuels, and dense clumps of conifers would be targeted for removal with these under-burns. Treated areas would be a mosaic of burned and un-burned sites. Up to 50 percent of the total area proposed for burning would likely be blackened. Some trees (particularly thin-barked species such as grand fir) could be killed immediately or become stressed from scorching and die at a later date. This might occur to individual trees or dense clumps of trees and should not be widespread in the treated areas. In burned areas, there should be less than 30 percent mortality for trees 8-12 inches in diameter, and less than 10 percent mortality for trees over 12 inches in diameter (low percentages would be expected). Large diameter, thick barked trees are the most likely to survive these low-intensity fires. These trees are the ones normally selected by eagles for nesting. Overall impacts to potential bald eagle habitats from prescribed fires should be insignificant or discountable.

Effects to Seclusion
Alternative A – The level of human disturbance in the project area would remain unchanged.

Alternative B - No project activities would occur within two miles of the active nest stand at the mouth of Lost Creek. Nesting activities at this site would not be disrupted by this project. No project activities would occur between State Highway 20 and the river, where eagles perch and roost in cottonwoods and conifers growing in the river corridor.

Cumulative Effects – The Pend Oreille River in Washington supports a number of bald eagle nesting territories, and has been used to assess the recovery of the species in this part of the state. Thus, a reasonable cumulative effects analysis area is Pend Oreille County, which includes the river and all of the Newport-Sullivan Lake Ranger Districts.

Most National Forest System (NFS) lands in the county lie at least a mile from the Pend Oreille River. Since 1994, management direction for the Colville National Forest has been to maintain all trees that are 21 inches in diameter or larger, within harvest units (Lowe, 1994, 1995). With any project proposed or underway on NFS lands, large trees would be protected, with the exception of those few that might be cut

down within new equipment or road corridors. Equipment corridors are marked to avoid bigger trees to the extent possible. Very few large trees should be killed in areas proposed for under-burning on NFS lands. This is particularly true of thick-barked species such as Douglas fir, ponderosa pine, and western larch. Black cottonwoods, which are the preferred bald eagle nest tree in the county, would not be marked for harvest on NFS lands. With any forest management activities, the Forest Service would follow the National Bald Eagle Management Guidelines (USDI, 2007) for managing essential habitats, and limiting disturbance to eagles.

Lands in the Pend Oreille River Valley provide the best quality eagle habitats in the county. Many large trees have been removed from private ownerships in the river valley. This trend is likely to continue. However, active nest territories on private lands receive site-specific protection, as determined by state biologists. Even with increasing development of land along the river, the number of active bald eagle nests in the county has steadily increased in recent years. In 2006 alone, a total of seven new nests were documented on private lands along the river (personal comm. with S. Zender). Active nest territories will reach a saturation point, and potentially decline with further conversion of land to residential uses. Conservation lands in the river corridor including those managed by the Forest Service, USDI Fish and Wildlife Service, the Kalispel Tribe of Indians, and the Pend Oreille County Public Utility District, are the most likely to provide secure nesting habitat over the long term.

4. Effects Determination – Alternative A would maintain all habitats over the short term, but would not address the increasing risk of a high-intensity fire removing large tree habitat over substantial areas. Alternative B could remove some large trees within new road and equipment corridors, and areas that are under-burned. The likelihood of adverse effects would be low since relatively few large trees are likely to be lost, and the project would not affect the best quality habitat along the Pend Oreille River. Thus, the alternatives as proposed may impact individual eagles, but would not lead to a trend towards federal listing or a loss of viability of the species.

B. wolverine (FS sensitive)

1. Management Framework - The Forest Plan provides no specific management direction for wolverines. Suitable habitat is probably "best defined in terms of adequate food supplies in large, sparsely inhabited wilderness areas" (Kelsall, in USDA, 1994). Forest Plan management direction for wilderness and semi-primitive non-motorized areas could potentially benefit wolverines. The provision of seclusion habitat for grizzly bears and for wintering big game animals could also benefit wolverines.

2. Existing Conditions – A few documented sightings of wolverines exist from the Newport-Sullivan Lake Ranger Districts, mainly from steep, high elevation habitats like the Salmo-Priest Wilderness. Reports of potential wolverine sightings have come from west of the Misery Lake planning area.

Wolverines are extremely rare in northeast Washington, but they may find suitable habitat throughout the Colville National Forest. Wolverines frequent boreal woodlands but may use almost any habitat type. Krantz, et al, (1991) cited studies in Montana where wolverines frequently used subalpine fir, lodgepole pine, and western larch stands. Large areas of medium or scattered mature timber and ecotonal areas associated with cliffs, rock slides, swamps, and meadows were particularly important. Travel was generally along timbered ridges and creek bottoms. The Misery Lake Project Area contains a few acres of surface rock features such as talus slopes or outcrops, and there are a number of forested wetlands and wet meadows. High elevation habitats do not exist in the area.

Den Habitat – Wolverines construct their dens in various sites including the cavities of hollow trees and logs, under the roots of upturned trees, or among boulders and rock ledges (Ruggerio et al, 1994). Females appear to prefer high-elevation, north-facing talus slopes, for natal denning (Heinmeyer et al, 2001). Dens are often located in glacial cirque basins. In the winter of 2007 we used a geographic information system (GIS) to map potential wolverine den habitat on the ranger districts based on the den habitat model developed by Heinmeyer et al (2001). The selection criteria we used included:

- north and east aspects (320 to 130 degrees),
- elevations above 5500 feet,
- concave and flat slopes,
- rock and / or herbaceous cover types present,
- patch size at least six hectares (14.5 acres).

No den basins were mapped within the Misery Lake Project Area. The nearest mapped potential habitat is located up to ten air miles to the northeast.

