Terrestrial Wildlife

Introduction

Management of terrestrial species and habitat and maintenance of a diversity of animal communities, is an important part of the mission of the Forest Service (Resource Planning Act of 1974, National Forest Management Act of 1976). Management activities on National Forest System (NFS) lands are planned and implemented so that they do not jeopardize the continued existence of threatened or endangered species or lead to a trend toward listing or loss of viability of Forest Service Sensitive species. In addition, management activities are designed to maintain or improve habitat for Management Indicator Species (MIS) to the degree consistent with multiple-use objectives established in each Forest LRMP. Management decisions related to motorized travel can affect terrestrial species by increasing human-caused mortality, changing behavior due to disturbance and modifying habitat (Gaines et al. 2003, Trombulek and Frissell 2000, USDA-FS 2000). It is Forest Service policy to minimize damage to vegetation, avoid harassment to wildlife and avoid significant disruption of wildlife habitat while providing for motorized use on NFS lands (FSM 2353.03(2)). Therefore, management decisions related to motorized travel on NFS lands must consider effects to wildlife and their habitat.

Analysis Framework: Statute, Regulation, Forest Plan (LRMP) and Other Direction

Direction relevant to the proposed action as it affects terrestrial biota includes:

Endangered Species Act (ESA)

The Endangered Species Act of 1973 (16 USC 1531 et seq.) requires that any action authorized by a Federal agency not be likely to jeopardize the continued existence of a threatened or endangered (TE) species or result in the destruction or adverse modification of habitat of such species that is determined to be critical. Section 7 of the ESA, as amended, requires the responsible Federal agency to consult the USFWS and the National Marine Fisheries Service concerning TE species under their jurisdiction. It is Forest Service policy to analyze impacts to TE species to ensure management activities are not likely to jeopardize the continued existence of a TE species or result in the destruction or adverse modification of habitat of such species that is determined to be critical. This assessment is documented in a Biological Assessment (BA) and is summarized or referenced in this chapter.

Forest Service Manual and Handbooks (FSM/H 2670)

Forest Service Sensitive (FSS) species are species identified by the regional forester for which population viability is a concern. The Forest Service develops and implements management practices to ensure that rare plants and animals do not become threatened or endangered and ensure their continued viability on National Forests. It is Forest Service policy to analyze impacts to sensitive species to ensure management activities do not create a significant trend toward Federal listing or loss of viability. This assessment is documented in a Biological Evaluation (BE) and is summarized or referenced in this chapter.

Sierra Nevada Forest Plan Amendment (SNFPA)

The Record of Decision (ROD) for the 2004 Sierra Nevada Forest Plan Amendment identified the following standards and guidelines applicable to motor vehicle travel management and terrestrial wildlife, which will be considered during the analysis process:

Wetland and Meadow Habitat (Management S&G 70): See Water (Aquatic) Resources section.

California Spotted owl and Northern Goshawk (Management S&G 82): Evaluate proposals for new roads, trails, off-highway vehicle routes and recreational and other developments for their potential to disturb nest sites.

Under the Sierra Nevada Forest Land Management Plan Amendment protected activity centers (PACs) will be established for known and discovered northern goshawks (200 acres) to protect breeding adults and their offspring. Designate northern goshawk PACs based upon the latest documented nest site and locations(s) of alternate nests. If the actual nest site is not located, designate the PAC based on the location of territorial adult birds or recently fledged juvenile goshawks during the fledgling dependency period. A limited operating period (LOP) will be maintained within approximately 0.25 mile of the nest site during the breeding season (February 15 through September 15) unless surveys confirm that northern goshawks are not nesting. If the nest stand is unknown, either apply the LOP to a ¼ mile area surrounding the PAC or survey to determine the nest stand location (S&G# 76, ROD, p 60).

Surveys will be conducted when activities are planned within or adjacent to a PAC to establish or confirm the location of the nest or activity center.

Fisher and Marten (Management S&Gs 87 and 89): Evaluate proposals for new roads, trails, off-highway vehicle routes and recreational and other developments for their potential to disturb den sites.

Riparian Habitat (Management S&G 92): See Water Resources section.

Bog and Fen Habitat (SNFPA ROD page 65, S&G #118): Prohibit or mitigate ground-disturbing activities that adversely affect hydrologic processes that maintain water flow, water quality or water temperature critical to sustaining bog and fen ecosystems and plant species that depend on these ecosystems. During project analysis, survey, map and develop measures to protect bogs and fens from such activities as trampling by livestock, pack stock, humans and wheeled vehicles (See Botany Resources section for more detail.

The Southern Sierra Fisher Conservation Area

The conservation strategy (SNFPA ROD, USDA-FS 2004a) contains four critical elements for fisher conservation: 1) it provides management direction for the Southern Sierra Fisher Conservation Area to support fisher habitat requirements; 2) it provides for suitable habitat linkages between southern and northern Sierra Nevada fisher populations; 3) it provides protection for all den sites; and 4) it provides suitable habitat for possible fisher reintroductions.

The Southern Sierra Fisher Conservation Area (SSFCA) encompasses the known occupied range of the fisher in the Sierra Nevada. This consists of an elevational band from 3,500 feet to 8,000 feet (errata March 2001e) on the Sierra and Sequoia National Forests. This area will be managed to support fisher habitat consistent with the protections for the California spotted owl.

The standard and guideline # 87 will also be implemented which states mitigate impacts where there is documented evidence of disturbance to the den site from existing recreation, motor vehicle route, trail and road uses (including road maintenance). Evaluate proposals for new roads, trails, motor vehicle routes and recreational and other developments for their potential to disturb den sites.

Sierra National Forest Land and Resource Management Plan

The LRMP management direction for sensitive species is to develop and implement management practices, referred to as standards and guidelines, to ensure sensitive species do not become threatened or endangered because of Forest Service actions. Under LRMP standards and guidelines, the SNF is to arrange management activities to protect and preserve nests and dens of

all sensitive wildlife species until young have dispersed (S&G #53); similarly, LRMP management direction for Federally listed threatened and endangered species is to manage them according to their recovery plans (USDA-FS 1991). The LRMP Forestwide Goals and Objectives for Threatened, Endangered, Proposed and Sensitive species are:

- Manage fish, wildlife and plant habitats to maintain viable populations of all resident fish, wildlife and plant species.
- Manage habitat for State and Federally listed threatened and endangered fish, wildlife and plant species to meet the objectives of their recovery plans.
- Emphasize habitat improvement for sensitive, threatened, endangered and harvest species.

Manage habitat for Forest Service sensitive fish, wildlife and plant species in a manner that prevents any species from becoming a candidate for threatened or endangered status.

There is specific management direction listed here for the goshawk because it identifies information that is unique due to the LRMP direction listed below. This direction is in addition to what is listed in the SNFPA ROD.

- Under LRMP management direction, 55 goshawk territories have been established on the SNF. The LRMP standard and guidelines provide for up to 50 acres of suitable habitat encompassing goshawk nest sites to be managed to benefit goshawks (S&G #56). Additionally, in the Errata to the Record of Decision Final Environmental Impact Statement, SNF LRMP (USDA-FS September 24, 1991a) - Management Standard and Guidelines (Page 1), two guidelines for goshawks were identified. A 50-acre primary zone of older mature forest surrounding the occupied or potential nest site and a secondary zone of 75 acres around the primary zone will have a limited operating season between March 15 and August 15 or a limited operating season based on site specific information. As directed in the LRMP, a network of goshawk territories has been developed on the SNF. The network and guidelines for management of the goshawk territories has been approved by the Forest Supervisor (USDA-FS 1997). For each goshawk territory, these guidelines call for managing 175 contiguous acres to benefit the goshawk.

Effects Analysis Methodology

The species assessment presented here is organized by Species Groups divided along major habitat associations or life zones. Projected effects of motor vehicle travel management on sets of species in these major groupings are described. In addition, individual species assessments are presented for Federally listed species, Forest Service Sensitive Species and Management Indicator Species. More detailed information is also found in the Biological Assessment/Evaluation for Motorized Travel Management (Sorini-Wilson, 2009) and Project Management Indicator Species report, SNF (Strand and Sanchez 2009) and are incorporated by reference.

This assessment consists of 4 steps: (1) identify wildlife species and groups; (2) identify road and trail associated factors for each group; (3) develop and apply assessment processes and GIS models to evaluate the influence of road and trail associated factors on each group; and (4) analyze the effects of the proposed alternatives based on the model outputs and analyses.

Table 163. Identify Wildlife Special Status Species on the Sierra National Forest

Species	Federally Listed Threatened/ Endangered	Forest Service Sensitive	Management Indicator Species (MIS)	Category for Project Analysis*	CWHR	Habitat Indicator	Distribution on SNF and in the Project Area
Fresno kangaroo rat	x					The nearest habitat is found in the southwestern portion of the San Joaquin Valley.	Project area is above elevational limit for species.
Sierra Nevada bighorn sheep	x					East slope of the Sierra Nevada's on the Inyo NF at Wheeler Crest, Mt Baxter and Mt Williamson. Found in mountainous habitat containing rolling meadows and plateaus in proximity to steep rocky terrain, often w/80% slopes on southerly aspects.	Project area is not habitat
California condor	x					Open terrain and roost on cliffs and large trees.	Project area is not habitat
Valley elderberry longhorn beetle	x					Elderberry shrubs; covered under programmatic consultation	There is habitat within the project area.
Bald eagle		x				Mature conifer forest near large bodies of water	Nests near large reservoirs across the Forest
Peregrine falcon		x				On SNF known or suspected eyries occur along or near the North and South Kings River, San Joaquin River and Merced River. Requires protected cliffs and ledges for cover.	Vehicles will not be travelling or disturbing suitable habitat
California spotted owl		x	x	3	6, 5D, 5M, 4D, 4M	Late Seral Closed Canopy Coniferous Forest; Mature and late-successional conifer forest	Suitable habitat across Forest.

Species	Federally Listed Threatened/ Endangered	Forest Service Sensitive	Management Indicator Species (MIS)	Category for Project Analysis*	CWHR	Habitat Indicator	Distribution on SNF and in the Project Area
American marten		x	x	3	6, 5D, 5M, 4D, 4M	Late Seral Closed Canopy Coniferous Forest	Suitable habitat across Forest.
Pacific fisher		x			5D, 4D**	Mature and late-successional conifer forest	Suitable habitat across Forest; known den sites
California wolverine		x					Suitable habitat on Forest. No known or verified sightings. Habitat not affected by the project.
Sierra Nevada red fox		x				Mature subalpine conifer forest and riparian/montane meadow	Suitable habitat on Forest. No known or verified sightings. Habitat not affected by the project.
Northern goshawk		x			4D, 4M, 5D, 5M	Late Seral Closed Canopy Coniferous Forest	Forestwide
Great gray owl		x			5D, 5M, 6	Mature and late-successional conifer forest adjacent to meadows	Suitable habitat across Forest.
Willow flycatcher		x				Riparian shrub (willow) and wet meadow	Specific mdws; 9 known occupied sites.according to Framework
Western red bat		x				Riparian habitat and hardwoods within riparian areas; roosts within tree foliage or shrubs and often along edge habitat adjacent to streams or open fields (Bolster 1998)	Habitat is generally below 3000 feet in elevation

Species	Federally Listed Threatened/ Endangered	Forest Service Sensitive	Management Indicator Species (MIS)	Category for Project Analysis*	CWHR	Habitat Indicator	Distribution on SNF and in the Project Area
Pallid bat		x				Affinity for oak and mixed hardwood conifer, Roost sites can include buildings, mines, caves and live oak trees and oak snags.	Habitat is generally below 10,000 feet in elevation
Townsend's big-eared bat		x					Habitat is generally below 6000 feet in elevation
Fox sparrow			x	3		Shrubland (west-slope chaparral types)	
Mule deer			x	3		Oak-associated Hardwood and Hardwood/conifer	
Yellow warbler			x	3		Riparian	
Mountain quail			x	3		Early and Mid Seral Coniferous Forest	
Blue grouse			x	3		Late Seral Open Canopy Coniferous Forest	
Northern flying squirrel			x	3		Late Seral Closed Canopy Coniferous Forest	
Hairy woodpecker			x	3		Snags in Green Forest	
Black-backed woodpecker			x	2		Snags in Burned Forest	

*The column marked 'category for project analysis' is only for MIS species/habitat. The categories are as follows: Category 1: MIS whose habitat is not in or adjacent to the project area and would not be affected by the project; Category 2: MIS whose habitat is in or adjacent to project area, but would not be either directly or indirectly affected by the project; Category 3: MIS whose habitat would be either directly or indirectly affected by the project. **Habitat is based on CWHR Version 8.1 (Modified) and current research.

There will be no direct or indirect effects to wolverine or Sierra Nevada red fox because their habitat is not being impacted with this project; therefore, these species will not be addressed further in this document. The Sierra Nevada red fox uses dense vegetation and rocky areas which pertain to a portion of the wilderness. There are no routes in the wilderness; therefore, the habitat is not being impacted.

Wolverine habitat as described by Zeiner et al 1990, is areas of low human disturbance such as caves, hollows in cliffs, logs, rock outcrops and burrows for cover. They den in similar habitat. There are no routes in this type of habitat; therefore, the habitat is not being impacted.

ASSUMPTIONS SPECIFIC TO THE TERRESTRIAL BIOTA ANALYSIS:

1. All vehicle types result in the same amount of disturbance effect to wildlife, unless there is local information enabling a separate analysis by vehicle type.
2. Location of trail is equal to disturbance effects from that trail (i.e., assume all trails provide the same level of disturbance), unless local data or knowledge indicate otherwise.
3. Habitat effectiveness and suitability is negatively impacted in the short-term. In the long-term, habitat effectiveness and quality will not change on or near added routes, but will increase to at least some degree due to subsequent passive restoration on or near unauthorized routes that are not added to the NFTS.

Data Sources:

1. GIS layers with the following information: routes; habitats; and 'designated' or important wildlife areas.

- The following GIS layers were used to assess effects of the routes and areas proposed to be added to the NFTS: California spotted owl protected activity centers (PACs) and Home Range Core Areas (HRCAs), along with known nest sites, territorial pairs and individual sightings; goshawk PACs and territories; great gray owl PACs; Deer Population Centers, Holding Areas, Winter Range and Migration routes; FAUNA database of incidental sightings for TES species; and past survey results.
- To determine suitable habitat, the vegetation layer used is a combination of 1993 and 1997 vegetation layers. The combination of the 1993 and 1997 layers was implemented because it was determined by resource managers that the 1997 vegetation was more accurate regarding density for mixed conifer in the elevations roughly 5000 feet and above and the 2001 vegetation layer was more accurate for the elevation 5000 feet and below, for Ponderosa pine (developed for the SNF by the USDA Remote Sensing Lab). Meadow and plantation data were also embedded in the suitable habitat vegetation layer used for this project analysis.

2. Site specific surveys/assessment of any localized sensitive wildlife habitats where routes were proposed to be added to the NFTS.

Northern goshawk surveys were conducted according to Survey Methodology for Northern goshawks in the Pacific Southwest region, Forest Service (USDA, 2002); California spotted owls were surveyed according to Protocol for Surveying for California spotted owls in proposed management areas and habitat conservation areas (USDA, 2006) and Pacific Southwest Research Stations method; great gray owl surveys were conducted using survey protocol for the great gray owl in the Sierra Nevada of California, May 2000 (Beck and Winter 2000); furbearer surveys have been conducted by Pacific Southwest Research station and UC Berkeley using survey methods that are a mix of baited camera stations, hair snares, scat dogs and tracking radio-collared individuals.

Field visits were also conducted when reconnaissance through GIS suggested further field data was needed. When visiting routes/areas, field data was recorded for habitat type, canopy cover and suitability of wildlife habitat. Details of field visits and forms are on file at the High Sierra Ranger District, wildlife biology office.