Foraging Habitat - Wolverines are opportunistic scavengers that consume a wide variety of plant and animal food, with carrion (especially big game animals) serving as the mainstay of the animal's winter diet. They can kill big game animals under certain conditions such as in deep snow. Hornocker and Hash (1981) have suggested that timber harvest could improve habitat for big game and small mammal populations, thereby providing more prey for wolverines. Big game habitats have been described in the previous section on gray wolves. In late summer and fall, berry crops can be important to wolverines. There are very few acres of discrete berry shrub fields in the Misery Lake Project Area. Individual fruit-bearing shrubs are present in many forest stands.

Travel Corridors – Hornocker and Hash (1981) found no difference in the movements, habitat use, or behavior of wolverines that inhabited logged vs. un-logged habitats in their study site. In Idaho, wolverines commonly crossed natural openings and areas with little overhead tree canopy such as burned areas, meadows, and alpine areas (Copeland, 1996). In Washington they have been found in sagebrush habitats.

We mapped travel corridors for furbearers in the Lost-Ruby watersheds, which includes the Misery Lake Project Area, according to guidelines in Lowe (1995). All natural or created openings were avoided. Forest stands with open canopies were avoided to the extent feasible. Mapped corridors typically follow stream courses and ridgelines; natural routes of dispersal for furbearers.

Seclusion - See the previous section on gray wolves for a discussion of this habitat.

3. Effects of This Project

Effects to Foraging Habitat / Seclusion – See the sections on gray wolves and grizzly bears for a discussion of effects to ungulates, berry crops, and seclusion from human disturbance.

Effects to Travel Corridors

Alternative A – All potential overland travel routes would be maintained in their existing condition over the short term. Fuel loading and ladder fuels would continue to build up in the project area over time. The potential for a large, intense fire to remove conifer cover would continue to increase over the long run. In such an event, hiding cover would be removed in areas of high intensity burns and degraded in mixed or low severity burn areas. Wolverines moving through a large burned area could be vulnerable to human-caused disturbance or mortality, particularly near open roads.

Alternative B - Intermediate timber harvest (thinning, selection harvest) and low-intensity burning would occur with the Misery Lake project in mapped travel corridors for pine marten (see the section on fishers, later in this document). Overhead and horizontal cover would be maintained as per the requirements in Lowe (1995).

Cumulative Effects - Because of their huge home range requirements, a logical area to use for a characterization of cumulative effects to wolverines would be Pend Oreille County, which includes the Newport-Sullivan Lake Ranger Districts in their entirety.

Cumulative Effects to Foraging / Seclusion Habitats – See the sections on gray wolves and grizzly bears for a discussion of cumulative effects to these habitats.

Cumulative Effects to Travel Corridors – In the mid 1990s, the CNF adopted guidelines to maintain effective travel corridors for furbearers (Lowe, 1995). All ongoing and planned forest management projects would adhere to this direction. Although these corridors would provide cover for dispersing wolverines along preferred routes (streams, ridgelines) they are likely not entirely necessary for effective dispersal of these animals.

Private timber lands would continue to be converted to agriculture, residential, and other uses. The human population of the county would increase, as would vehicle traffic on state highways and county roads. The ability of wolverines to safely cross lands in the Pend Oreille River Valley would decrease over time.

5. Effects Determination
The likelihood of a wolverine establishing a den in the low elevation Misery Lake Project Area is small.

Alternative A would maintain existing foraging habitats for wolverines and their prey over the short-term. Forage opportunities for big game and small mammals would slowly decline as forest cover continues to grow. The risk of high-intensity fires in the area would increase incrementally over time. In the event of a large scale wildfire, forest cover could be removed over large areas, dramatically increasing browse and green forage production. The interiors of large burns may be under-utilized by big game.

Timber harvest and prescribed burning proposed with Alternative B would improve forage production for wolverines and prey animals over the short term. Alternative B would move the project area towards a more historic fire regime; one where forage would be maintained at more stable levels over time. However, this alternative would increase total road densities in the area, potentially increasing the risk of human-caused wolverine mortality. This risk would be greatly reduced or avoided by the proposed road entrance obliteration work. Thus, the alternatives as proposed may impact individual wolverines, but would not lead to a trend towards federal listing or a loss of viability of the species.

C. Townsend's big-eared bat (FS sensitive)

1. Management Framework - The Forest Plan provides no specific management direction for this species.

2. Existing Conditions – This bat is widespread in the Pacific Northwest where it is found in a variety of habitats. The presence of this species seems to be closely tied to the availability of suitable undisturbed roost, nursery, and hibernation sites (Washington Department of Fish and Wildlife, 1991). Caves, mine adits (tunnels), and abandoned buildings are all important habitats for Townsend's bats. The undersides of bridges are often used as roost or resting sites.

The Rathole, Triple H, and the Silver King mines lie roughly 0.5 mile outside of the Misery Lake Project Area. To date, big-eared bats have not been found at these sites, but their presence is a possibility. In recent years the FS closed two of these adits with metal gates having a "bat-friendly" design. These gates allow continued use of the sites by bats, while protecting them from human disturbance. Mines often contain serious hazards to the general public such as steep drop-offs, collapsing portals, bad air pockets, etc.

Big-eared bats have been documented roosting in a railroad tunnel between State Highway 20 and the Pend Oreille River. There are no other structures within the project area that are known to be used by bats.

3. Effects of This Project – No project activities would occur within 0.25 mile of any mine workings. A selection harvest / low intensity fire unit would be located near State Highway 20, opposite the Blueslide Tunnel. However, the unit would lie further than 600 feet from the tunnel and would be screened from the tunnel by an intervening forested ridge. Highway 20 lies between the tunnel and the proposed unit. There would be no direct, indirect or cumulative effects from this project to big-eared bats.

4. Effects Determination – Because all known potential roost / hibernating habitats would be avoided, the project as proposed would have no impact on this species.

D. Fisher (FS sensitive)

1. Management Framework - The Forest Plan has no specific direction for managing fisher habitat. However, it does provide for a forest-wide network of "core" reproductive habitat areas for other old growth associated species (pine marten, pileated woodpeckers, and barred owls). Where these areas are located in low to mid-elevation, moist forest stands, they could provide essential habitats for fishers.