TERRESTIAL BIOTA INDICATORS

- Acres open to motorized use and miles of unauthorized routes within terrestrial biota habitat.
- Density of motorized routes at the 6th field watershed level.
- Miles of motorized routes at forestwide scale and within the habitat for each species group.
- Number of sensitive sites for Threatened, Endangered and Sensitive (TES) species (e.g., Protected Activity Core [PACs], nest sites, winter roost areas) within ¼ mile of an added route or area.
- The proportion of a species (or species group's) habitat that is affected by motorized routes/areas.

TERRESTRIAL BIOTA METHODOLOGY BY ACTION:

1. Direct/indirect effects of the prohibition of cross-country motor vehicle travel.

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: Ten analysis units, wilderness excluded because motorized use is not allowed.

Indicator(s): Acres open to motorized use and miles of unauthorized routes within terrestrial biota habitat.

Methodology: GIS analysis of existing unauthorized routes in relation to habitat.

Rationale: Studies have documented that motorized travel can affect terrestrial species by increasing human-caused mortality, changing behavior due to disturbance and modifying habitat (Gaines et al. 2003, Trombulek and Frissell 2000, USDA-FS 2000).

2. Direct/Indirect Effects of adding facilities (presently unauthorized roads, trails and/or areas) to the NFTS, including identifying seasons of use and vehicle class.

Considerations: Display information related to indicators in tabular form (indicators by alternatives).

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: Ten analysis units, wilderness excluded because motorized use is not allowed.

Indicator(s): (1) Density of motorized routes; (2) Miles of motorized routes; (3) Number of sensitive sites for TES species (e.g., PACs, nest sites, winter roost areas) within ¼ mile of an added route or area; (4) The proportion of a species (or species group's) habitat that is affected by motorized routes.

Methodology: GIS analysis of added routes in relation to habitat and important/sensitive terrestrial biota areas.

Rationale: Literature indicates that placement of routes in relation to habitat can affect terrestrial species by increasing human-caused mortality, changing behavior due to disturbance and modifying habitat (Gaines et al. 2003, Trombulek and Frissell 2000, USDA-FS 2000).

3. Changes to the existing NFTS (changing season of use and year round prohibitions).

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: Ten analysis units, wilderness excluded because motorized use is not allowed.

Indicator(s): (1) Density of motorized routes; (2) Miles of motorized routes; (3) Number of sensitive sites for TES species (e.g., PACs, nest sites, winter roost areas) within ¼ mile of an added route or area; (4) The proportion of a species (or species group's) habitat that is affected by motorized routes.

Methodology: GIS analysis of changing routes in relation to habitat and important/sensitive terrestrial biota areas.

Rationale: Literature indicates that placement of routes in relation to habitat can affect terrestrial species by increasing human-caused mortality, changing behavior due to disturbance and modifying habitat (Gaines et al. 2003, Trombulek and Frissell 2000, USDA-FS 2000).

4. Cumulative Effects

Short-term timeframe: not applicable; cumulative effects analysis will be done only for the long-term time frame.

Long-term timeframe: 20 years.

Spatial boundary: Sierra National Forest.

Indicator(s): (1) Density of motorized routes; (2) Miles of motorized routes; (3) Number of sensitive sites for TES species (e.g., PACs, nest sites, winter roost areas) within ¼ mile of an added route or area; (4) The proportion of a species (or species group's) habitat that is affected by motorized routes. (see Aquatic Biota section for discussion of fish, amphibian and reptile species).

Methodology: GIS analysis of past/current, added and future routes/areas in relation to habitat and important/sensitive terrestrial areas and in context of other past/current and future management actions affecting terrestrial habitat.

Rationale: Literature indicates that placement of routes in relation to habitat can affect terrestrial species by increasing human-caused mortality, changing behavior due to disturbance and modifying habitat (Gaines et al. 2003, Trombulek and Frissell 2000, USDA-FS 2000).

Affected Environment and Environmental Consequences

First, the affected environment will be discussed for wildlife groups and species, followed by the environmental consequences for wildlife groups and species. Each group will be analyzed for the

effects of each alternative against the indicators. Any species specific effects will also be discussed.

Affected Environment – General Wildlife

On the SNF the following habitat types exist in the project area: oak woodland, Ponderosa pine, incense cedar, Sierra mixed conifer, white fir, red fir and finally juniper at the higher elevations. There is suitable seasonal or year round habitat for about 346 vertebrate species including 31 species of fish, 13 species of amphibians, 22 reptiles (see Aquatics Biota section for fish, amphibians and reptile analysis), 198 birds and 82 mammals. There are currently four species listed as Endangered or Threatened under the Endangered Species Act (ESA) and thirteen species listed as Forest Service Sensitive. These species and their habitats on the SNF are described in detail in the SNF Motorized Travel Management EIS Biological Evaluation/Biological Assessment (BE/BA) (incorporated by reference) (Sorini-Wilson, 2009). In addition there are 12 Management Indicator Species (MIS) habitat or ecosystem components. Only eight will be discussed in this section because wet meadow and riverine and lacustrine are covered under the aquatics section. Sagebrush is not identified for this forest and snags in burned forest are not affected by this project. These eight habitats and species associated with them are described in detail in the SNF Motorized Travel Management DEIS MIS Report (Strand and Sanchez 2009) (also incorporated by reference).

USFWS Endangered Species

Fresno kangaroo rat	*Dipodomys nitratoides exilis*
Sierra Nevada bighorn sheep	*Ovis candadensis californiana*
California condor	*Gymnogyps californianus*

The endangered species listed above have been identified by the USFWS as within Fresno, Madera or Mariposa county but are not within the project area, therefore, they will not be addressed further in this document. Unless otherwise noted, no further consultation on these species pursuant to the Endangered Species Act of 1973 is required with the Fish and Wildlife Service for these particular activities, unless new information reveals effects of the proposed action not considered here.

USFWS Threatened Species

Valley elderberry longhorn beetle	*Desmocerus californicus dimporphus*

There is habitat for the Valley elderberry longhorn beetle within the project area. Therefore, the project will follow the Project Design Criteria for Valley elderberry longhorn beetle as outlined in the "Route Designation Project Design Criteria for 'No effect' or 'May affect Not Likely to Adversely Affect' determinations" (October 2006). The U.S. Fish and Wildlife Service concurred as long as the design criteria are followed (see project record).

Forest Service Sensitive Species

The following 13 species are within the project area and are discussed (along with habitat requirements and effects) in this document. The 1998 Forest Service Sensitive Species has been updated six times since 1998.

Bald eagle	*Haliaeetus leucocephalus*
Peregrine falcon	*Falco peregrinus anatum*
California spotted owl	*Strix occidentalis occidentalis*

American marten	*Martes americana*
Pacific fisher	*Martes pennanti pacifica*
Wolverine	*Gulo gulo luteus*
Sierra Nevada red fox	*Vulpes vulpes necator*
Northern goshawk	*Accipter gentiles*
Great gray owl	*Strix nebulosa*
Willow flycatcher	*Empidonax traillii*
Western red bat	*Lasiurus blossevillii*
Pallid bat	*Antrozous pallidus*
Townsend's big-eared bat	*Corynorhinus townsendii*

There will be no direct or indirect effects to wolverine or Sierra Nevada red fox because their habitat is not being impacted with this project; therefore, these species will not be addressed further in this document. The Sierra Nevada red fox uses dense vegetation and rocky areas which pertain to a portion of the wilderness. There are no routes in the wilderness; therefore, the habitat is not being impacted.

Wolverine habitat as described by Zeiner et al 1990, is areas of low human disturbance such as caves, hollows in cliffs, logs, rock outcrops and burrows for cover. They den in similar habitat. There are no routes in this type of habitat; therefore, the habitat is not being impacted.

Forest Service Management Indicator Species

The following ten habitat types, along with the associated management indicator species, are within the project area and are discussed (along with habitat impacts) in this document (8 in this section and 2 in aquatic section). The Forest Service Management Indicator Species (MIS) list (2007) for the SNF is a representation of habitat and species associated with those habitats. The MIS species are listed in Table 163.

Affected Environment Related to Current Motorized Use

Some of the threatened, endangered and sensitive species and habitat for MIS are currently being affected by cross-country motorized use of the SNF. Literature describing the effects of motorized roads and trails upon wildlife have often grouped or categorized species in various ways to describe effects (Knight and Gutzwiller, ed. 1995, Gaines et al. 2003, Wisdom et al 2000). Gaines et al. (2003) categorized species into the following six groups (Table 163) based upon a combination of their biology and interactions with road- and motorized trail-associated factors: (1) old forest associated (or late-successional forest associated) species; (2) wide-ranging carnivores; (3) ungulates; (4) riparian-associated species; and (5) cavity dependent species. An additional category, (6) oak-woodland and oak-conifer associated will be addressed under the ungulate category because deer use this type of habitat and it is also addressed in the MIS report.

Table 164. Road and Trail Associated Factors with Disturbance and Activity Type and Affected Wildlife Group

Road and Trail – Associated factors[1]	Activity Type[2]	Definition of Associated Factors	Wildlife Group Affected
Collisions	Harvest	Mortality or injury resulting from a motor vehicle running over or colliding with an animal	• Wide-ranging carnivores • Late successional species • Aquatic-Riparian species • Ungulates
Habitat loss and fragmentation	Habitat modification	Loss and resulting fragmentation of habitat due to the establishment of roads, trails or networks and associated human activities	• Wide-ranging carnivores • Late successional species • Aquatic-Riparian species • Ungulates
Edge effects	Habitat modification	Changes to habitat microclimate associated with the edge induced by roads or trails	• Late successional
Snag or downed log reduction	Habitat modification	Reduction in density of snags and down logs due to their removal near roads as facilitated by road access	• Wide-ranging carnivores • Late successional species • Snag dependent species
Route for competitors and predators	Habitat modification	A physical human-induced change in the environment that provides access for competitors or predators that would not have existed otherwise	• Wide-ranging carnivores • Late successional • Aquatic -Riparian species
Disturbance at a specific site	Disturbance	Displacement of individual animals from a specific location that is being used for reproduction and rearing of young	• Wide-ranging carnivores • Late successional • Aquatic-Riparian associated • Ungulates • Oak-associated • Snag-dependent species
Physiological response	Disturbance	Increase in heart rate or stress hormones when near a road or trail or network of roads or trails	• Ungulates • Late successional • Aquatic-Riparian associated • Wide-ranging species • Oak-Associated • Snag-dependent

[1] Based in part on Wisdom et al. 2000 in: Gaines et al. 2003

[2] Disturbance occurs when an animal sees, hears, smells or otherwise perceives the presence of a human but no contact is made and it may or may not alter its behavior. Habitat modification is when habitat is changed in some way. Harvest involves human actions in which there is direct and damaging contact with the animal.

Table 165 displays the wildlife groups and the associated species representatives that will be discussed in the EIS. Some are not the same as ones listed in Table 163. They differ because they may not have TES or MIS status however they represent the wildlife group listed.

Table 165. Wildlife Group and Species Represented Within Groups

Wildlife Group	Species[1]
Late-successional forest associated species	California spotted owl, northern goshawk, great gray owl, American marten, Pacific fisher, blue grouse*
Ungulates	Mule deer
Riparian-associated species	Bald eagle, great gray owl, willow flycatcher, Western red bat
Cavity-dependent species	Pallid bat, hairy woodpecker*
Oak-woodland and oak-conifer associated species	Pallid bat, mule deer

1. Some of the species that are listed in the wildlife group will be addressed in the MIS section of this chapter, under the applicable MIS habitat or ecosystem component. Further detail is available in the MIS Report (Strand and Sanchez 2009), which can be found in the project record.

Zone Of Influence

The zone of influence (ZOI) for the species discussed in this analysis is ¼ mile on either side of center line (1/2 mile corridor) around existing and proposed additions to the NFTS. The effects to wildlife extend beyond the immediate road prism itself, into what can be referred to as a zone of influence adjacent to motorized roads/trails/areas (facilities). Motorized facilities have a zone of influence within which habitat effectiveness or suitability is reduced and wildlife population densities are lower (Trombulak and Frissell 2000, Gaines, et al. 2003). The degree of effect of the various factors associated with roads and trails can be evaluated more effectively when considering the proportion of a given species habitat that occurs within this zone of influence (as applied using GIS analysis). The zone of influence is a relative index of habitat effectiveness used to compare alternatives (see Indicator #4).

The ¼ mile ZOI should cover a large enough area to encompass habitat taken out of effective use in high motorized use areas where disturbance to wildlife has the potential to be the greatest. Beyond the ¼ mile ZOI, it is likely that there would be enough vegetative screening to decrease an animal's sensitivity to disturbance, thereby permitting the animal to effectively use habitat beyond that point.

AFFECTED ENVIRONMENT – BY TERRESTRIAL BIOTA INDICATOR

Table 166 below shows the existing condition and proposed changes for the Travel Management DEIS. The comparison between alternatives and direct and indirect effects are based on these numbers.

The SNF Motorized Travel Management (MTM) Project proposes to: (1) prohibit cross-country motorized travel except in managed use areas that are designated open to all vehicular use; (2) change the seasonal open period on some of the existing National Forest Transportation System (NFTS) routes (753, 1404, 1404, and 1551 miles for Alternatives 2 ,3, 4 and 5 respectively); (3) change vehicle class on some of the existing NFTS routes, thereby converting some roads to motorized trails (91, 129, 129 and 157 miles, respectively); and (4) add some unauthorized routes to the NFTS (see Table 166 for respective mileages). Table 166 reflects differences in motorized use that would occur under each alternative. (It is assumed that changing vehicle class on NFTS routes (thereby changing roads to motorized trails) would not change impacts upon wildlife. Therefore, these changes are not analyzed in this report and are not reflected in Table 166 or any

of the other tables). Table 167, below, shows the percent gain in terrestrial wildlife habitat effectiveness (or available habitat) that would result from implementation of each alternative. (Note: The analysis of aquatic wildlife habitats required a different approach. Therefore the Lacustrine/Riverine and Meadow Habitats are not included in Table 167.)

Table 166. Differences between Alternatives in Allowable Motorized Use within the Analysis Area

(1)	Acres Open to motorized Cross-country Travel	Number and Acres of unauthorized Use Areas that can receive motorized use under allowable cross-country travel	Number and Acres of FS Managed Use Areas	Miles of unauthorized Routes that can receive motorized use under allowable cross-country travel	Miles of Existing Roads and (miles of added NFTS routes included in total above) (2)	Miles of NFTS Routes with Seasonal Closures (3)	Miles of NFTS Routes Closed to Vehicles Year-Round	Miles and Density of All Routes in Analysis Area (4)	
								Miles	Density
Alt.1	660,000	2900 consisting of 965 acres	59 consisting of 125 acres open to OHV	552	2,972 (+0)	472	311	3,522	2.82
Alt.2	0	0	60 consisting of 131 acres open to OHV use	0	3,018 (+46)	1,014	204	3,568	2.86
Alt.3	0	0	59 consisting of 125 acres open to OHV	0	2,972 (+0)	472	311	3,522	2.82
Alt.4	0	0	70 consisting of 163 acres open to OHV use	0	3,023 (+51)	1,530	268	3,573	2.86

(1)	Acres Open to motorized Cross-country Travel	Number and Acres of unauthorized Use Areas that can receive motorized use under allowable cross-country travel	Number and Acres of FS Managed Use Areas	Miles of unauthorized Routes that can receive motorized use under allowable cross-country travel	Miles of Existing Roads and (miles of added NFTS routes included in total above) (2)	Miles of NFTS Routes with Seasonal Closures (3)	Miles of NFTS Routes Closed to Vehicles Year-Round	Miles and Density of All Routes in Analysis Area (4)	
								Miles	Density
Alt.5	0	0	79 consisting of 238 acres open to OHV use	0	3,057 (+85)	1,600	155	3,607	2.89

FS =Forest Service; NFTS =National Forest Transportation System; OHV = Off-highway Vehicle

(1) Alt.1 numbers reflect all existing authorized (NFTS) and unauthorized routes and use areas, except for those in displayed in Figure 1. The remaining alternatives reflect modifications to the existing authorized NFTS routes and use areas and do not include unauthorized routes and use areas since their use would be prohibited with prohibition of cross-country travel.