Forested corridors are necessary for furbearers to move across a managed forest landscape and make full use of available blocks of habitat. The Forest Plan (as amended by Lowe in 1995) requires that at least two corridors be maintained between neighboring core habitat areas and other suitable stands. These corridors must be at least 400 feet wide. Medium or larger diameter trees in these areas should be common, and canopy closure should be within the top third of site potential. If stands meeting these criteria are not available, the next best stands should be used for connections.

In the west "Fishers are closely associated with forested riparian areas which are used extensively for foraging, resting, and as travel corridors" (Heinmeyer and Jones, 1994). Thus, direction in the Inland Native Fish Strategy (USDA, 1994) for the protection and maintenance of Riparian Habitat Conservation Areas (RHCAs) along forest streams could benefit this large member of the weasel family.

2. Existing Conditions – Fisher sightings are rare in northeast Washington. There are no known records of this species from the Misery Lake Project Area or the larger, Lost Creek and Ruby Creek watersheds. Biologists with the Washington Department of Fish and Wildlife did not detect fisher sign during recent, winter tracking surveys conducted in the watersheds (personal comm. with S. Zender).

Forest Habitats - Fishers prefer landscapes that have a high degree of mature forest cover. There is some evidence that they use habitats based more on the physical structure of the forest, and the prey associated with forest structures, rather than a specific forest type. Good overhead canopy closure, a diversity of tree sizes and shapes, and dead, downed wood are all important components of reproductive habitat

(Powell and Buskirk, in Ruggerio, et al, 1994). In addition, it appears that fishers appear to select "areas with a low canopy layer that occur in lowland habitat with dense overall canopy cover" (Kelly, in Ruggerio, et al, 1994).

Large (21+ inches in diameter) live and dead trees, and down logs provide fishers with foraging, resting, and den sites. Stand ages within the project area range primarily from 65 to 85 years old. Large live trees are below historic levels in the area due to intense wildfires that occurred in the 1930s, subsequent logging that focused on the remaining large trees, and the loss of white pine trees to blister rust. Because of these reductions in large live trees, large snags and logs are not common and are likely being recruited at a decreasing rate.

Old growth forest and other late successional stage stands provide the best reproductive and resting habitats for fishers. Old growth stands do not exist in the project area. There are approximately 232 acres of late and old structural stage stands (SS6) in the area. Stands in the middle stages of succession are typically deficient in large live and dead tree habitat. However, these stands can provide foraging habitats for fishers. In the Misery Lake Project Area, stands in middle structural stages are presently more common than they were historically. The same is true for lodgepole pine (LP) dominated stands. Stands dominated by LP typically have lower overhead canopy closures (50 percent or less) and lack a low canopy layer. Table 12 displays the relative availability of habitats in the Misery Lake Project Area.

Table 12. Existing condition of potential reproductive / resting habitat for fishers in the Misery Lake Project Area.

Potential Habitat	Total Acres (percent of project area)
reproductive habitat (SS 6)	232 (2 %)
Low quality reproductive habitat / foraging (SS 4, 5)	8,654 (61 %)
Foraging / unsuitable (SS 1, 2, 3, 7, lodgepole dominated)	4,052 (29 %)
Non-forest (unsuitable)	1,155 (8 %)

Habitat Connectivity – As they move across the landscape, fishers tend to avoid non-forested areas such as recent clearcuts, meadows, and areas above timberline. In these openings they are more vulnerable to predation. We mapped potential travel corridors for pine marten between designated core habitat areas and other stands of suitable habitat in the Misery Lake Project Area. We attempted to avoid all natural or created openings as well as forest stands with open canopies. Natural travel routes such as stream corridors and ridgelines were selected to the extent possible. Fishers could potentially use these corridors to disperse between areas of suitable habitat.

The project area contains a patchwork of land ownerships. As a rule, private forest lands are intensively managed, and parcels continue to be converted to agriculture / residential. Most over-story trees have been removed over large swaths or entire sections of private ownerships. The absence of overhead tree canopy would likely make it difficult for fishers and other furbearers to freely move across these lands.

3. Effects of This Project

Effects to Forest Habitats

Alternative A - No forest management would be initiated in the Misery Lake Project Area. Over long periods of time, more large trees that fishers require for den and rest sites could be recruited in those stands where trees have ample growing space. Over-stocked, stagnated stands of small diameter trees are unlikely to ever produce significant numbers of large trees. In many stands, dense understories of shade tolerant trees would continue to grow into the canopies of dominant ponderosa pine, western larch, and Douglas fir trees. Because of these fuel ladders, the risk of a wildfire ascending into the crowns of mature trees would continue to increase. Over time, mature lodgepole pine (LP) trees would become more susceptible to insect and disease attack across the project area. Large die-offs of LP would lead to heavy concentrations of fuels as they fall to the ground. These processes would increase the risk of a large, stand-replacing fire occurring in the project area. Such a catastrophic disturbance could remove large tree habitats, and late and old structural stage stands, at a watershed scale.

Alternative B - No timber harvest would occur within old growth forest stands (none exist) or within any structural stage 6 stands (multi-storied with large trees). No timber harvest would occur within designated core habitat areas for old growth associated species. The only large trees that would be harvested would be those that might exist within new road or equipment corridors. To the extent feasible, the Forest Service would require old equipment corridors to be re-used, and larger trees would be avoided when laying out new corridors.

No snags or hardwood trees would be harvested. Some of these trees would need to be cut down within new road or equipment corridors, or where they compromise worker safety. Felled trees would be left on site to contribute to down log levels.

Table 13 displays the proposed commercial timber harvest within potential fisher habitats.

Table 13. Commercial timber harvest in middle and late / old structural stage stands.