(2) "Miles of Existing Roads" includes: (1)existing roads and motorized trails in the SNF transportation system (NFTS); (2) existing private roads maintained by residents, Southern California Edison (SCE) or Pacific Gas and Electric (PG&E); (3) existing roads maintained by County, State, National Parks, Bureau of Land Management and other Federal Agencies; and (4) For Alts 2, 4, and 5 roads and motorized trails added to the NFTS.

(3) For Alt.1, the "Miles of NFTS Routes with Seasonal Closures" reflect existing conditions. For Alts 2-5, the "Miles of NFTS Routes with Seasonal Closures" reflect changes to existing seasonal closures, new seasonal closures and seasonal closures dropped or changed to year round closures. It is the total miles of roads that would be seasonally closed under each alternative.

(4) The mileage and density calculations provided in the last column include: (1) roads and motorized trails in the SNF transportation system; (2) private roads maintained by residents, Southern California Edison (SCE) or Pacific Gas and Electric (PG&E); (3) roads maintained by County, State, National Parks, Bureau of Land Management and other Federal Agencies; and (4) FOR ALT.1 ONLY, unauthorized routes that will continue to receive use under allowable motorized cross-country travel.

Table 167. Percent Gain in Terrestrial Wildlife Habitat Effectiveness (or Available Habitat*) Per Alternative

	Shrubland Habitat	Montane Hardwood Habitat	Riparian Habitat	Early Seral Coniferous Forest Habitat	Mid Seral Coniferous Forest Habitat	Late Seral Open Canopy Coniferous Forest Habitat	Late Seral Closed Canopy Coniferous Forest Habitat	Green Forest Snag Habitat*
Alt.1	1	2	0	0	4	4	2	0 (but 1% gain in effective MIS use)
Alt.2	39	46	23	46	45	34	45	5 ([1])
Alt.3	21	26	8	33	31	17	28	0 ([1])
Alt.4	30	38	24	44	42	31	39	4([1])
Alt.5	25	31	20	31	32	19	30	1([1])

[1] Under alternatives 2, 3, 4, and 5, none of the habitat would have a decrease in effective MIS use. There would be a 100 percent gain in effective MIS use of the habitat.

**Calculations for Alternative 1 include existing unauthorized routes because use of these routes can be assumed to continue as part of continued cross-country travel.

Environmental Consequences – General

Direct and indirect effects focus on the unauthorized routes which will receive public motorized use in the alternatives. For the no action alternative, this includes all existing unauthorized routes, which will likely continue to receive public motorized use under continued cross-country travel. For the action alternatives, it includes only those unauthorized routes added to the NFTS in that alternative. Effects related to proposed changes to the current NFTS are addressed under each alternative for each species or habitat component.

Table 168 lists the mitigation measures that will be implemented with each alternative. The determinations for threatened, endangered and Forest Service sensitive species are made based on these being implemented.

Table 168. Mitigation Measures for Terrestrial Biota

Code	Title	Mitigation Measure
WL-1	Noise disturbance to territorial or nesting goshawks.	Seasonal closure from Feb 15-Sept 15. Consult with district biologist to determine if nesting is occurring or surveys need to be conducted.
WL-2	Noise disturbance to territorial or nesting California spotted owl	Seasonal closure from Mar 1- Aug. 15. Consult with district biologist to determine if nesting is occurring or surveys need to be conducted.
WL-3	Noise disturbance to territorial or nesting Great Gray owls	Seasonal closure from Mar 1- Aug. 15. Consult with district biologist to determine if nesting is occurring or surveys need to be conducted.
WL-4	Noise disturbance to deer in holding areas	Seasonal closures for: -Deer holding areas above 5,000 feet elevation – May 15 to June 15 and October 1 through November 30. -Deer holding areas below 5,000 feet elevation – May 1 to June 1 and October 15 to November 30.
WL-5	Noise disturbance to deer in winter ranges	Seasonal closures in deer winter range from December 1 through April 30

Road and Unauthorized Route Density

The table below shows the road density (including unauthorized routes in Alternative 1) (mi/sq. mi.) by alternative within the analysis area. The density includes all jurisdictions on forest (BLM, County, Forest Service, Private, State and SCE). The difference between Tables 169 and 170 is all the analysis area does not necessarily fall into a MIS vegetation type.

Table 169. Road Density by Alternatives Including all Jurisdictions in the Project Area

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
2.82 mi/sq. mi.	2.86 mi/sq. mi.	2.82 mi/sq. mi.	2.86 mi/sq. mi.	2.89 mi/sq. mi.

Table below shows the road density within MIS vegetation type separated by motorized routes and unauthorized routes.

Table 170. Road and Unauthorized Route Density within MIS Vegetation Type

Vegetation Type	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Shrubland Motorized Routes	2.39 mi/sq. mi.	2.04 mi/sq. mi.	2.04 mi/sq. mi.	2.06 mi/sq. mi.	2.08 mi/sq. mi.
Oak-associated Hardwood and Hardwood/conifer Motorized Routes	2.16 mi/sq. mi.	1.84 mi/sq. mi.	1.81 mi/sq. mi.	1.83 mi/sq. mi.	1.87 mi/sq. mi.
Riparian Motorized Routes	3.78 mi/sq. mi.	3.66 mi/sq. mi.	3.66 mi/sq. mi.	3.66 mi/sq. mi.	3.66 mi/sq. mi.
Early Seral Coniferous Motorized Routes	4.60 mi/sq. mi.	3.95 mi/sq. mi.	3.83 mi/sq. mi.	3.94 mi/sq. mi.	4.00 mi/sq. mi.
Mid Seral Coniferous Motorized Routes	3.09 mi/sq. mi.	2.73 mi/sq. mi.	2.69 mi/sq. mi.	2.74 mi/sq. mi.	2.76 mi/sq. mi.
Late Seral Open Canopy Coniferous Motorized Routes	2.50 mi/sq. mi.i	2.33 mi/sq. mi.	2.33 mi/sq. mi.	2.33 mi/sq. mi.	2.33 mi/sq. mi.
Late Seral Closed Canopy Coniferous Motorized Routes	2.70 mi/sq. mi.	2.40 mi/sq. mi.	2.38 mi/sq. mi.	2.40 mi/sq. mi.	2.43 mi/sq. mi.

Calculations for Alternative 1 include existing unauthorized routes because use of these routes can be assumed to continue as part of continued cross-country travel.

Direct and Indirect Effects – General for Terrestrial Biota

In recent years, the increasing demand for motorized recreational opportunities on National Forest System lands has lead to controversy over the potential effects of this use on wildlife. Several scientific papers and literature reviews have been written on the interaction between the motorized roads and trails on terrestrial and aquatic wildlife species. The majority of the literature and reviews describe the interactions between wildlife and roads rather than wildlife and trails. Most of the research has focused on wide-ranging carnivores and ungulates (mule deer). Most commonly, interactions included displacement and avoidance where animals were reported as altering their use patterns in response to roads. Disturbance at specific sites are also commonly reported, such as disruption at breeding or wintering sites. Collision with vehicles is another common report. Edge effects and habitat fragmentation, especially in regard to late-successional forests is another commonly identified impact of roads. The broad general impacts of wheeled motorized roads and trails to wildlife species are summarized here (Trombulak and Frissell 2000). Details and research citations are available in Terrestrial BE/BA (Sorini-Wilson 2009).

- Increased terrestrial species mortality from collision with vehicles
- Modification of animal behavior
- Alteration of the terrestrial habitat
- Increased alteration and use of habitats by humans

MORTALITY FROM COLLISION WITH VEHICLES

Animal mortality or injury from collision with vehicles is well documented in the literature. Trombulak and Frissell (2000) reported animal mortality from vehicle collisions included a wide array of wildlife including deer, wolves, bear, hawks, owls, songbirds, snakes, lizards and amphibians. Road associated mortally generally increases as traffic volume and speed increases.

For large mammals, unpaved forest roads pose less of a concern for mortality or injury from vehicle related collisions. Raptors may also be vulnerable to collisions from forest roads and trails because of their foraging behavior (Loos and Kerlinger 1993); however, the most reports of raptor mortality are in association with paved roads and highways.

Direct Effects

Road and trail corridors may act as habitat sinks for wildlife that are attracted to corridors (Jalkotzy et al. 1997). Direct mortality of animals from vehicle collisions has been documented primarily in relation to paved roads and highways. Little scientific information is available about vehicle collisions on Forest roads or motorized trails, though some mortality from use of forest roads and motorized trails is to be expected depending on the type of trail and the amount of use a trail receives.

MODIFICATION OF ANIMAL BEHAVIOR

A road or trail may modify the behavior of animals positively or negatively. Behavior modifications include changes or shifts in home range, changes in movement patterns, loss of reproductive success, flight or escape response and changes in physiological condition. Some wildlife species are more sensitive to well-traveled roads as opposed to motorized roads and trails that are only used by high clearance four-wheel drive, motorcycle and all-terrain vehicles (ATVs). Other wildlife are more sensitive to the latter. In general, all roads and trails, depending on the type of vehicle and the amount of use, have some type of positive or negative impact on wildlife.

The most common interaction identified in literature between motorized roads and trails and wildlife species was displacement and avoidance, which altered habitat use (Kasworm and Manley 1990, Mace et al. 1996 *In:* Gaines et al. 2003). Wildlife often avoid habitats in the vicinity of roads because of repeated disturbances along the corridor (Jalkotzy, et al. 1997). Studies indicated both black bears and grizzly bears shifted their home ranges away from areas of high road density to areas of lower road densities (Brody and Pelton 1989, McLellan and Shackelton 1988). Road avoidance may vary seasonally. Both grizzly and black bears tended to avoid roads less in the spring than in the fall. Elk also avoided roads less in the spring and more in the fall.

Roads may affect the reproductive success of some species. Bald eagles in Oregon and Illinois showed declines in nesting productivity with the closer proximity to roads. Bald eagle nests were preferentially selected away from roads (Trombulak and Frissell 2000).

Havlick (2002) documented numerous studies that show wildlife, including birds, reptiles and large ungulates, respond to disturbance with accelerated heart rate and metabolic function and suffer from increased levels of stress. These factors can lead to displacement, mortality and reproductive failure. Wildlife was also reported to avoid areas with high levels of disturbance.

The impacts of motorized wheeled vehicles to terrestrial wildlife can include disturbance from noise generated by motor vehicles. Determining the effects of noise on wildlife is complicated because responses vary between species. The variation in responses is based upon the type of noise and its duration, frequency, magnitude and location and the species life history characteristics, habitat type, season, activity at time of exposure and whether other environmental stresses are occurring coincident to exposure of noise (Busnel 1978 *In*: Radle 2002, Steidl and Powell 2006). Effects of noise can cause physiological responses in wildlife including increased heart rate and altered metabolism and hormone balance. Behavioral responses can include head raising, body shifting, short distance movements, flapping of wings (birds) and escape behavior. Together, these effects potentially can lead to bodily injury, energy loss, decrease in food intake,

habitat avoidance and abandonment and reproductive loss. The vast majority of studies conducted on wildlife effects from road and trail-associated noise have been done for bird species.

Many studies have reported interactions between roads and ungulates, particularly elk and deer. Some of the studies are contradictory. Rost and Bailey (1979) reported that elk and mule deer avoided roads within a 656 foot (200 meter) distance. While other studies (Noss 2000 and Knight and Gutzwiller 1995) reported 1300 to 3000 feet is the distance at which deer and elk are impacted by roads (Further details in Strand and Sanchez 2009). Thomas et al. (1979) indicated that roads open to vehicular traffic will adversely affect the use of an area by elk and, to a lesser extent, by deer.

Forest roads and trails change the biological and physical conditions on and adjacent to them, creating edge effects with influences beyond the extent of the road prism (Trombulak and Frissell 2000). Trombulak and Frisell (2000) describe eight physical characteristics that are altered by roads: soil density, temperature, soil water content, light, dust, surface-water flow, pattern of run-off and sedimentation.

Long term use of roads causes soil compaction that lasts long after road use is discontinued. Increases in soil density on decommissioned roads can persist for decades.

Some Potential Effects of Habitat Alteration to Terrestrial Wildlife Habitats

Forest roads and trails can both enhance and decrease habitat for wildlife (Jalkotzy et al. 1997). The road or trail creates edge habitat for species that are habitat generalists, particularly for some mammal species (e.g., coyote and deer mice) and some songbird species. Ravens are more common along roads since carrion is more available along these corridors. For habitat specialists, such as interior dwelling species that require intact, undisturbed patches of habitat such as the American marten and the spotted owl, roads can fragment habitat. Roads and trails can also fragment or disrupt habitat indirectly by introducing exotic or noxious weeds. In addition roads can increase pollutants like dust and vehicle emissions that can contaminate roadside vegetation upon which wildlife feed.

INCREASED ALTERATION AND USE OF HABITATS BY HUMANS

Several studies have indicated that high road densities result in adverse impacts on certain wildlife species. Impacts from high road densities include increased harvest including allowed and prohibited, disturbance/harassment from noise and habitat alteration. Brocke et al. (1988) reported that high road densities can elicit a variety of negative impacts on certain wildlife species. These effects include human disturbance. In Adirondack counties, the black bear population density index showed a ten-fold decrease when road density increased by ten times. Other studies were cited as showing similar sensitivity to road density for other large predators and ungulates.

The science available to describe the interactions between focal wildlife species and roads is more developed than that available to describe the interactions between focal wildlife species and recreation trails. Much of the research has been focused on wide-ranging carnivores and ungulates. Other lesser known species could benefit from additional research on the effects of roads; this is especially true for less mobile species where roads may inhibit movements or fragment habitats.

Disturbance at a specific site was also commonly reported and included disruption of animal nesting, breeding or wintering areas (Linnell et al. 2000, Papouchis et al. 2001, Skagen et al. 1991). Collisions between animals and vehicles were commonly reported and affected a diversity of wildlife species, from large mammals (Gibeau and Heuer 1996, Lehnert et al. 1996) to amphibians (Ashley and Robinson 1996). Finally, edge effects associated with roads or road

networks constructed within habitats, especially late-successional forests, were commonly identified (Hickman 1990, Miller et al. 1998).

Late-successional forest associated species: Affected Environment

This species group is associated with mature-to-old forests that contain characteristics of late-successional stages. These characteristics include large trees for a given growing site, relatively high canopy closure and elevated amounts of decadence in the form of snags, down logs, in-tree decay and deformity.

Late-Successional Forest Associated Species: Environmental Consequences

Table 171 summarizes the differences that would occur within late seral open and closed canopy habitat under each alternative. Motor vehicle use areas that are within the habitat and routes that are within ¼ mile of the habitat likely increase: (1) nesting, resting and foraging disturbance; and/or (2) habitat avoidance. Those impacts are most significant during the reproductive seasons and likely reduce reproductive success. Reproductive seasons span from the around the beginning of March-to-mid August. The period of greatest sensitivity for birds occurs during nest building and incubation (Gotmark 1992 in Knight and Gutzwiller 1995) when the individual is more likely to abandon the site. During nestling/fledgling periods, parental attentiveness may be disturbed; thereby, disrupting feeding patterns and increasing the chance that young may become stressed and/or predated upon.

Table 171. Indicators per Alternative for Late Seral Closed and Open Canopy Coniferous Forest Habitat

	Acres Open to Motorized Cross-country Travel	Miles of Roads/ Motorized Trails (NFTS, other public, private)	Road Density (mi./sq. mi.)	Acres of Managed Use Areas	Acres and Percent Habitat Influenced by Motorized Routes and Use Areas	% Gain in Habitat Effectiveness
Closed Canopy Coniferous Forest Habitat						
Alt.1	58,731 (including 34 miles of unauthorized routes and 15 acres of unauthorized use areas outside of NFS lands displayed in Figure 1)	247	2.70 (1)	1	55,681 = 84% (2)	2%
Alt.2	0	250	2.40	1	26,898 = 41%	45%
Alt.3	0	247	2.38	1	38,743 = 58%	28%
Alt.4	0	250	2.40	1	31,136 = 47%	39%
Alt.5	0	253	2.43	2	37,109 = 56%	30%
Open Canopy Coniferous Forest Habitat						
Alt.1	1,652 (including 0.5 miles of unauthorized routes and 0.3 acres of unauthorized use areas outside of NFS lands displayed in Figure 1)	7	2.50 (1)	0	1,393 = 66% (2)	4%
Alt.2	0	7	2.33	0	758 = 36%	34%
Alt.3	0	7	2.33	0	1,109 = 53%	17%
Alt.4	0	7	2.33	0	809 = 39%	31%
Alt.5	0	7	2.33	0	1,060 = 51%	19%

1. Includes unauthorized routes that could have use with authorized cross-country travel
2. Includes unauthorized routes and use areas that could have use with authorized cross-country travel

California spotted owl – Affected Environment

The California spotted owl is designated by the Regional Forester as a sensitive species and is selected as a Management Indicator Species on the SNF. The SNF has 234 designated California spotted owl Protected Activity Centers (PACs) and 228 Home Range Core Areas (HRCAs). Protected Activity Centers are delineated around spotted owl territorial pairs or territorial individuals and are compromised of the best available habitat encompassing 300 acres. The Sierra Nevada Forest Plan Amendment (USDA-FS 2004a) provides direction to designate PACs and HRCAs compromised of the best habitat using CWHR types 6, 5D, 5M, 4D and 4M. These CWHR types are in essence considered suitable habitat (nesting and foraging) for California spotted owls. Pure eastside pine types are not considered suitable for California spotted owls. Currently, there are 65,950 acres suitable spotted owl habitat with CWHR types 6, 5D, 5M, 4D and 4M within the analysis area.

The SNF has conducted surveys for spotted owl presence and reproductive status across the forest since the early 1980s. Approximately 200,000 acres of suitable habitat , which includes 3D and 3M habitat types, has been surveyed on the SNF following Pacific Southwest Region, USDA Forest Service Protocol.

California spotted owl – Environmental Consequences

The following indicators were chosen to provide a relative measure of the direct and indirect effects to the owl. Although thresholds for these indicators have not been established, they provide general measures by which the effects of the project alternatives may be compared.

- Miles of routes added to the NFTS within PACs.
- Number of PACs intersected by routes added to the NFTS or maintenance level 1 (ML1) roads converted to trails (Percentage of all PACs in Project Area).
- Miles of routes added to the NFTS within ¼ mile of PACs.
- Number of PACs occurring within ¼ mile of routes added to NFTS or ML1 roads converted to trails.
- Percentage of spotted owl PACs (total acres) occurring within ¼ mile ‘zone of influence’ (ZOI); of routes added to the NFTS or ML1 roads converted to trails.

Disturbance: California spotted owls could be disturbed during the nesting season by cross-country travel. Disturbance could lead to reduced time on the nest, thereby threatening eggs or young, with exposure. Disturbance from off-road travel would typically occur in daylight when owls are in the resting portion of the diurnal cycle. Off-road disturbance impacts are limited by the heavily timbered areas where spotted owls nest. In general, these impacts are possible but not likely. The minor possibility of off-road disturbance impacts would have no measurable impact on long-term population parameters; therefore, the effect on northern spotted owls of continued cross-country travel is negligible and discountable (same assumption for California spotted owl). Great gray owls would be impacted by similar effects as northern and California spotted owls of disturbance to nesting birds.

Studies reviewed by Gaines et al. (2003) indicated that northern spotted owls were likely to be affected by the following road and motorized trail-associated factors: Collisions, disturbance at a specific site, physiological response, edge effects and snag reduction. These same factors, as well as “habitat loss and fragmentation” are expected to affect California spotted owls based upon review of the available literature (Verner et al. 1992, Blakesley 2003, Seamans 2005).

Habitat loss, fragmentation and edge effects: Studies have shown California spotted owls to be sensitive to changes in canopy closure and habitat fragmentation (Seamans 2005, Blakesley 2003, North et al. 2000), which could result from road networks. Roads and motorized trails can result in a decrease in interior forest patch size, decreasing the amount of habitat increasing the distance between suitable interior forest patches for old forest species like the California spotted owl. As migration between suitable habitat patches becomes more difficult, suitable habitats are less likely to remain occupied over time (Reed et al. 1996, Zabel et al. 1992). Trails, with their narrower width, result in little or no reduction in forest canopy and would therefore be unlikely to result in a negative edge effects or habitat fragmentation as compared to roads.

Short term responses in birds as stated by Bowles *in* Knight and Gutzwiller (1995), they have a similar continuum of responses, at the mildest level, they alert. Next, they exhibit mild aversion by flipping their wings (intention movements to fly), pecking at each other and walking, swimming or flying short distances. More intense aversion triggers longer movements, crouching on the nest, attacks on conspecifics or on the source of the disturbance (raptors, terns) and long interruptions of normal behavior. In the extreme case, individuals or flocks respond with panic flight or running.

Alternative 1 – No Action

Effects due to Continued Cross-country Travel: Cross-country travel would not be prohibited under this alternative. Therefore, it is assumed the route proliferation would continue over the short and long-term and the effects would be similar to those discussed under adding routes to the NFTS. There would be the continued use of 550 miles of routes and 25 acres of use areas would continue under this alternative.

Effects Due to Additions to the NFTS: There are no routes or use areas identified to add to the NFTS under this alternative.

Effects Due to Changes to the Existing NFTS: Under this alternative, there are no proposed changes to the current season of use NFTS road plan. Closure conditions would not change, therefore, there would be no changes to potential direct and indirect effects to the California spotted owl.

Alternative 2 – Proposed Action

Effects due to the Prohibition of Cross-country Travel: Cross-country travel would be permanently prohibited across the SNF under this alternative. Prohibition of cross-country travel would limit motor vehicle use to current NFTS roads. Technically, it would limit the proliferation of illegally created routes near spotted owl activity centers, PACs and suitable habitat. This would reduce the risk of direct and indirect effects to the spotted owl from motorized travel over the short and long term.

Effects Due to Additions to the NFTS: Under this alternative there are 46 miles of routes that would be additions to the NFTS and 6 acres of use areas. Of the 46 miles added, 11 miles are within three Spotted Owl PACs and eight HRCAs (<1 percent; 3 of 234 total PACs and 4 percent; 8 of 228 total HRCAs) (See Table 172 below). None of the routes are within ¼ mile of known nest sites. Since routes proposed within this alternative are native surface routes with slower rates of travel, they would not likely result in any human-caused mortality, but would likely increase disturbance to some roosting owls within the analysis area. Although actual disturbance effects will be largely influenced by site specific factors, it is assumed that all routes within a PAC may result in disturbance to roosting owls. Addition to NFTS may increase disturbance to owls depending on where they are located. As shown in Table 172, there is a slight increase in additions to the NFTS.

Table 172. California Spotted Owl Indicators – Alternative 2

Indicators	
Miles of routes added to the NFTS within PACs	11 miles
Number of PACs/HRCAs intersected by routes added to the NFTS.	3 PACs/8 HRCAs
Acres of routes added to the NFTS within ¼ mile of PACs	5,352 acres
Number of PACs occurring within ¼ mile of the ZOI added to NFTS	8
Percentage of spotted owl PACs (total acres) occurring within ¼ mile 'zone of influence' of routes added to the NFTS	3%

Effects Due to Changes to the NFTS: Changes to class of use are not expected to have any detectable impact on wildlife. The source of disturbance whether an auto, truck or motorized recreation vehicle, is assumed to provide the same magnitude of impact for this analysis.

Changes to the NFTS that have a positive effect on spotted owls are seasonal closures to NFTS roads within the zone of influence for each spotted owl PAC and associated habitat. In addition, some NFTS roads are proposed to be prohibited (closed year round); this will also have a positive effect on spotted owls because noise disturbance would not occur and potential harassment by vehicles passing by would not occur.

When there is a change of seasonal closure there are more restrictive timeframes. There are 107 miles fewer roads with year round closures but 542 miles of roads with seasonal closures. It is a benefit to wildlife because more habitat will have less disturbance. There would be fewer disturbances to nesting birds as discussed above.

Alternative 3

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be permanently prohibited in this alternative. Direct and indirect effects are the same as described in Alternative 2.

Effects Due to Additions to the NFTS: Under this alternative, there would be no new routes or use areas proposed for addition to the NFTS; therefore, there would be no direct or indirect effect to the spotted owl.

Effects Due to Changes to the NFTS: Under this alternative, there would be no changes to the seasons of use, the only ones implemented are those that currently exist. There would be no new direct or indirect effects to the spotted owl.

Alternative 4

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be permanently prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes near spotted owl activity centers and PACs. This would reduce the risk of direct and indirect effects to the spotted owl from motorized travel over the short and long term. The effects are the same as described in Alternative 2.

Effects Due to Additions to the NFTS: Under this alternative, there would be 51 miles of trails and roads as well as 37 acres (11 use areas) added to the system. Of that 51 miles approximately 7 miles that would be added to the NFTS that intersect with 13 Spotted Owl PACs/HRCAs. None of the added routes intersect with nest sites.

Effects Due to Changes to the NFTS: Under this alternative, the change to seasonal open period would be a benefit to spotted owls because the routes would be closed during the important breeding times which in turn would be less noise disturbance. There are 43 miles less of year round closure but 1058 miles of seasonal closures. The ZOI would be less because the routes would not be open during important incubation and nesting times.

Table 173. California Spotted Owl Indicators – Alternative 4

Indicators	
Miles of routes added to the NFTS within PACs	7.4 miles
Number of PACs/HRCAs intersected by routes added to the NFTS	5 PACs/8 HRCAs
Acres of routes added to the NFTS within ¼ mile of PACs	5,352 acres
Number of PACs occurring within ¼ mile added to NFTS (ZOI)	7
Percentage of spotted owl PACs (total acres) occurring within ¼ mile 'zone of influence; of routes added to the NFTS	3%

Alternative 5

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be permanently prohibited in this alternative. Direct and indirect effects are the same as described in Alternative 2.

Effects Due to Additions to the NFTS: There are 85 miles of trails added to the NFTS under this alternative. There would be greater noise disturbance to owls because there would be more vehicles accessing suitable habitat. Under this alternative it opens the most access to vehicles which in turn could cause more disturbances to owls.

It also allows the most use areas (113 acres (20 use areas)) across the SNF. These areas are used for staging prior to events or overnight use after an event. Spotted owls are nocturnal and it could disrupt their flight pattern for foraging; however, they may return to the area once vehicles have left.

Effects Due to Changes to the NFTS:

The changes that occur under this alternative would open routes of trails which have the potential to disrupt behavior patterns for the spotted owls. They could disperse from an area while noise disturbance occurs and return at a later time. Under this alternative the most changes occur which is opening more area for vehicles and this in turn opens more habitat which could affect the owls nesting or foraging behavior over time. There are 156 miles less year round closed but 1128 more seasonal closures under this alternative.

Table 174. California Spotted Owl Indicators – Alternative 5

Indicators	
Miles of routes added to the NFTS within PACs	12.6 miles
Number of PACs/HRCAs intersected by routes added to the NFTS	6 PACs/12 HRCAs
Acres of routes added to the NFTS within ¼ mile of PACs	5,352 acres
Number of PACs occurring within ¼ mile of ZOI of routes added to NFTS	19
Percentage of spotted owl PACs (total acres) occurring within ¼ mile 'zone of influence; of routes added to the NFTS	8%

Cumulative Effects

In the Notice of Finding on a petition to list the California spotted owl, the USFWS identified that loss of habitat to stand replacing fires and habitat modification for fuels reduction were the primary risk factors to California spotted owls occurring on NFS lands (USFWS 2006). Appendix E provides a list and description of past, present and reasonably foreseeable projects on the Forest and private lands within the SNF boundary. Some, but not all, of these activities will contribute to effects upon California spotted owls. The habitat for late successional species which includes spotted owl shows 8 percent change overall with 36 percent of the PACs being effected (84/234).

The effect of open motorized routes on spotted owl populations or habitats was not identified as a significant risk factor by either the Forest Service or the USFWS. However, given the proportion of spotted owl nest sites and habitat potentially affected and considering the projections for future increases in recreation uses and OHV activity, Alternative 1 may, over time, contribute to cumulative effects upon spotted owl populations. Because Alternative 1 does not restrict vehicles to designated routes, there is a high degree of uncertainty about future route proliferation in owl habitat which may have disturbance and habitat effects beyond the effects of routes open to motorized use. Alternative 1 presents the greatest risk of contributing to adverse cumulative effects upon spotted owl habitat and populations because there would not be a prohibition on cross-country travel. Alternative 3 contributes the least to cumulative effects because cross-country travel would be prohibited, open route densities in spotted owl habitat are lowest and no motorized routes would be designated. Alternatives 2, 4 and 5 would result in progressively lower risk to spotted owls due to the amount of motorized routes being added to the system. Considering the proportion of spotted owl habitat influenced by motorized routes and projections for future increase in recreation uses and OHV activity, the alternatives may result in minor cumulative impacts when combined with other factors affected spotted owl habitat. Although the action alternatives may result in cumulative impacts, they are very minor in comparison to existing road densities and other potentially significant impacts (fire, fuels/vegetation treatments).

Northern goshawk – Affected Environment

The northern goshawk is designated as a Forest Service Sensitive Species in the Pacific Southwest Region. There are currently 65,950 acres of suitable goshawk habitat on the SNF as defined by CWHR types 4 M, 4D, 5M, 5D. The SNF does not have CWHR 6. Northern goshawk territories are managed on the SNF as Protected Activity Centers (PACs) as prescribed by the SNFPA (USDA-FS 2004a). To date, the SNF has 55 known northern goshawk PACs and territories.

Northern goshawk – Environmental Consequences

Direct effects

Disturbance: Northern goshawks actively defend nest sites during portions of the breeding season. Cross-country travel could lead to direct effects by disturbance that disrupts pair-bonding, cause exposure of eggs or young to inclement weather and increases adult energy expenditures. Little published information exists regarding the sensitivity of northern goshawks to nest site disturbances from recreational activities.

The major threat to northern goshawks at the present time involves the effects of vegetation management (e.g. timber harvest, fuels treatments) and wildfire on the amount, distribution and quality of habitat (DeStefano 1998). Little published information exists regarding the sensitivity of northern goshawks to nest site disturbances from recreational activities.

Human disturbance has the potential to cause goshawks to abandon nesting during the nesting and post fledgling period (February 15 through September 15). Goshawks initiate breeding when the ground is still covered in snow and sometimes they locate their nests along roads and trails when they are not yet in use. Additionally, roads and trails provide flight access for goshawk. When the snow melts, these sites can potentially be areas of conflict as motorized recreation activities begin. Josline and Youmans (1999) recommend maintaining low road densities to minimize disturbance to goshawk. Grubb et al. (1998) reported that vehicle traffic on roads more than ¼ mile (0.25 miles) from nests did not elicit any discernable behavioral response from goshawks.