Harvest Prescription	Acres harvested (percent of total acres)		
	SS4 – stand re-initiation	SS 5 – multi-stratum without large trees	SS6 – multi-stratum with large trees
HSH (shelterwood)	218	20	0
HTH (commercial thin)	477	106	0
HSL (selection harvest)	80	45	0
HTH / HSH	1131	178	0

Commercial thinning and selection harvest would reduce tree stocking levels over hundreds of acres of stands in middle structural stages. Suppressed, intermediate and co-dominant trees would be targeted for harvest ("thin from below"). The inter-tree competition for sunlight, water, and soil nutrients would be reduced in the harvested stand. These harvests should promote the rapid development of larger, full-crowned trees sooner than had no treatment occurred. Fuel ladders would be reduced, lowering the risk of a ground fire ascending into the over-story tree canopy. The reduction in overall tree canopy biomass could make a fisher using the area more vulnerable to avian predators such as goshawks. In 15-20 years, tree crowns should grow to the point that the overhead canopy resembles pre-harvest levels.

Shelterwood harvest would mainly be applied in even-aged, stagnated stands with a major lodgepole pine component. These stands could provide marginal foraging habitat for fishers at best. The intent of regenerating these stands would be to establish a new cohort of early seral tree seedlings, capable of growing toward late structural stages.

Prescribed fire would be used to reduce fuel loads and work towards restoring the historic fire regime across thousands of acres in the project area. Dense clumps of regeneration and smaller ground fuels would be targeted for removal with these under-burns. Treated areas would be a mosaic of burned and un-burned sites. There would be places that the fires "skip" due to discontinuous fuels and moister forest types (ex. cedar / hemlock). In burned areas, 90 percent of the small fuels (0-1.0 inch diameter) would be consumed. Larger diameter fuels (1.0-3.0+ inches) would be consumed in relation to their diameter and moisture content. The lower the moisture content of the larger fuels, the greater the mass consumed. Some larger down logs are likely to be at least partially consumed, as are some standing snags.

Immediate, post-fire mortality of the overstory would be less than 10 percent of the tree basal area per acre (a low percentage would be expected). Some thin-barked, fire sensitive trees would be killed. A small pulse of snags would be created in burned areas. After a decade or so, most of these trees would have fallen to the ground to provide additional down log habitat. There would be some degree of scorch damage

on up to 40 percent of the live trees (a low percentage would be expected). Trees injured but not killed by these fires could develop heart rot or other defects that could provide opportunities for cavity excavation. Overstory tree canopy might be greatly reduced in small pockets, but overall impacts at the stand level should be small.

Effects to Habitat Connectivity

Alternative A - All potential travel routes for fishers would be maintained in their present state over the short term. Dependant on the tree stocking level and other factors, the suitability of travel routes could improve over time as younger trees in these areas grow and overhead cover increases. Due to past fire suppression practices and the resultant build-up of fuels, the potential for a large, hot wildfire is increasing in the Misery Lake Project Area. Such a fire could remove potential travel corridors and create large openings that would be avoided by fishers.

Alternative B- Intermediate timber harvest (thinning, selection harvest) and prescribed burning would occur within mapped travel corridors. This would result in a reduction in tree canopy biomass and might make fishers more vulnerable to avian predators such as goshawks. Enough tree basal area would be retained to meet the canopy closure requirement in Lowe (1995). In 15-20 years, tree crowns should grow to the point that the overhead canopy is restored to pre-harvest levels.

Low severity fires would mostly remove brush, conifer regeneration, and smaller fuels within mapped travel corridors. As a rule, horizontal cover would be degraded but not removed in areas that are under-burned. Many patches of conifer regeneration and shrubs should survive the fires, owing to discontinuous fuel concentrations. Even in well-burned areas, the line-of-sight visibility would still be broken up by dead and scorched regeneration, partially consumed logs, re-sprouting shrubs, and tree boles. Overhead canopy closure is unlikely to be much affected by these burns.

Cumulative Effects – The Ruby and Lost Creek Watersheds include many mature forest stands and miles of riparian coniferous forests. The watersheds are large enough to support several breeding pairs of fishers and are an adequate analysis area for cumulative effects.

Many timber sales have taken place in the watersheds on all ownerships. Most of these projects were designed to remove larger trees and old forest stands, and replace them with fast growing plantations of mostly seral tree species. This trend would continue on private ownerships. With the adoption of the Eastside Screens for Timber Sales (Lowe, 1995), timber sales on NFS lands are now designed to move watersheds closer to their historic range of variability for stand structural stages. In practice, this has meant that existing late and old structural stage stands have not been managed, since there are presently fewer acres of these stands than existed historically. Timber harvest is focused on moving mid-successional stage stands towards late and old structure, mainly through commercial thinning. In the short-term, these timber sales could negatively affect fisher habitat by reducing overhead canopy closure, and low canopy biomass. However, in the long-term, thinned stands will contain healthier,

more vigorously growing trees. Suitable reproductive habitat for fishers should be developed more rapidly in harvested stands than if they were left unmanaged. The risk of high-intensity wildfires should be reduced. Dead wood habitats would be maintained at levels prescribed in the "Eastside Screens for Timber Sales" (Lowe, 1995) at a minimum. No standing dead trees would be marked for harvest with the Misery Lake project. With any forest management project on NFS lands, forested corridors for furbearers would be identified and maintained.

Wetlands and other riparian habitats important to fishers would receive protection on private lands according to Washington State Forest Practices regulations. Buffers of standing trees would be left adjacent to these habitats, although the number and size of these trees would be much less than within designated riparian habitat conservation areas (RHCAs) on NFS lands.

5. Effects Determination
Fishers have not been documented in the project area or the Ruby and Lost Creek watersheds. Large blocks of mature, moist forest stands with structural complexity are rare in the watersheds. Alternative A would have no immediate impact to potential fisher habitat. This alternative would not address the increasing risk of catastrophic wildfire occurring in the area. Such fires could remove suitable den / resting structures and entire stands of suitable habitat. Alternative B would create short-term negative effects to low quality reproductive and foraging habitats but also initiate long-term positive trends in habitat development. Large snag and down log levels should not be significantly reduced. These impacts would be within the guidelines outlined in the "Eastside Screens for Timber Sales" (Lowe, 1995) and would not dramatically affect potential fisher habitat. The alternatives as proposed may impact individual fishers but are not likely to lead in a trend towards federal listing or loss of viability of the species.