Habitat loss, fragmentation and edge effects: The major threat to northern goshawks at the present time, involves the effects of vegetation management (e.g. timber harvest, fuels treatments) and wildfire on the amount, distribution and quality of habitat (DeStefano 1998).

A network of roads and motorized routes can fragment goshawk habitat by reducing canopy closure (Beier and Drennan 1997, Daw and DeStefano 2001) and by reducing forest interior patch size. However, how habitat fragmentation from roads and trails affects goshawk habitat suitability is not well understood. Generally, the wider the road, the more it can fragment habitat. Native surface roads and routes probably do not pose as much risk of habitat fragmentation compared to smooth surfaced roads due to their narrow width relative to the natural tree spacing in late-seral forests.

Alternative 1 – No Action

Effects Due to Continued Cross-country Travel: Cross-country travel would not be prohibited under this alternative. Therefore, it is assumed the route proliferation would continue over the short and long-term and the effects would be similar to those discussed under adding routes to the NFTS. No routes intersect known goshawk nests. There are 550 miles routes and 125 acres of use areas.

Effects Due to Additions to the NFTS: There are no routes or use areas identified to add to the NFTS under this alternative.

Effects Due to Changes to the NFTS: Under this alternative, there are no proposed changes to the current season of use NFTS road plan. Closure conditions would not change; therefore, there would be no changes to potential direct and indirect effects to the Northern goshawk.

Alternative 2 – Proposed Action

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes near goshawk activity centers, territories and preferred habitat. This would

reduce the risk of direct and indirect effects to goshawks from motorized travel over the short and long-term.

Effects Due to Additions to the NFTS: The SNF has monitored nest sites in proximity to some roads and trails. There are 14 NFTS routes that will be added and intersect goshawk territories (175 ac) or PACs (200 ac) (See Table 175 below).

Proposed route KD-122 (Alts 2 and 5) has the most potential to disturb goshawks because the route runs adjacent to a historical nest site. The goshawks have not been there for at least three survey years (Sorini-Wilson, 2009). The routes that are listed in Table 175 intersect territories or PACS but **not** known nest sites.

Actual nest locations are often difficult to locate and may move around from year-to year within a PAC. Therefore, actual nest locations remain unknown for some of the PACs and those nests that have been located may have moved since it was last located.

Since routes proposed within this alternative are native surface routes with slower rates of travel, they would not likely result in any human-caused mortality, but would likely increase disturbance to some roosting goshawks within the project area. Although actual disturbance effects will be largely influenced by site specific factors, it is assumed that all routes within a PAC may result in disturbance to some goshawks. Therefore, this alternative would result in some level of disturbance within approximately 7 percent (4/55) of the goshawk PACs in the project area. As mentioned, it is assumed that activities greater than ¼ mile away have little potential to affect goshawks. Under this alternative, approximately 7 percent of goshawk PACs (percentage of total acres) would occur within the zone of influence or routes. Disturbance resulting from these actions is likely to result in increased flushing from roosts to perches, increased alarm responses and increased stress hormone levels in some individual goshawks.

Table 175. Routes Proposed to be Added to NFTS (Alts 2, 4 and 5) that Intersect Goshawk Territories or PACs

Analysis Unit	Alternative	Routes	Goshawk Territory or PAC
Westfall	2	PK-5	SIEGH47
Westfall	2,4,5	PK-4	SIEGH47
Westfall	2,5	SR-21z	SIEGH47
	2	SV-2	SIEGH47
Westfall	2,5	JSM107	SIEGH45
Westfall	2,5	SV-1	SIEGH47
	2,5	SV-1b	SIEGH47
Westfall	4,5	SV-1a	SIEGH47
Tamarack-Dinkey	2,4,5	JH-115	SIEGH6
Dinkey-Kings	2,5	KD-122	SIEGH6
Tamarack-Dinkey	2,5	PK-30z	SIEGH21
Tamarack-Dinkey	2,5	PK-31z	SIEGH21
Tamarack-Dinkey	2,5	PK-32x	SIEGH21
Tamarack-Dinkey	2,5	PK-33z	SIEGH21

Actions proposed in this alternative would result in some indirect effects through habitat modification. The addition of routes to the NFTS within and near PACs would result in minor amounts of habitat fragmentation. Since the majority of these routes are narrow native surfaced routes they would only result in minor reductions in overhead cover and would not significantly reduce goshawk movement between habitat patches.

Effects Due to Changes to the NFTS: Changes to the NFTS that have a positive effect on goshawk are seasonal closures to NFTS roads within the zone of influence for each goshawk PAC and associated habitat. In addition, some NFTS roads are proposed to be prohibited (closed year round); this will also have a positive effect on goshawks. There are 107 miles fewer year round closures but 542 more seasonal closures. The table below describes the differences for alternative 2 to the NFTS.

Table 176. Northern Goshawk Indicators – Alternative 2

Indicators	
Miles of routes added to the NFTS within PACs	2.4 miles
Number of PACs or territories intersected by routes added to the NFTS	4
Acres of routes added to the NFTS within ¼ mile of PACs - ZOI	1969 acres
Number of PACs occurring within ¼ mile of the ZOI of routes added to NFTS	4
Percentage of gohsawk PACs (total acres) occurring within ¼ mile of the 'zone of influence	7%

Alternative 3

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be permanently prohibited in this alternative. Direct and indirect effects are the same as described in Alternative 2.

Effects Due to Additions to the NFTS: Under this alternative, there would be no new routes or use areas proposed for addition to the NFTS; therefore, there would be no direct or indirect effect to the goshawks.

Effects Due to Changes to the NFTS: Under this alternative, there would be no changes to the seasons of use; the only ones implemented are those that currently exist. There would be no changes there would be no new direct or indirect effects to the goshawks.

Alternative 4

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be permanently prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes near spotted owl activity centers and PACs. This would reduce the risk of direct and indirect effects to the goshawk from motorized travel over the short and long-term. The effects are the same as described in Alternative 2.

In the long-term period (20 years), species habitat would be expected to recover from soil and vegetation impacts caused by unmanaged motorized travel, especially where unauthorized routes no longer receive motorized traffic.

Effects Due to Additions to the NFTS: Under this alternative, there would be 51 miles of trails and roads added to the system. Of those 51 miles approximately 0.2 miles would be added to the NFTS that intersect with goshawk PACs or territories. As seen in the table below (Table 177), there are fewer routes that are proposed under this alternative, which in turn, would be beneficial to wildlife; however, effective habitat use will be disturbed within the ZOI for goshawks due to edge effect. There is the potential that the species may not utilize the area because of noise and due to disturbance, there is potential for greater energy expenditure.

Effects Due to Changes to the NFTS: Alternative 4 would prohibit (close year round) use on 268 miles of existing NFTS roads. This is opposed to the 311 currently prohibited. Changes to season of use would occur on 1404 miles of existing NFTS. There would be 1530 miles of seasonal closures as opposed to the 472 that currently exist. While there would be 43 less miles closed year round, there would be 1058 miles more closed seasonally. These changes would incorporate the roads to be closed during the important time periods for species. These areas would have no disturbance from vehicles during the closure periods. Since the closure periods cover winter and early spring, early breeding activities such as pair-bonding and nest initiation may have fewer disturbances. However, this is also the period when roads are often blocked by snow drifts and unavailable for wheeled travel. Therefore, the seasonal closure impact is expected to be minor to undetectable.

Table 177. Northern Goshawk Indicators – Alternative 4

Indicators	
Miles of routes added to the NFTS within PACs	.2 miles
Number of PACs or territories intersected by routes added to the NFTS	2
Acres of routes added to the NFTS within ¼ mile (ZOI) of PACs	1294
Number of PACs occurring within ¼ mile added to NFTS	6
Percentage of gohsawk PACs (total acres) occurring within ¼ mile of the 'zone of influence'	11%

Alternative 5

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be permanently prohibited in this alternative. Direct and indirect effects are the same as described in Alternative 2.

Effects Due to Additions to the NFTS: Under this alternative there are 85 miles of routes to be added to the NFTS and 113 acres of areas to be added to the NFTS. Since there is an increase from Alternative 2 in the number of routes to be added to the system or converted to a trail, near activity centers and within preferred habitat, there would be a slight increase in the direct and indirect effects to goshawk within the project area.

The addition of routes to the NFTS within and near goshawk PACs would result in minor amounts of habitat fragmentation. Since the majority of these routes are narrow native surfaced routes they would only result in minor reductions in overhead cover and would not significantly reduce goshawk movement between habitat patches.

Effects Due to Changes to the NFTS: Actions proposed in this alternative would result in some indirect effects through habitat modification. There are 156 less miles of year round closures but 1128 more miles of seasonal closures. It would be a benefit to the species because more area would have closures during the important nesting time for goshawks.

Table 178. Northern Goshawk Indicators – Alternative 5

Indicators	
Miles of routes added to the NFTS within PACs	1.9 miles
Number of PACs or territories intersected by routes added to the NFTS or ML1 roads converted to trails (Percentage of all PACs in Project Area)	4
Acres of routes added to the NFTS within ¼ mile of PACs	2548 acres
Number of PACs occurring within ¼ mile (ZOI) added to NFTS	8
Percentage of goshawk PACs (total acres) occurring within ¼ mile of the 'zone of influence	15%

Table 179. Seasonal and Prohibited (Closed Year Round) Changes to NFTS roads Goshawk PACs

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Miles of Prohibited Roads	0 miles	10 miles/ 3395 ac	0	10 miles/3395 ac	8 miles/2697 ac
Seasonal closures to protect goshawk PACs	no	no	no	yes	yes

Cumulative Effects

In 2001 and 2004 the Forest Service amended Sierra Nevada Forest Plans to better address the needs of old forest-associated species (USDA 2001 and 2004). During this assessment, the following risk factors were identified for northern goshawks in the Sierra Nevada: 1) changes to the amount and quality of goshawk habitat from timber harvest and fuels treatments; 2) loss of breeding territories due to stand replacing fires; and 3) breeding site disturbance from vegetation treatments, human recreation or falconry harvest. Appendix E provides a list of cumulative projects on the forest. Some, but not all, of these activities will contribute to effects upon northern goshawks.

Vegetation/fuels reduction projects will continue to be the primary activity affecting goshawk habitat on the Forest. These projects will likely occur on estimated 2000 to 3000 acres per year on underburns and 1000 acres per year on pile burning (Ballard 2009).

The effect of open motorized routes on goshawk populations or habitats was not identified as a significant risk factor by the Forest Service, but breeding site disturbance from human recreation was addressed (USDA 2001 and 2004). Given the proportion of goshawk nest sites and habitat potentially affected, Alternative 1, may, overtime, contribute to cumulative effects to the goshawk populations. Alternative 1 does not restrict cross-country travel to designated routes, there is a high degree of uncertainty about future route proliferation in goshawk habitat which may have disturbance and habitat effects beyond the effects of routes open to motorized use. Alternative 3 contributes the least to cumulative effects because cross-country travel would be prohibited, open route densities in goshawk habitat are lowest and no motorized routes would be designated. Alternatives 2, 4 and 5 would result in progressively lower risk to goshawks due to the amount of motorized routes being added to the system.

Considering the proportion of goshawk habitat influenced by motorized routes and increases in recreation use and OHV activity, the alternatives may result in minor cumulative impacts when combined with other factors affecting goshawk habitat. Although the action alternatives may result in cumulative effects, they are minor in comparison to existing road densities and other potential impacts.

Great gray owl – Affected Environment

The great gray owl is listed as sensitive on the Pacific Southwest Region Forester's Sensitive Species List (USDA-FS 1998). In the Sierra Nevada, great gray owls are found in mixed coniferous forest from 2,400 to 9,000 feet elevation where such forests occur in combination with meadows or other vegetated openings. Nesting usually occurs within 600 feet of the forest edge and adjacent open foraging habitat. Most nests are made in broken top snags (generally first), but platforms such as old hawk nests, mistletoe infected limbs, etc. are also used. Nest trees or snags are generally greater than 21 inches in diameter at breast height (dbh) and 20 feet tall. There is approximately 9000 acres of suitable great gray owl habitat (nesting and foraging) within the analysis area.

There are 18 great gray owl PACs on the SNF.

Great gray owl – Environmental Consequences

The effects to great gray owls are expected to be similar to the effects to spotted owls because they use similar habitat for nesting and great gray owl foraging habitat (meadows) can be entered with OHVs if they don't damage resources under alternative ; however, vehicles are not allowed in meadows under the rest of the alternatives. The edge effect may not be as great because there are few routes that impact the suitable nesting habitat near to meadows.

Disturbance: There may be some disturbance to great gray owl nesting habitat if routes are within the area such as noise disturbance when vehicles are passing by.

Habitat loss, fragmentation and edge effects: There may be some loss of habitat or edge effect to great gray owls; however, it is thought to be minimal since technically routes are not supposed to be adjacent to meadows.

Alternative 1 – No Action

Effects Due to Continued Cross-country Travel: Cross-country travel would not be prohibited under this alternative. Therefore, it is assumed the route proliferation would continue over the short and long-term and the effects would be similar to those discussed under adding routes to the NFTS. No routes intersect known great gray owl nests. Currently there are 4.9 miles of routes that intersect 10 PACs. The use of these routes and the continued proliferation of new routes would result in increasing amounts of direct and indirect effects to great gray owls.

Effects Due to Additions to the NFTS: There are no routes or use areas identified to add to the NFTS under this alternative.

Effects Due to Changes to the NFTS: Under this alternative, there are no proposed changes to the current season of use NFTS road plan. Closure conditions would not change; therefore, there would be no changes to potential direct and indirect effects to the great gray owl.

Alternative 2 – Proposed Action

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes near great gray owl activity centers, territories and preferred habitat. This

would reduce the risk of direct and indirect effects to great gray owl from motorized travel over the short and long-term.

Effects Due to Additions to the NFTS: There are 0.11 miles of route that intersect great gray owl PACs. There would be potential noise disturbance to the owls if this route was included in the system.

Effects Due to Changes to the NFTS: Although the exact timing may vary, great gray owls start nesting near the month of March. Since seasonal closure would overlap the beginning of the nesting period and approximately 90 percent of the great gray owl PACs would be within the closures, it would reduce disturbance to owl within the PAC.

Table 180. Great Gray Owl Indicators – Alternative 2

Indicators	
Miles of routes added to the NFTS within PACs	0.11 miles
Number of PACs or territories intersected by routes added to the NFTS	1 PAC
Acres of routes added to the NFTS that intersect the one PAC	150 acres
Acres of habitat within ZOI	53
Acres of route ZOI within 600 feet of meadows in GGO habitat	134
Number of PACs occurring within ¼ mile of ZOI or routes added to NFTS	1
Percentage of great gray owl PACs (total acres) occurring within ¼ mile of the 'zone of influence'	5%

Alternative 3

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be permanently prohibited in this alternative. Direct and indirect effects are the same as described in Alternative 2.

Effects Due to Additions to the NFTS: Under this alternative, there would be no new routes or use areas proposed for addition to the NFTS; therefore, there would be no direct or indirect effect to great gray owls.

Effects Due to Changes to the NFTS: Under this alternative, there would be no changes to the seasons of use; the only ones implemented are those that currently exist. There would be no changes; therefore, there would be no new direct or indirect effects to great gray owls.

Alternative 4

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be permanently prohibited in this alternative. Direct and indirect effects are the same as described in Alternative 2.

Effects Due to Additions to the NFTS: This alternative would not result in the addition of any routes to the NFTS within great gray owl PACs or within ¼ mile of activity centers which is a benefit to the species because there would be less noise disturbance. In turn there would be less indirect effects to prey base because there are less routes disturbing owl habitat.

Effects Due to Changes to the NFTS: This alternative would not result in any changes to NFTS that would affect great gray owls because there are no routes within the PACs or within ¼ mile of activity centers.