E. great gray owl (FS sensitive)

1. Management Framework - Forest Plan (page 4-40) direction for raptors is to "manage the nest sites and surrounding areas to insure their continued usefulness to the respective species". The Forest Plan also provides for a forest-wide network of "core" reproductive habitat areas for old growth associated species (pine marten, pileated woodpeckers, and barred owls). These areas could provide reproductive habitats for great gray owls.

Management direction in the Inland Native Fish Strategy (USDA, 1995) within Riparian Habitat Conservation Areas (RHCAs), is to prohibit timber harvest except to "acquire desired vegetation characteristics where needed to attain Riparian Management Objectives". This direction is designed to maintain the integrity of streamside riparian and wetland habitats, and should benefit great gray owl prey species such as red-backed voles.

2. Existing Conditions – Great gray owl sightings are rare in northeast Washington. Although a few reliable observations of this species are on file from the Newport-Sullivan Lake Ranger Districts, nesting has never been documented. No great gray owl records exist from the Misery Lake project planning area or the Ruby and Lost Creek watersheds. We did not find evidence of this raptor during specific surveys for goshawks, or during general field review of stands proposed for harvest.

Great gray owls may utilize large, broken-topped snags and large platforms of mistletoe for nesting. They often occupy the abandoned nests of other raptors such as goshawks or red-tailed hawks. In British Columbia, breeding habitats for great gray owls primarily include Douglas fir forests with patches of aspen, but also Douglas fir / lodgepole pine cover types and lodgepole / spruce cover types. Nest stands are located in the vicinity of hunting habitats that include marshes, lakes, muskegs, wet meadows and pastures. Nest stands in the northwestern U. S. are strongly associated with extensive meadow systems, clear-cuts, and other forest openings (Hayward and Verner, 1994).

Within the project area there are roughly 232 acres of stands in structural stage (SS) 6. These stands are the most likely to provide the large live trees that are selected by the larger hawks for nesting. Such stands are also where large, broken-topped snags are most likely to be found. Potential nest structures might also be provided on some portion of the roughly 8,654 acres of SS 4 and 5 stands in the area.

Great gray owls forage for voles and other rodents in open, grassy habitats. In northeast Oregon, this owl may prefer to forage in open forests that have a heavy grass under-story (Hayward and Verner, 1994). Within the Misery Lake Project Area, the best potential foraging habitat likely occurs within riparian areas along Ruby Creek and the North Fork of Ruby Creek, existing meadows, pastures, and fields, and in areas of more recent regeneration harvest.

3. Effects of This Project

Effects to Nest Habitat

Alternative A – Large tree habitat would be recruited in the project area according to natural processes. Over-stocked, stagnated stands of small diameter trees are unlikely to ever produce significant numbers of large trees. Ground and ladder fuels would continue to accumulate in forest stands throughout the project area. The risk of an uncharacteristically hot wildfire occurring in the area would increase incrementally over time. Such a fire could remove suitable nest structures and entire nest stands for great gray owls.

Alternative B – No timber harvest would occur within old growth stands (none exist in the area) or within stands in structural stages 6 (multi-stratum with large trees) or 7 (single stratum with large trees). No timber harvest would occur within designated habitat areas for old growth associated species. Thus, the best potential nest stands in the project area would not be affected by timber harvest.

Timber harvest would focus on smaller diameter, suppressed, intermediate, and co-dominant trees or stands of stagnated trees. The vigor and growth of the residual trees in thinned stands should be improved, potentially accelerating the development of larger trees and late and old stand structure. The only large trees (21+ inches in diameter) that would be harvested anywhere in the project area would be those few that might exist within new road or equipment corridors, landings, or rock pits. To the extent possible, it is standard practice to utilize old equipment corridors, and avoid marking large trees in new corridors (personal comm. with J. Powell).

Existing snags would be retained within harvest units with the exception of those necessary to be felled within new equipment corridors, or for worker safety.

In areas proposed for prescribed burns, there would be untouched islands / pockets where there is not enough fuel to carry the fires. Some trees (particularly thin-barked species such as grand fir) could be killed immediately or become stressed from scorching and die at a later date. This might occur to individual trees or dense clumps of trees and should not be widespread in the treated areas. In burned areas, there should be less than 30 percent mortality for trees 8-12 inches in diameter, and less than 10 percent mortality for trees over 12 inches in diameter (low percentages would be expected). Large diameter, thick barked trees are most likely to survive these low-intensity fires. Some large diameter snags are likely to be lost. Overall impacts to large tree habitats at the stand level should be small.

Effects to Foraging Habitat

Both Alternatives – Over time, trees in existing plantations would grow into sapling and pole-sized conifers. These areas would then lose what value they presently have as potential great gray owl foraging habitat. Conifers would continue to encroach into old homestead meadows and other openings that are potential foraging areas for great gray owls. Livestock grazing would retard, but not halt this process. These meadows would require periodic maintenance to keep them in an open condition.

Alternative A - The forest canopy on NFS land would continue to close, decreasing habitat for voles and pocket gophers, the primary prey of great gray owls. Ground and ladder fuels would continue to accumulate in forest stands, elevating the potential for stand replacing wildfires to occur in the project area. In such an event, the increase in sunlight on the forest floor could stimulate the growth of grasses, forbs and shrubs, where their root systems are not entirely killed. Owl prey species could benefit from these increases in green forage.

Alternative B – Vegetation management proposed with this alternative would open up forest canopies and allow more sunlight to reach the forest floor. This would stimulate the growth of grasses and other ground vegetation, potentially benefiting rodent populations in the short term. The understories of harvested units or burned areas would be more open, improving hunting effectiveness for large-bodied birds of prey.