Table 181. Great Gray Owl Indicators – Alternative 4

Indicators	
Miles of routes added to the NFTS within PACs	0 miles
Number of PACs or territories intersected by routes added to the NFTS	0
Acres of routes added to the NFTS that intersects PACs	0 acres
Acres of habitat within ZOI	895
Acres of route ZOI within 600 feet of meadows in GGO habitat	2423
Number of PACs occurring within ¼ mile of the ZOI of routes added to NFTS	3
Percentage of great gray owl PACs (total acres) occurring within ¼ mile of the 'zone of influence'	16%

Alternative 5

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes near great gray owl activity centers, territories and preferred habitat. This would reduce the risk of direct and indirect effects to great gray owls from motorized travel over the short and long-term.

Effects Due to Additions to the NFTS: There is one route in Miami, TR-08, which has the most potential to disturb great gray owls because it intersects the PAC, which in turn is habitat. Of the 9000 acres of suitable habitat there would be 150 acres of routes (ZOI for TR-08) that intersect habitat.

Effects Due to Changes to the NFTS: As stated for other species, changes that occur with a more restrictive closure for great gray owl habitat would be a benefit because there would be less disturbance.

Table 182. Great Gray Owl Indicators – Alternative 5

Indicators	
Miles of routes added to the NFTS within PACs	0.11 miles
Number of PACs or territories intersected by routes added to the NFTS	1 PAC
Acres of routes added to the NFTS that intersects the one PAC	150 acres
Acres of habitat within ZOI	1255
Acres of route ZOI within 600 feet of meadows in GGO habitat	3531
Number of PACs occurring within ¼ mile added to NFTS	3
Percentage of great gray owl PACs (total acres) occurring within ¼ mile 'zone of influence'	16%

Cumulative Effects

Appendix E provides a list and description of cumulative projects on the Forest. Some, but not all, of these activities will contribute to effects upon great gray owls. Factors responsible for low numbers of great gray owls breeding in the Sierra Nevada are not fully known.

In some meadows, livestock grazing has reduced the suitability of meadow vegetation for microtine rodents and other great gray owl prey (USDA 2001).

Although human disturbance has not been recognized as a significant threat to great gray owls, the use of motor vehicles, in meadow habitats can have significant impacts to meadow hydrology. The greatest risk of impacts to great gray owls and their habitats is in Alternative 1 since it would not prohibit cross-country travel and meadows are often easily accessed by vehicles. Therefore, the direct and indirect effects of Alternative 1 and the effects of continued livestock grazing may have significant impacts to individuals. The direct and indirect effects of motorized routes within meadows in Alternatives 2, 4 and 5, combined with the effects of past and continued livestock grazing, may adversely affect meadow habitats and associated species. Since the action alternatives would only result in disturbance to some individuals and would not impact meadow hydrology they would not likely result in impacts to a population within the project area.

American marten – Affected Environment

The American marten is designated by the Regional Forester as a Sensitive Species and is selected as a Management Indicator Species on the SNF. Martens prefer coniferous forest habitat with large diameter trees and snags, large down logs, moderate-to-high canopy closure and an interspersion of riparian areas and meadows. Important habitat attributes are: vegetative diversity, with predominately mature forest; snags; dispersal cover; and large woody debris (Allen 1987). Martens selected stands with greater than 40 percent canopy closure for both resting and foraging and avoided stands with less than 30 percent canopy closure (Spencer et al. 1983). Martens generally avoid habitats that lack overhead cover, presumably because these areas do not provide protection from avian predators (Allen 1982, Bissonette et al 1988, Buskirk et al. 1994, Spencer et al. 1983).

At a landscape scale, patches of preferred habitat and the distribution of openings with respect to habitat patches may be critical to the distribution and abundance of martens (Buskirk et al. 1994). While marten use small openings and particularly meadows for foraging, these openings must occupy a small percent of the landscape. Martens have not been found in landscapes with greater than 25 percent of the area in openings (Hargis and Bissonette 1997; Potvin et al. 2000). As landscapes become fragmented, the combination of increasing isolation and decreasing patch size of suitable habitat compounds the results of simple habitat loss (Andren 1994). For species like marten, this is likely to result in a decrease of greater magnitude than can be explained solely by the loss of suitable habitat. Marten may be a species that demonstrate exponential population declines at relatively low levels of fragmentation (Bisonette et al. 1997, *in* USDA Forest Service 2004).

The entire project area is 856,869 acres, of that there are approximately 65,950 acres of habitat for the marten (8 percent of the area).

Pacific fisher – Affected Environment

The Pacific fisher is designated by the Regional Forester as a Sensitive Species. Martes pennanti is the only extant species of the fisher. On April 8, 2004, in a 12-month finding for a petition to list the west coast distinct population segment of the fisher, the USFWS added the fisher to the list of candidate species.

Fishers in the western United States are habitat specialists associated with mature and late-successional forests with an abundance of large trees, snags and logs (greater than 39 in), conifers and oaks with broken tops and cavities, coarse woody-debris, multiple canopy layers, high canopy closure and few openings (Aubry and Houston 1992; Buck et al. 1994; Buskirk and Powell 1994; Dark 1997; Freel 1991; Jones and Garton 1994; Powell and Zielinski 1994; Seglund

1995; Truex et al. 1998; Zielinski 1999). The fisher is among the most habitat-specific mammals in North America and changes in the quality, quantity and distribution of available habitat can affect their distributional range (Buskirk and Powell 1994). Forest type is probably not as important to fishers as the vegetative and structural aspects that lead to abundant prey populations and reduce their vulnerability to predation (Powell 1993).

California Wildlife Habitat Relationships (CWHR) structure classes 4M, 4D, 5M, 5D and 6 in ponderosa pine, montane hardwood-conifer, mixed conifer, montane riparian, aspen, red fir, Jeffrey pine, lodgepole pine, subalpine conifer and eastside pine have been identified as those most likely to provide suitable denning and resting fisher habitat (Freel 1991). Zielinski (pers. comm. 2006) minimized potential suitability of red fir, lodgepole pine, subalpine conifer and eastside pine habitats for use by fishers in the southern Sierra; therefore, the SNF modified the habitat classification to include CWHR types 4D, 5D and 6. In review with Zielinski (pers. comm. 2006), foraging definition was not applicable due to the generalist use of habitats by foraging fishers.

The Southern Sierra Fisher Conservation area (SSFCA) is 720,609 acres across the Forest or 1108 square miles in size. There are 588,892 acres of the SSFCA in the analysis area, 306,488 acres of which are suitable habitat.

In 2007, the Conservation Biology Institute developed a model predicting the probability of fishers occurring in areas of the southern Sierras (Spencer, et al. 2007). Tables 183 through 187 display, by each alternative, the miles of motorized routes proposed for addition by probability of fisher detection. The known maternal and natal den sites are in the following probability categories: 0-19%; 20-39%; 40-59% and 60-79%. There are no known den sites in the 80-100% probability, at this time.

American marten and Pacific fisher – Environmental Consequences

Direct and Indirect Effects

Disturbance: The marten could be affected by loss of dens, increased disturbance of individual martens and by indirect impacts to prey. Motorized use has the potential to result in direct mortality on higher speed roads, collapse den sites, resulting in the potential loss of adults or young. Motorized use can also increase disturbance, resulting in additional energy expenditures. Indirectly, vehicles can affect the squirrel populations that marten primarily feed on. Squirrel populations may be impacted by increased disturbance resulting in lowered energy reserves available for the production of young. If cross-country travel occurs to the extent that soil compaction was to occur, food resources for squirrels, particularly truffles, could be diminished. Reduced production of young and reduced production of food would reduce the size of squirrel populations available for marten to prey upon.

Zielinski et al. (2008) studied the effects of motor vehicles (including over the snow vehicles) on marten in the Lake Tahoe National Forest and SNF. They evaluated the effects at the two study sites by comparing marten occupancy rates and probabilities of detection in areas where recreational vehicle us is allowed and encouraged (use areas) with wilderness areas where vehicles are prohibited (non-use areas). Martens were exposed to relatively low levels of disturbance in the study areas. They estimated that a marten might be exposed to 0.5 vehicle passes/hour and that this exposure had the greatest effect on <20 percent of a typical home range area. In addition, most motor vehicle activity occurs during the day when martens tend to be less active. The risks posed to martens may not be perceived by martens as great enough to relocate or they may habituate to the disturbance. The study did not, however, measure behavioral, physiological or demographic responses, so it is possible that motor vehicles may have effects, alone or in concert with other threats, that were not quantified in the study. As stated by Zielinski

as a management implication, placing routes so they avoid high-quality marten habitat (late successional conifer forests near meadows and riparian areas (Spencer et al. 1983) will minimize the possibility that martens encounter motor vehicle stimuli when they are actively engaged in foraging or social behavior.

There are fewer disturbances to martens because most motor vehicle activity occurs during the day when martens tend to be less active. Even if proven significant, most of the effects of noise disturbances are mild enough that they may never be detectable as changes in population size or population growth against the background of normal variation (Bowles *in* Knight and Gutzwiller 1995).

Reviewing Zielinski's paper (Zielinski et al. 2008), none of the response variables measured in suggested martens was affected by the level of motor vehicle use that occurred in the study sites. The approach assumed that if increased motor vehicle use had negative effects on martens they would observe 1) fewer occupied sample units, 2) greater nocturnal behavior or 3) few females in the areas. The approach excluded measuring the potential direct effects of motor vehicles on individual martens and they do not know how they would react in the presence of motor vehicles or their sound or whether their exposure to vehicles generates a stress response that produced deleterious effect on reproduction or survival.

Habitat loss, fragmentation and edge effects: Roads in general contribute to habitat fragmentation, a reduction in habitat connectivity and potential for road kill of **fishers and marten** and their prey. Noise, dust and associated disturbance will be site specific and relatively short term, but may extend into adjacent forest areas.

In general, fishers use forest or woodland landscape mosaics that include conifer-dominated stands and avoid entering open areas that have no overstory or shrub cover (Buskirk and Powell 1994). They select forests that have low and closed canopies. Late-successional coniferous or mixed forests provide the most suitable fisher habitat because they provide abundant potential den sites and preferred prey species (Allen 1987).

Habitat modification resulting from the removal of near ground vegetation and coarse woody material appears to be the primary potential effect of adding routes to the NFTS. Localized areas of low growing native vegetation may be modified (e.g. crushed or uprooted). This could result in a minor reduction in habitat for forest birds and rodents which form the majority of prey items for American martens.

There are two ZOIs used for fisher. The 700 acre den site buffer was used, in addition to the standard ¼ mile, because there are known den sites on the SNF. Also the 700 acre buffer is management direction from the SNFPA 2004.

Alternative 1 – No Action

Effects Due to Continued Cross-country Travel: Cross-country travel would not be prohibited under this alternative. Therefore, it is assumed the route proliferation would continue over the short and long-term and the effects would be similar to those discussed under adding routes to the NFTS. Under Alternative 1 there are 38 miles of NFTS routes that are within the 700 acre den site buffers (See Table 183).

The amount of habitat affected is determined by the zone of influence (within ¼ mile) from the 700 acre den site buffer. Alternative 1 would have the greatest impact to fisher habitat because it has the largest number of open motorized routes to the public and the highest road density. There are 2799 miles of routes in the SSFCA under Alternative 1.

The ZOI shows there are 5818 acres of habitat that are affected by vehicle disturbance, under Alternative 1. Fisher may leave the area or hide while the vehicles drive on the routes.

Although occasional direct mortality may occur from collisions with off-road vehicles, this appears to be an exceedingly rare event for species in this group and has not been reported to occur within the Forest. The mortalities that have occurred were on major highways 168 and 41.It is possible this could occur under this alternative; however, given existing use and mobility of the species within this group, such occurrences would remain rare and inconsequential to species population dynamics. At the long-term analysis point, assuming an increase of off-highway use, direct mortality events would occur more frequently, probably increasing at a rate similar to the rate of increase of off-highway use.

Included in cross-country travel are the effects from continuation of use on 550 miles of unauthorized routes and 125 acres of use areas. The linear effects of travel routes can include disturbance, displacement and microclimate changes (Gaines et al., 2003). Disturbance can lead to physiological responses such as increased stress hormones (Wasser et al. 1997 as reported in Gaines et al., 2003).

A larger impact, both in the short term and the long term, would be disturbance that would cause individuals to move or alter behavior. This alternative would provide potential disturbance to species within this group. The amount of disturbance that would affect any of the species is dependent on vehicle use, with more vehicles potentially being more disturbances. The information discussed below is species specific.

Table 183. Fisher Indicators – Alternative 1

Indicators	
Miles of routes added to the NFTS within probability of fisher detection	0-19 percent = 326.0 20-39 percent = 45.4 40-59 percent = 102.6 60-79 percent = 59.2 80-100 percent = 24.4
Number of routes in SSFCA	608 routes
Miles of routes in SSFCA	70.4 miles of routes
Density in SSFCA	50 mi/sq. mi
Miles of routes within 700 acre den site buffers	38 miles
Miles of routes within ¼ mile of den site buffers	16 miles/72 routes

Effects Due to Additions to the NFTS: There are no routes or use areas identified to add to the NFTS under this alternative; therefore, there will be no direct or indirect effects.

Effects Due to Changes to the NFTS: Under this alternative, there are no proposed changes to the current season of use NFTS road plan. Closure conditions would not change; therefore, there would be no changes to potential direct and indirect effects to the marten and fisher.

Alternative 2 – Proposed Action

Effects Due to the Prohibition of Cross-country Travel: This alternative would prevent disturbance to the species within this group by prohibiting cross-country travel. In the long-term period (20 years), species habitat would be expected to recover from soil and vegetation impacts caused by unmanaged motorized travel, especially where unauthorized routes no longer receive motorized traffic. The species would not be affected by disturbance, trampling or indirect impacts to prey or food resources from cross-country vehicle travel.

Effects Due to Additions to the NFTS: This alternative would add a total of 46 miles of routes to the NFTS. Table 184 displays the proposed routes within habitats used by the species. The

addition of 46 miles of routes could affect the late-successional species because there would be noise disturbance to the species. This alternative would contain 7 percent less routes (46/552) than Alternative 1.

Actions proposed in this alternative would result in some indirect effects through habitat modification. The addition of routes to the NFTS within preferred fisher habitat would result in minor amounts of habitat fragmentation. Since the majority of these routes are narrow native surfaced routes they would only result in minor reductions in overhead cover and would not significantly reduce fisher movement between habitat patches.

There are no known den sites that are intersecting with the routes or use areas that are proposed for this alternative.

Effects Due to Changes to the NFTS: Under this alternative there are changes to the seasonal open period for 753 miles of routes. While there would be 204 vs. 311 miles closed year round, there would be 1014 miles versus 472 seasonally closed. These areas would have minimal disturbance from vehicles during the closure periods. Since the closure periods cover winter and early spring, early breeding activities such as pair bonding and nest initiation may have fewer disturbances. However, this is also the period when routes are often blocked by snowdrifts and unavailable for wheeled travel. Therefore, the impact is expected to be variable by year and minor to undetectable. Closure and removal of roads has been found to effectively provide wildlife security and increase the amount of available wildlife habitat.

Table 184. Fisher Indicators – Alternative 2

Indicators	
Miles of routes added to the NFTS within probability of fisher detection	0-19 percent = 33.1 20-39 percent = 4.3 40-59 percent = 5.4 60-79 percent = 3.4 80-100 percent = 3.4
Number of routes in SSFCA	47 routes
Miles of routes in SSFCA	12 miles of routes
Density in SSFCA	.085 mi/sq. mi
Miles of routes within 700 acre den site buffers	0 miles
Miles of routes within ¼ mile of den site buffers	0 miles

Alternative 3

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be permanently prohibited in this alternative. Direct and indirect effects are the same as described in Alternative 2.