Cumulative Effects - The Lost and Ruby Creek watersheds contain some extensive riparian and meadow systems, pastures, powerline corridors, and hundreds of acres of regeneration harvest that could provide foraging habitats for great gray owls. Potential nest structures are present, although in low numbers. It appears that the watersheds could potentially support more than one breeding pair of this species. Thus, the watersheds are a reasonable area to use for cumulative effects analysis.

Cumulative Effects to Nesting Habitat – Up to the mid-1990s, when the Eastside Screens for Timber Sales (Lowe, 1995) were incorporated into the Forest Plan, nesting habitat declined in the watersheds because timber harvest sometimes removed entire stands of larger trees. Since that time, the Forest Service has not harvested healthy, live trees that are 21+" in diameter. We have also attempted to move watersheds closer to their historic condition in terms of stand structural stages. In practice, this has meant that timber harvest on NFS lands has focused on retaining stands in late and old structural stages, and accelerating the development of additional acres of these stands. Over the long term, this management regime should result in the gradual recruitment of additional nesting habitat on NFS lands.

On private lands, the conversion of late and old structural stage stands to plantations is nearly complete and will likely continue. Forest lands will continue to be permanently converted to other uses such as agriculture and residential.

Cumulative Effects to Foraging Habitat – The Misery Lake, Brown's Lake, and future forest management projects in the watersheds would contribute to the creation of open foraging habitats on NFS lands. These projects would open up the understories of many timber stands, making the forest floor more accessible to large avian predators.

Powerline corridors, pastures, fields, and other created openings on private lands could be exploited by great gray owls as foraging sites; particularly where these openings border forest stands.

5. Effects Determination – A this time, great gray owls appear to be infrequent visitors to the ranger districts during migrations. Nesting has not been documented. Alternative A would maintain potential habitats for great gray owls over at least the short-term. This alternative would not address the increasing risk of a high-intensity fire removing nest structures and nest stands over large areas. Alternative B would reduce the risk of future, intense fires in the project area, and improve forage resources for rodents over the short term. Vegetation management with this alternative would be designed accelerate the development of late and old stand structural stages. The alternatives as proposed may affect individual great gray owls, but are not likely to lead to a trend toward Federal listing or loss of viability of the species.

F. northern leopard frog, sandhill crane, eared grebe (FS sensitive)

1. Management Framework - The Forest Plan provides no direction for managing habitat specifically for these species. Management direction in the Inland Native Fish Strategy (USDA, 1995) is to prohibit vegetation management within Riparian Habitat Conservation Areas (RHCAs) except to "acquire desired vegetation characteristics where needed to attain Riparian Management Objectives". This direction should work to protect breeding habitats of all three species.

2. Existing Conditions

northern leopard frogs - In a 1995 survey, northern leopard frogs were found a few miles from the project area on the east side of the Pend Oreille River (McAllister, et al, 1999). The Kalispel Tribe reported an animal found roughly two miles south of that location in 2003 (personal comm. with R. Entz, 2003). In the summer of 2000, the Forest Service completed surveys of the major wetlands and lakes in the project area with help from L. Hallock, Washington Department of Natural Resources Herpetologist. No leopard frogs were found during these surveys (Hallock, 2003).

Northern leopard frogs prey upon insects, spiders, sowbugs, leeches, fish, amphibians, snakes, and small birds (Leonard et al, 1993). They require temporary ponds with abundant concealing cover, for breeding. Breeding ponds in Minnesota have a maximum depth of 5-6 feet, do not support fish, are not connected to other bodies of water, and dry up periodically (Merrell, 1977, in McAllister, et al, 1999). After breeding, adult frogs may move far away from water to a variety of nearby habitats. They tend to avoid wooded areas, open areas without vegetation or heavily grazed or mowed areas. In Minnesota they prefer moving through vegetation that is 6-12 inches tall (Merrell 1977 in McAllister et al, 1999). This frog hibernates on the bottom of permanent, deepwater ponds and slow moving streams. Over-wintering sites are typically located within one mile of breeding ponds.

Sandhill cranes – Sightings of this species are rare in northeast Washington. The Forest Service has no record of cranes nesting anywhere on the Colville National Forest. However, individual birds have been observed in Tiger Meadows in recent years in the springtime. For several years, a single bird used the area for several days, apparently resting and foraging. Tiger Meadows is located several miles north of the Misery Lake Project Area.

Sandhill cranes require large expanses of undisturbed marshes or wet and dry meadows where visibility is good from all vantage points (WDFW, 2003). They eat a wide variety of plants and animals including grains, plant materials, invertebrates, amphibians and small mammals (Reinecke and Krapu, 1986; Tacha et al, 1992; Davis and Vohs, 1993; USDI, Fish and Wildlife Service, 1978; Littlefield, 1995, in WDFW, 2003). These birds tend to feed in areas of short vegetation.

"Emergent vegetation is a key component of nesting territories, and nests are typically placed on piles of emergent vegetation, grass, and mud" (Littlefield and Ivey, 2001).

Nests are concealed in patches of medium to tall vegetation that can include sedges, spikerushes, rushes, forbs, various native grasses, and reed canary grass (Littlefield and Ivey, 2001). Cranes prefer to nest further than ¼ mile from open roads. Squirrel Meadows and McElroy Meadows could provide some low quality habitat for this species.

Eared grebes – The ranger districts have no records of this bird from the Misery Lake Project Area or the larger Ruby and Lost Creek watersheds. Grebes are duck-like diving birds with flat, lobed toes, thin necks, and a tail-less appearance. Eared grebes nest in colonies on prairie lakes or marshes. The nearest known nest colony is located at Turnbull National Wildlife Refuge, many miles south of the project area. Individuals of this species are occasionally sighted outside the nesting season on large lakes and rivers in northeast Washington.

The following table displays the acres of potential habitats in the Misery Lake Project Area for these three wetland associated species.