Effects Due to Additions to the NFTS: Under this alternative, there would be no new routes (Table 185) or use areas proposed for addition to the NFTS; therefore, there would be no direct or indirect effect to marten and fisher.

Effects Due to Changes to the NFTS: Under this alternative, there would be no changes to the seasons of use; the only ones implemented are those that currently exist. There would be no changes; therefore, there would be no new direct or indirect effects to marten and fisher.

Table 185. Fisher Indicators – Alternative 3

Indicators	
Miles of routes added to the NFTS within probability of fisher detection	0-19 percent = 0 20-39 percent = 0 40-59 percent = 0 60-79 percent = 0 80-100 percent = 0
Number of routes in SSFCA	0 routes
Miles of routes in SSFCA	0 miles of routes
Density in SSFCA	0 mi/sq. mi
Miles of routes within 700 acre den site buffers	0 miles
Miles of routes within ¼ mile of den site buffers	0 miles

Alternative 4

Effects Due to the Prohibition of Cross-country Travel: This alternative would prevent disturbance to the species within this group by prohibiting cross-country travel. In the long-term period (20 years), species habitat would be expected to recover from soil and vegetation impacts caused by unmanaged motorized travel, especially where unauthorized routes no longer receive motorized traffic. The potential impacts discussed under Alternative 1 from cross-country travel would not occur. The species would not be affected by disturbance, trampling or indirect impacts to prey or food resources.

As seen in Table 186 there are fewer routes that will be implemented which in turn could be beneficial to wildlife because there would be less disturbance.

Effects Due to Additions to the NFTS: This alternative adds 42 miles of NFTS motorized trails and 9 miles of roads. The addition of routes would have a minimum impact on the marten and fisher because there are no known den sites that will be impacted. There is the potential that the species may not utilize the area because of noise and due to disturbance there is potential for greater energy expenditure.

Since there is a decrease in Alternative 4 in the number of routes added to the system within fisher habitat, there would be a decrease in direct or indirect effects to fisher within the project area. These decreases would result in fewer individuals being impacted and less habitat being fragmented and this alternative is unlikely to result in impacts to fisher populations within the analysis area.

Alternative 2 and 4 would have similar impacts because approximately the same amount of miles of road would be added to the existing system. There would be some effects to fisher, such as noise disturbance or displacement, because of roads being opened. However, as shown in Tables 184 through 186 there are no routes within the den site buffers, which are core areas used by fishers.

Effects Due to Changes to the NFTS: Alternative 4 would prohibit (close year round) use on 268 miles of existing NFTS roads. This is opposed to the 311 currently prohibited. However, changes to season of use would occur on 1404 miles of existing NFTS. Currently there are 472 miles of seasonal closures; however, under this alternative there would be 1530 miles of seasonal closures. These changes would incorporate the roads to be closed during the important time periods for species. These areas would have no disturbance from vehicles during the closure periods. Since the closure periods cover winter and early spring, early breeding activities such as pair-bonding and nest initiation may have fewer disturbances. However, this is also the period

when roads are often blocked by snow drifts and unavailable for wheeled travel. Therefore, the seasonal closure impact is expected to be minor to undetectable.

Table 186. Fisher Indicators – Alternative 4

Indicators	
Miles of routes added to the NFTS within probability of fisher detection	0-19 percent = 21.8 20-39 percent = 5.0 40-59 percent = 14.3 60-79 percent = 5.7 80-100 percent = 3.0
Number of routes in SSFCA	23 routes
Miles of routes in SSFCA	5 miles of routes
Density in SSFCA	0.037 mi/sq. mi
Miles of routes within 700 acre den site buffers	0 miles
Miles of routes within ¼ mile of den site buffers	0 miles

Alternative 5

Effects Due to the Prohibition of Cross-country Travel: This alternative would prevent disturbance to the species within this group by prohibiting cross-country travel. In the long-term period (20 years), species habitat would be expected to recover from soil and vegetation impacts caused by unmanaged motorized travel, especially where unauthorized routes no longer receive motorized traffic.

Effects Due to Additions to the NFTS: This alternative is similar to Alternative 2 in that it would add the 85miles of unauthorized routes to the NFTS. Under this alternative, there would be the potential for the greatest effect because there are the most routes open within the SSFCA which in turn could be the greatest noise disturbance to the marten and fisher.

Effects Due to Changes to the NFTS: Miles of roads to be prohibited would be 268. Seasonal closure changes would occur on 1404 miles of roads. There are 155 miles of roads under Alternative 5 that are prohibited.

These changes would incorporate the roads to be closed during the important time periods for species. These areas would have no disturbance from vehicles during the closure periods. Since the closure periods cover winter and early spring, early breeding activities such as pair-bonding and nest initiation may have fewer disturbances. However, this is also the period when roads are often blocked by snow drifts and unavailable for wheeled travel. Therefore, the seasonal closure impact is expected to be minor to undetectable.

Table 187. Fisher Indicators – Alternative 5

Indicators	
Miles of routes added to the NFTS within probability of fisher detection	0-19 percent = 42.6 20-39 percent = 8.4 40-59 percent = 22.2 60-79 percent = 12.0 80-100 percent = 5.4
Number of routes in SSFCA	68 routes
Miles of routes in SSFCA	15 miles of routes
Density in SSFCA	.109 mi/sq. mi
Miles of routes within 700 acre den site buffers	0 miles
Miles of routes within ¼ mile of den site buffers	0 miles

Table 188. Summary of Acres of Past and Current Activities and Acres Affected for Late-successional Species

Disturbance	Total acres across the analysis area per disturbance	Acres Affected per disturbance	Direct and Indirect Effects	Change in Amount of Habitat
Prescribed fire	19,191	1535	Habitat quality reduction through removal of understory veg., some snags and downed logs	8 percent change
Wildfire	40,003	2104		5 percent change
Vegetation Management (Timber Sales included) *	526,689	5498	Habitat reduction	1 percent change
Hazard Trees	6089	?		
Plantations	47,465	3164		7 percent
Private land	95,725	unknown		
Special Uses	1812			
Livestock grazing	743,247			
Recreation facilities	3242			

*uneven age treatment, clear cutting, thinning, hand release, chemical release and planting in plantations <30 yrs. old.

SUMMARY OF MIS CUMULATIVE EFFECTS ANALYSIS

Currently, there are about 247 miles of roads that go through late seral closed canopy coniferous forest habitat within the analysis area. The roads include Forest Service system roads, private roads and roads maintained by other Federal, State and county agencies. Together, the roads and unauthorized routes form a road density of 2.72 mi./sq. mi. within the habitat (Table 172). While the exact relationship between road density and California spotted owl, American marten and Northern flying squirrel populations has not been studied, one can assume that the higher the road density, the greater the amount of habitat taken out of effective MIS use. When motorized routes are close together, their zone of influences join. When road density exceeds a certain point, the habitat does not provide any place for undisturbed reproduction, foraging or resting to occur. Over time, if the road density remains too high, existing habitat may be avoided and representation of MIS on the Forest would decline.

Except for necessary administrative use, about 24 miles of NFTS routes within the habitat are closed year round. Once closed, they would not generate impacts upon nesting, resting and foraging MIS, nor would they likely cause avoidance behavior in the MIS. Within as little as 5 years, these routes can become overgrown from lack of maintenance and use; thereby decreasing edge effects and nest parasitism associated with roads. Nevertheless, closed routes are occasionally opened up (generally every 20 to 30 years) for timber/salvage sales or fire access and impacts would result for about 5 years or so until vegetation along the routes grew back again.

In addition to year round closures, about 8.3 miles of roads within the analysis area are seasonally closed during the reproductive season of the late seral closed canopy MIS. It is reasonable to assume that some of these routes occur in late seral closed canopy coniferous forest habitat.

Closure during that time would decrease human disturbances to nesting birds. Nevertheless, since the MIS still utilize the habitat after the reproductive season, the ZOIs for these roads will still be included in the computation of acres taken out of effective MIS use.

About 1.2 acres of managed use areas currently exist within the habitat.

Other activities within the analysis area cumulatively affect the habitat. There are currently around 220 campgrounds, picnic areas, vista points, trailheads, boat ramps, administrative sites, pack stations, resorts and summer home tracts, encompassing roughly 3,242 acres, which exist on National Forest System (NFS) lands within the analysis area. As well, there are about 1,300 miles of hiking trails; and about 76 miles of powerlines, the Sugar Pine Railroad, water systems, fiber optic cable systems, amphitheaters and apiaries that operate under special use permits on NFS within the analysis area. It is reasonable to assume that some of each habitat within the analysis area has and will continue to be taken out of effective MIS use by recreational, administrative and special use sites. Nevertheless, the amount is assumed to be small in comparison to the amount of habitat available within the analysis area.

About 95,725 acres of private lands (such as Southern California Edison, Pacific Gas and Electric and residential areas) occur within the analysis area. Together, they encompass about 15 percent of it. These private lands are dispersed throughout oak woodland, shrubland and forested habitats, so it is reasonable to assume that only a small percent of each habitat has and will be impacted by activities on private lands.

There are 28 active cattle allotments, encompassing about 743,247 acres and permitting 17,000 animal unit months (AUMs) within the analysis area. Some of the cattle allotments encompass late seral closed canopy coniferous forest habitat. Nevertheless, it is assumed that cattle would not impact this habitat because closed canopy stands would not contain a lot of understory grasses and shrubs to attract them.

CDFG (2005) lists loss of habitat via timber harvesting as a factor impacting all three MIS species. About 526,639 acres of timber sales have/will occur within the analysis area within the timeframe of the cumulative effects analysis. Some of these sales have likely reduced the amount of habitat available for MIS by opening up the canopy cover. About 612 acres of late seral closed canopy coniferous forest habitat has had some type of timber sale within them. These sales have likely improved the growth, vigor, health and resistance of the stands.

As well, 6,089 acres of hazard sales have/will occur within the analysis area have likely removed some trees within late seral closed canopy coniferous forest habitat. However, removal would likely be dispersed enough to prevent significant impacts upon the habitat.

CDFG lists fuel reduction/prescribed fire activities as one of the factors that impacts late seral closed canopy MIS. Nevertheless, USFWS states that the short-term negative impacts are ameliorated by the longer-term benefit of reducing the greater risk of catastrophic wildfire. About 1,535 acres of prescribed burns have/will occur in late seral closed canopy coniferous forest habitat within the analysis area. Prescribed burns have/will likely benefit the habitat by removing excess fuel buildup and making the habitat less susceptible to wildfires.

About 2,104 acres of wildfires have occurred in late seral closed canopy coniferous forest habitat within the analysis area. Viewing historical fires records of the High Sierra RD, it is foreseeable that about 1,866 additional acres would burn on the District in the foreseeable future. The same acreage is assumed for the Bass Lake RD, as well. While some of the burned areas were/would be replanted, it will/would take decades for the habitat to develop. It is likely that a significant portion, however, was/would not be replanted and did/would convert to shrubland habitat. Under the current funding trend (last 10 years), only about 10 percent of burned coniferous forest habitats have been replanted (Rojas 2008). Nevertheless, it is anticipated that only around 9

percent of late seral closed canopy habitat within the analysis area has/will be impacted by wildfires.

Under the No Action Alternative, road density would be decreased from 2.72 to 2.70 mi./sq. mi. since unauthorized routes on NFS lands approximately above 6800 ft in elevation would not be carried forward and are anticipated to recover with lack of use. Together, the: (1) existing roads (encompassing 47,967 zone of influence (ZOI) acres); (2) unauthorized routes carried forward (encompassing 16,923 ZOI acres); (3) managed use areas (encompassing about 1 acre); and (4) unauthorized use areas carried forward (encompassing 15 acres) would impact about 64,906 acres of late seral closed canopy coniferous forest habitat. Nevertheless, because 25 miles of the NFTS roads in this habitat (encompassing 9,225 ZOI acres) would be closed year round, acres of habitat taken out of effective use is likely closer to 55,681 acres or 84 percent of the habitat (See MIS report, Strand and Sanchez 2009, for further detail).

Wildfires have decreased the late seral closed canopy habitat within the analysis area by about 9 percent. Past timber sales have further decreased the representation of the habitat within the analysis area. Past motorized travel has contributed as much as an 86 percent decline in the effectiveness of the habitat. Of all the alternatives, the No Action alternative would contribute the smallest gain to habitat effectiveness. It would provide only a 2 percent improvement.

Appendix E, in the DEIS, displays all the cumulative effects for past, present and reasonably foreseeable future activities. The table listed below is just those projects that affect the late successional species.

As stated in Table 188 there is minimal change to the habitat over time through all activities that have occurred on the SNF. There are 48 miles of road that are in goshawk PACs and 805 miles of road which intersect Spotted Owl PACs across the SNF. There are 2799 miles of road that are in the SSFCA. Under Alternative 1, within the fisher vegetation query there are 471 miles of routes.

Under Alternative 1, there is the most effect to the species in this wildlife group because there is such a large amount of unauthorized use across the analysis areas.

Removal of the habitat acres listed below is expected to be dispersed across the landscape; therefore, the impact to habitat would likely prevent significant impacts to the wildlife.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Trends

Late seral closed canopy - California spotted owl, American marten, Northern flying squirrel. The SNF MTM Project will directly, indirectly and cumulatively affect between 26,898 acres of late seral closed canopy coniferous forest habitat (lowest) under the Proposed Action alternative and 55,681 acres (highest) under the No Action Alternative. The acres affected range from 3 percent to 6 percent of the total Sierra Nevada-wide acreage. Motorized travel on the SNF has slightly decreased the existing bioregional trend in the habitat and has likely created a slight decrease in the distribution of California spotted owl, American marten and Northern flying squirrel across the Sierra Nevada bioregion. Implementation and enforcement of the SNF Motorized Travel Management Plan would likely improve the bioregional trend in the habitat and increase distribution of these species across the bioregion. The improvement would only be slight under the No Action alternative, but would increase under the action alternatives, with Alternatives 2 being the best, followed by alternatives 4, 5, then 3. For further detail, see Strand and Sanchez 2009.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Sooty Grouse Trend. Late seral open canopy - The SNF MTM Project will directly, indirectly and cumulatively affect between 758 acres of late seral open canopy coniferous forest habitat (lowest) under the Proposed Action alternative and 1393 acres (highest) under the No Action Alternative. Because the acres

affected range from only 1 to 12 percent of the total Sierra Nevada-wide acreage, the SNF Motorized Travel Management Project will not change the existing bioregional trend in the habitat, nor will it lead to a change in the distribution of sooty grouse across the Sierra Nevada bioregion.

Ungulates: Affected Environment

Mule Deer

The mule deer is selected as the Management Indicator Species within the oak associated hardwood and hardwood/conifer habitat on the SNF. The LRMP indicates that mule deer use a mix of all successional stages, but the most important mule deer habitat types are early successional types, hardwoods and shrublands. Most deer on the SNF migrate seasonally between higher elevation summer range and low elevation winter range. In general, critical winter range, critical summer range and fawning habitats represent key habitats for deer where heavier use and higher quality habitats for wintering and summer use are expected to occur.

Mule deer are the most important big game species on the SNF. Yosemite, Huntington, Oakhurst, San Joaquin and North Kings are the principal deer herds. Although a few animals occupy winter ranges throughout the year, each herd is predominately migratory. The SNF provides the majority of summer and winter range for the San Joaquin, Huntington and North Kings herds. The forest also provides most of the summer range for the Oakhurst herd and a portion of winter range for the Yosemite herd.