Table 14. Summary of potential wetland habitats in the Misery Lake Project Area.
(adapted from USDI, 1987).

Wetland Habitat (Class)	Water Regime	Acres
lake (open water)	permanent	14.4
pond (open water)	permanent	1.4
pond (aquatic bed)	permanent	9.9
wetland (emergent)	seasonally flooded	139.7
wetland (emergent)	semi-permanent	28.0
wetland (deciduous forest)	seasonally flooded	44.7
wetland (deciduous shrub/scrub)	seasonally flooded	154.9

3. Effects of This Project

All Alternatives - All potential habitats for leopard frogs, sandhill cranes, and eared grebes would be maintained in the project area, at least in the short term. Over time, certain wetlands and ponds in the area might be lost to natural forest succession, reducing the availability of these sites to amphibians and waterfowl. This process could be reversed through water impoundments created by beavers. Conifers would continue to encroach into old homestead meadows and other openings on NFS lands. Livestock grazing would retard, but not halt this process. These meadows would require periodic maintenance to keep them in an open condition.

Alternative B - No timber harvest or mechanical fuels reduction would occur within 50 feet of any wetland less than one acre in size or within 100 feet of wetlands larger than one acre. Riparian Habitat Conservation Areas (RHCAs) have been designated along streams by the forest fish biologist according to guidelines in INFISH. Timber harvest would not occur within RHCAs. Thus, harvest activities should not impact

existing aquatic, emergent, and riparian, vegetation that could provide habitats for these species. New roads would not impact wetlands or meadows.

Alternative B would use prescribed fire to reduce forest fuel loads and work towards restoring the historic fire regime in the area. Brush, dense clumps of regeneration, and smaller fuels would be targeted for removal. Aquatic and emergent vegetation is too wet to be impacted by these low intensity fires. The above-ground parts of riparian plants could be removed or scorched in some local areas. However, these plants should re-sprout from their root systems and fully recover within a few growing seasons.

Sandhill cranes or eared grebes using habitats in the project area could be disturbed by the human presence and noise associated with project activities. There would be a remote chance that leopard frogs dispersing overland could perish in a burned area, or an area of equipment operation. During the life of the project, individuals of these species discovered in the area would be protected through project timing restrictions.

Cumulative Effects – The Lost and Ruby Creek watersheds contain hundreds of acres of ponds, wetlands and meadows that could provide essential habitats for these species. The watersheds are a logical unit of land to use for analyzing cumulative effects.

With ongoing and planned timber sales on NFS lands in the watersheds, wetlands and ponds would be buffered in the same manner as the Misery Lake project. On private lands, these habitats would receive protection according to Washington State Forest Practices regulations. Standing trees would be left adjacent to these habitats, although the numbers and sizes of trees would be much less than that required for harvest units on NFS lands.

To the extent necessary and feasible, the Forest Service would attempt to maintain the major meadow complexes in the watersheds. This could be accomplished with periodic conifer removal, prescribed burning, and weed treatments. Where these treatments are successful, they could potentially benefit sandhill cranes by perpetuating open meadow environments.

4. Effects Determination – There are no known records of northern leopard frogs, sandhill cranes, and eared grebes from the Misery Lake Project Area. While individual leopard frogs dispersing overland in the area could perish in prescribed burns or from logging operations, their essential habitats should be protected by avoidance. Any riparian vegetation that is impacted by prescribed fires should quickly recover. Timber harvest and road construction would avoid essential habitats. Thus, the alternatives as proposed may impact individuals of these three species, but are not likely to result in a trend to federal listing or loss of viability of any of the species.

VII. SUMMARY OF EFFECTS

The following table provides a brief summary of the effects of the proposed Misery Lake Timber and Fuels Management Project on threatened, endangered, and sensitive species (TES) including the rationale for each determination.

Table 15: Summary of effects of the Misery Lake Project to TES species.

Species	Alternative	Determination	Rationale for Determination
gray wolf (endangered)	A	may effect, not likely to adversely affect	Project is outside recovery habitat. Increasing fuel loads would continue to elevate the risk of forest cover loss to future, hot fires. Such fires could promote big game forage.
	B		Temporary reduction in seclusion from project activities. Increase in total road density but road closure work part of project design. Roadside hiding cover maintained where feasible. Reduced risk of fires removing cover for big game. Potential for local improvements in green forage/ upland shrub growth from timber harvest and under-burning.
grizzly bear (threatened)	A	may effect, not likely to adversely affect	Project is outside recovery habitat. Increasing fuel loads would continue to elevate the risk of forest cover loss to future, hot fires. Such fires could promote forage.
	B		Temporary reduction in seclusion from project activities. Increase in total road density but road closure work part of project design. Roadside hiding cover maintained where feasible. Potential for local improvements in forage from burning and timber harvest.
Canada lynx (threatened)	A and B	no affect	Project lies outside primary lynx range. Activities would not occur within the vicinity of any known lynx den site. Project is consistent with Lynx Conservation Assessment and Strategy.
bald eagle (FS sensitive)	A	not likely to cause a trend to federal listing	No immediate impacts to any existing habitats. Increasing fuel loads would continue to elevate the risk of large tree loss to future, high intensity crown fires.
	B		No large trees marked for harvest. Large tree habitat promoted through thinning. Known nest and foraging areas avoided.
wolverine (FS sensitive)	A and B	not likely to cause a trend to federal listing	Same as for gray wolves.
Townsend's big-eared bat (FS sensitive)	A and B	no impact	All known occupied and potential habitats avoided.
Fisher (FS sensitive)	A	not likely to cause a trend to federal listing	No known records from the area. Minor amounts of potential habitat. No immediate impacts to potential habitats but increasing fuel loads would continue to elevate the risk of habitat loss to future, hot wildfires.
	B		Reduction in canopy closure and horizontal cover for possibly 15 years. Decreased risk of large forest structures (live and dead trees and down logs) being consumed by wildfire. Large tree habitat promoted through thinning.
great gray owl (FS sensitive)	A and B	not likely to cause a trend to federal listing	Same as for fishers.

Species	Alternative	Determination	Rationale for Determination
northern leopard frog, sandhill crane, eared grebe (FS sensitive)	A	no impact	Species not found during field surveys. No known records from the area. Essential habitats (wetlands, ponds, etc.) avoided.
	B	not likely to cause a trend to federal listing	

Section 4.3.2 of the Environmental Management System for the Colville National Forest requires that applicable legal requirements are applied during project analyses. By signature below, I certify that this analysis follows the applicable direction found in Forest Service Manual 2620 and 2630.

This report was prepared by:

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Appendix A

Risk Assessment Procedure (for threatened and endangered species**)**
Forest Service (Region 6) Supplement 2600-90-5, FSM 2672.24b-2676.17e

Likelihood of Adverse Effects

None:	Activity will not affect habitat or population (no further risk assessment is needed)
Low:	Activity controllable by seasonal or spatial restrictions and not likely to affect habitat or populations.
Moderate:	Activity not completely controllable or intense administration of project needed to prevent adverse effects on habitat or populations.
High:	Activity not controllable and adverse effects on habitat or populations likely to occur.

NOTE: Any adverse affects to federally listed species will require initiation of consultation process.

Consequence of Adverse Effects

Low:	None, or questionable adverse effect on habitat or population. No cumulative effects expected.
Moderate:	Possible adverse effects in habitat or on population. Cumulative effects possible.
High:	Obvious adverse effects on habitat or population. Cumulative effects probable.

Risk Index
None=0
Low=1
Moderate=5
High=10

Multiply Likelihood value times Consequence value to determine Risk value.

Risk Value/Action

0	Proceed with project
1-10	Proceed as planned.
10-50	Modify project if feasible to reduce risk.
50-100	Project must be modified, cancelled or have further analysis done.

NOTE: Subsequent activities in the assessment area with index of 25 or more must be modified if previous effects have not been mitigated.

Newport RD

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Upper Columbia Fish and Wildlife Office
11103 East Montgomery Drive
Spokane, Washington 99206

TAKE PRIDE IN AMERICA

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NOV 30 2007
BY: _____

November 27, 2007

Rick Brazell, Forest Supervisor
Colville National Forest
Headquarters Office
765 South Main
Colville, WA 99114

Subject: Misery Lake Timber and Fuels Management Project
FWS Reference 1-9-08-I-0016 (File #118.0300)

Dear Mr. Brazell:

This responds to your October 18, 2007, letter requesting informal consultation on the Misery Lake Timber and Fuels Management project in Pend Oreille County, Washington. We understand that the project involves 2,815 acres of commercial timber harvest and 6,624 acres of non-commercial treatments including prescribed burning and pre-commercial thinning within the 14,093 acre Misery lake project area. Road work includes 4.8 miles of new construction, 20.8 miles of road reconstruction and 0.5 miles of temporary roads. Your letter, with a biological evaluation (BE), was received in this office on October 22, 2007, and requested our concurrence with your determinations of effect for gray wolf, grizzly bear, bull trout and designated bull trout critical habitat.

The U.S. Fish and Wildlife Service (Service) concurs that the proposed project, as described in the BE, is "not likely to adversely affect" gray wolf, grizzly bear, bull trout or designated bull trout critical habitat. This decision is based on the fact that there are no known wolf packs or dens on the Colville National Forest, and forage for big game winter ranges would be improved with project activities. This decision is also based on the fact that the project area lies outside designated recovery habitat for grizzly bears, and bears will likely avoid the project area during project activities. Bull trout are not known to inhabit Ruby Creek, however, since there will be minimal road rerouting in the Ruby Creek drainage, as well as project activities occurring outside the RHCA, project activities will result in a not likely to adversely affect determination for bull trout and designated bull trout critical habitat. Project activities will occur in the South Fork Lost Creek drainage, however, these will occur in upland areas far removed from the creek, and are expected to have no effect to bull trout. Concurrence by the Service is contingent upon implementing the project as described in the BE.

This concludes informal consultation pursuant to section 7(a)(2) of the Endangered Species Act of 1973, as amended (Act). This project should be re-analyzed if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in this consultation; if the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this consultation; and/or, if a new species is listed or critical habitat is designated that may be affected by this project.

If you have further questions about this letter or your responsibilities under the Act, please contact Carrie Cordova of this office at 509-893-8022.

Sincerely,

Suzanne Audet

for Supervisor

c: WDFW, Region 1

Amy L Dillon/R6/USDAFS
04/19/2008 01:06 PM

To Marcy J Rumethart/R6/USDAFS@FSNOTES
cc
bcc
Subject Fw: misery lake be addendum

----- Forwarded by Amy L Dillon/R6/USDAFS on 04/19/2008 01:06 PM -----

Michael A
Borysewicz/R6/USDAFS
12/10/2007 01:24 PM

To Amy L Dillon/R6/USDAFS@FSNOTES
cc James E McGowan/R6/USDAFS@FSNOTES, Michael A Borysewicz/R6/USDAFS@FSNOTES
Subject misery lake be addendum

It has come to my attention that the Forest Plan Management Area (MA) acres I reported in my Biological Evaluation (BE) and management indicator species document for the Misery Lake Timber and Fuels Management Project, are slightly off. Due to a recent land aquisition, the Colville National Forest now has an additional 82 acres of land in the project area that is classed as MA6; Scenic / Big Game Winter Range. This update in acres reported does not cause any significant change to the effects analysis in the BE and management indicator species documents. The effects determinations for threatened and endangered species remain as originally reported in the BE. Please use this message as an addendum to these documents in the project file.

Michael A. Borysewicz, Wildlife Biologist
Colville National Forest
Newport-Sullivan Lake Ranger Districts
12641 Sullivan Lake Road, Metaline Falls, WA 99153
509-446-7500
mborysewicz@fs.fed.us