Ungulates: Environmental Consequences

Mule deer

Displacement or Avoidance: In general, mule deer will move away from or flush, from an approaching person and will usually allow a person in or on a vehicle to get closer than a person on foot (Freddy et al. 1986, Wisdom et al. 2004). Wisdom et al. (2004) found that mule deer showed little measurable flight response to experimental motor vehicle treatments but cautioned that deer may well be responding with fine-scale changes in habitat use (i.e. avoidance), rather than substantial increases in movement rates and flight responses. Several studies have found that mule deer avoid areas in proximity to roads. Deer avoid primary roads more than secondary or tertiary roads and also avoid roads more in open habitats as opposed to areas with vegetative or topographic cover (deVos et al. 2003).

Various studies have shown that mule deer have displacement distances that vary between 200 and 800 meters (656 feet and 2625 feet), depending upon the road type and traffic level and the surrounding habitat (Perry and Overly 1977, Rost and Bailey 1979). One studied showed that if habitat was available away from a linear road or trail, then deer avoided the disturbance corridor (Jalkotzy et al. 1997). However, when no suitable deer habitat was available away from the road or trail, then deer used the habitat adjacent to the road or trail. Rost and Bailey (1979) reported that deer and elk in Colorado avoided roads, especially within 200 meters (656 feet) of a road. Perry and Overly (1977) reported that deer were displaced up to 800 meters (2625 feet) from roads.

Main roads were found to reduce deer use up to 0.5 miles (800 m), whereas secondary and primitive roads reduced deer densities from between 200 to 400 meters (0.12 to 0.25 miles) in these studies. Additional variables such as the amount and frequency of traffic and the spatial distribution of roads in relation to deer use, influence the degree of negative effects that roads have on deer use in forested habitats (Perry and Overly 1977, deVos et al. 2003). Where disturbance causes deer to avoid areas within preferred habitats, animals may be forced into less

preferred or lower quality habitats. Such shifts, particularly if repeated, can result in adverse impacts to the energy balance of individual deer and ultimately can decrease population productivity, especially on winter ranges (deVos et al. 2003).

Collisions: Vehicle collisions with deer can contribute considerably to direct deer mortality. Deer are probably the most frequently-killed large mammal along North America's roads. The Insurance Institute for Highway Safety commissioned a study which estimated that more than 1.5 million deer/vehicle collisions occur annually, resulting in more than 29,000 human injuries and 150 deaths. Romin and Bissonette (1996) conservatively estimated that the U.S. National deer road kill in 1991 totaled at least 500,000 deer. Deer road kills vary considerably by region and by season. In California, mule deer road kill along a 3 mile stretch of secondary highway was estimated at 3.7 and 4.8 per kilometer per year during spring and fall migrations, respectively (Jalkotzy et al. 1997).

Deer and vehicle collisions probably differ by the type of road or trail, so care must be given when considering deer-vehicle collisions. The majority of deer-vehicle collisions occur in the early morning or late afternoon and evening hours, around dawn and sunset, when the deer are most active and when visibility is poor. More deer-vehicle collisions occur during the spring and fall when deer are migrating and in the rut. In the fall, hunting may cause deer to be more wary and increase movement of deer. In the spring, vegetation tends to green-up along roadsides and attract deer to roads. There are little to no data on deer road kills along Forest roads, however roads maintained at a higher standard for passenger vehicle (maintenance levels 3, 4, and 5), where vehicle speeds are greatest, have the most potential to contribute to deer-vehicle collisions. Deer-vehicle collisions on roads and trails which are maintained for high clearance vehicles (maintenance level 2 roads) are probably not appreciable in number due to the lower speeds and the amount of use received by these roads.

In migration the evidence indicates that wildlife avoids traffic on roads, but not that roads interrupt migrations. Acute noise exposure does not affect the course of migration significantly, although it can cause short detours or an increase in the rate of travel.

Edge and Marcum (1985) reported that elk leave a 0.3 to 0.6 mile (500-1000 m) buffer zone around logging roads when traffic is high (at a rate of a few transits per day), but not at other times. Similar observations have been made for deer (Dorrance et al 1975; Singer and Beattie 1986). The range at which animals avoided traffic was approximately the range at which they could detect traffic noise, suggesting that traffic noise was meaningful through association with human activity.

Alternative 1 – No Action

Effects Due to Continued Cross-country Travel: Cross-country travel would not be prohibited under this alternative. Therefore, it is assumed the route proliferation would continue over the short and long-term and the effects would be similar to those discussed under adding routes to the NFTS.

The montane hardwood habitat is described in detail in this section because it represents a portion of habitat that is utilized by deer. The other habitat utilized by deer is encompassed in the analysis for holding areas, populations centers, winter range and migration corridors.

Under the no action alternative, 202,836 acres of montane hardwood habitat would remain open for motorized cross-country travel. While a high flight response from individual deer likely occurs from this activity, impact upon habitat use is not likely significant. As explained in the project description, deer would not likely avoid using habitat that is only occasionally disrupted by non-threatening motor vehicle travel off motorized routes. Studies show that the higher the

disturbance rate, the less the response rate. Nevertheless, this does not hold true when the disturbance is related to a threatening activity such as hunting.

While occasional cross-country travel does not have significant effect upon use of montane hardwood habitat, the more regular use of unauthorized routes and use areas associated with cross-country travel do. They can cause: (1) habitat avoidance; and/or (2) fawning, resting and foraging disturbance. Under the no action alternative, with the continuation of cross-country travel, use of about 112 miles of unauthorized routes and 57 acres of unauthorized use areas permitted within the habitat under the No Action alternative.

Impacts are most significant in: (1) deer population centers during the reproductive season (July); (2) deer winter range from December through April; and/or (3) deer holding areas during migration seasons (May 15-June 15, Oct 1-Nov 30 above 5,000 feet; and May 1-June 1, Oct 15-Nov 30 below 5,000 feet).

Disturbance in population centers during July likely reduces reproductive success. Adequate foraging is critical for milk production. The greater the disturbances related to vehicular travel, the more time spent in alert or in flight and the less time foraging. Road traffic itself may not elicit much response, but when vehicles stop and people get out, disturbance level increases. About 1,071 acres of deer population centers within montane hardwood are taken out by unauthorized routes (including their ZOIs) and 0.4 acres are taken out by unauthorized use areas.

Disturbance in deer winter range likely affects an individual's survival. While the flight response of deer tends to be less in winter, when elicited, the impact is higher because it is critical to consume and conserve energy in winter. About 38,298 acres of deer winter range within montane hardwood are taken out by unauthorized routes (including their ZOIs) and 7.4 acres are taken out by unauthorized use areas.

Disturbance in holding areas during migration can indirectly impact an individual's reproductive success in summer and survivability in winter. During spring migration, it is important to conserve energy reserves because poor reserves affect fetal development and fawn survival (CDFG 1984). During fall migration, it is important to consume enough browse and/or acorns to pre-fatten for winter (Ibid); therefore, the less energy expended in flight and the more time grazing, the better. About 3,078 acres of deer holding areas within montane hardwood are taken out by unauthorized routes (including their ZOIs) and 0.4 acres are taken out by unauthorized use areas.

Effects Due to Additions to the NFTS: There are no routes or use areas identified to add to the NFTS under this alternative. The use of these routes and the continued proliferation of new routes would result in increasing amounts of direct and indirect effects to mule deer.

Effects Due to Changes to the NFTS: Under this alternative, there are no proposed changes to the current season of use NFTS road plan. Closure conditions would not change; therefore, there would be no changes to potential direct and indirect effects to the mule deer.

Table 189. Alternative 1 and 3 – Deer Winter Range

Indicators	
Miles of routes existing to the NFTS within deer winter range	51 miles
Acres of routes added to the NFTS within ZOI of winter range	1667 acres

Alternative 2 – Proposed Action

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be prohibited under this alternative. Therefore, it is assumed this would limit the proliferation of illegally created routes within all types of mule deer habitat. This would reduce the risk of direct and indirect effects to mule deer from motorized travel over the short and long-term. Prohibited routes would eventually become ecologically adjusted and associated vegetative cover within the affected habitat would be increased.

Effects Due to Additions to the NFTS: Actions proposed in this alternative would likely increase disturbance to some mule deer within the project area. Increases in road densities and percentages of habitat influenced by motor vehicles on summer and winter range would likely result in increased disturbance to some mule deer within the project area. Although these increases may result in disturbance to some individuals, they would not likely have a measurable impact to populations. There is one deer holding area out of 15, which is 6.7 percent of all holding areas, affected by intersecting routes. There is one out of 30 population centers (3.3%) that are affected with added routes (Table 199).

There are 46 miles of routes and 1 area (6 acres) identified to add to the NFTS under this alternative. The use of these routes and the continued proliferation of new routes would result in increasing amounts of direct and indirect effects to deer.

Table 190. Alternative 2 – Deer Migration Corridors

Indicators	
Miles of routes added to the NFTS within deer migration corridors	7.8 miles
Acres of routes added to the NFTS within ZOI of migration corridors	819 acres

Table 191. Alternative 2 – Deer Winter Range

Indicators	
Miles of routes added to the NFTS within deer winter range	3 miles
Acres of routes added to the NFTS within ZOI of winter range	1186 acres
Number of winter range areas that intersect with routes	1

Table 192. Alternative 2 – Deer Population Centers

Indicators	
Miles of routes added to the NFTS within deer population centers	1 miles
Acres of routes added to the NFTS within ZOI of population centers	415 acres
Number of population centers that intersect with routes	2

Effects Due to Changes to the NFTS: The Proposed Action alternative would also decrease impacts occurring from currently existing NFTS routes. While it would decrease miles of prohibited NFTS roads that are closed year round from 311 to 204 miles, it would increase miles of NFTS roads that are seasonally closed from 472 to 1,014 miles. Combined, closure periods

would be changed on 753 miles of prohibited or seasonally-closed roads. For montane hardwood habitat, this means that: (1) 161 miles of roads that impact the habitat would be closed year round (as opposed to the 34 currently closed); and (2) 18.9 miles would be seasonally closed during critical deer use periods (as opposed to the 32.5 miles currently closed). About 19 miles would be closed in deer winter range during deer use, one mile would be closed in holding areas during migration and no routes would be closed in population centers while deer are fawning. Zones of influence would be significantly decreased on these roads and less acres of habitat would be taken out of effective MIS use.

Alternative 3

Effects Due to the Prohibition of Cross-country Travel: This alternative would prevent disturbance to the species within this group by prohibiting cross-country travel. In the long-term period (20 years), species habitat would be expected to recover from soil and vegetation impacts caused by unmanaged motorized travel, especially where unauthorized routes no longer receive motorized traffic. The potential impacts discussed under Alternative 1 from cross-country travel would not occur.

Motorized cross-country travel and use of all the unauthorized routes and use areas created by past cross-country travel would be prohibited on the SNF.

Effects Due to Additions to the NFTS: Under this alternative, there would be no new routes or use areas proposed for addition to the NFTS; therefore, there would be no direct or indirect effect to mule deer.

Effects Due to Changes to the NFTS: Under this alternative, there would be no changes to the seasons of use; the only ones implemented are those that currently exist. There would be no changes; therefore, there would be no new direct or indirect effects to mule deer.

Alternative 4

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be prohibited under this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes within deer habitat. This would reduce the risk of direct and indirect effects to mule deer from motorized travel over the short and long-term. This would affect montane hardwood habitat by prohibiting vehicular use on all unauthorized routes within the habitat except for about 7 out of the 99 currently existing miles. Road density in this habitat would be decreased from 1.92 mi./sq. mi. to 1.64 mi./sq. mi. Prohibited routes would eventually become ecologically adjusted and associated vegetative cover within the affected habitat would be increased.

Effects Due to Additions to the NFTS: There is one holding area out of 15 (6.7 percent) affected by the addition to the NFTS, under this alternative. There are two winter ranges out of six affected by additional routes (Table 199). There is one population center out of 30 that are intersected with additional routes.

Table 193. Alternative 4 – Deer Migration Corridors

Indicators	
Miles of routes added to the NFTS within deer migration corridors	3.9 miles
Acres of routes added to the NFTS within ZOI of migration corridors	1439 acres

Table 194. Alternative 4 – Deer Winter Range

Indicators	
Miles of routes added to the NFTS within deer winter range	3.3 miles
Acres of routes added to the NFTS within ZOI of winter range	1053 acres
Number of winter range areas that intersect with routes	3

Table 195. Alternative 4 – Deer Population Centers

Indicators	
Miles of routes added to the NFTS within deer population centers	2.9 miles
Acres of routes added to the NFTS within ZOI of population centers	1285 acres
Number of population centers that intersect with routes	1

Effects Due to Changes to the NFTS: Changes to the existing NFTS would impact montane hardwood habitat by: (1) closing 108 miles of roads that impact the habitat year round (as opposed to the 37 currently closed); and (2) seasonally closing 22 miles during critical deer use periods (as opposed to the 14 currently closed). About 21 miles would be closed in deer winter range during deer use; 1 mile would be closed in holding areas during migration.

Wet weather seasonal restrictions of native surface motorized roads and trails are analyzed for the project alternatives. Alternatives 4 and 5 provide additional wet weather seasonal restrictions, which may benefit deer that may be using areas that are not currently under existing LRMP deer seasonal restrictions. In areas outside current LRMP closure areas, the wet weather seasonal closures would provide an additional four months wet weather closure and would reduce the effects of motor vehicles upon deer using these areas.

Alternative 5

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be prohibited under this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes within deer habitat. This would reduce the risk of direct and indirect effects to mule deer from motorized travel over the short and long-term. Alternative 5 would also decrease impacts to habitats within the analysis area from currently existing NFTS routes. It would decrease miles of prohibited NFTS routes that are closed year round from 311 to 155 miles and increase miles of NFTS routes that are seasonally closed from 488 to 1,721 miles.

Effects Due to Additions to the NFTS: Alternative 5 differs in that the highest amount of routes and use areas would be added (see Table 166 in the beginning of this chapter). Approximately 14 miles would become NFTS roads and 72 miles would become NFTS motorized trails.

Table 196. Alternative 5 – Deer Migration Corridors

Indicators	
Miles of routes added to the NFTS within deer migration corridors	13 miles
Acres of routes added to the NFTS within ZOI of migration corridors	4120 acres

Table 197. Alternative 5 – Deer Winter Range

Indicators	
Miles of routes added to the NFTS within deer winter range	7.6 miles
Acres of routes added to the NFTS within ZOI of winter range	2818 acres
Number of winter range areas that intersect with routes	5

Table 198. Alternative 5 – Deer Population Centers

Indicators	
Miles of routes added to the NFTS within deer population centers	5 miles
Acres of routes added to the NFTS within ZOI of population centers	2085 acres
Number of population centers that intersect with routes	2

Effects Due to Changes to the NFTS: Changes to the existing NFTS would impact montane hardwood habitat by: (1) closing 70 miles of roads that impact the habitat year round (as opposed to the 34 currently closed); and (2) seasonally closing 28.3 miles during critical deer use periods (as opposed to the 32.5 miles currently closed). About 26.8 miles would be closed in deer winter range during deer use, 1.5 miles would be closed in holding areas during migration.,

Wet weather seasonal restrictions would be the same as discussed under Alternative 4. There would be a slightly higher effect than Alternative 4 because fewer routes would be closed.

Summary of Deer Areas

There is one deer holding area out of 15 which is 6.7 percent of all holding areas, affected by Alternatives 1 and 2. There are four (Kinsman Flat, Rodgers Ridge, Secata Cottonwood, South Fork Merced River), out of six (67 percent) deer winter range areas that are affected/intersect with unauthorized routes. There are two out of 30 (6.7 percent) population centers on the Forest that are affected/intersected with unauthorized routes.

Table 199. Deer Areas that are Intersecting with Existing (Alt 1) or Added Routes (Alts 2, 4 and 5)

Route	District	Alternative	District/ Analysis Unit	Holding Area	Winter Range	Population Center
AE-14z	BLRD	1,4,5	Mammoth		Kinsman Flat 5	
BP133	BLRD	1, 5	Mammoth		Kinsman Flat 5	
BP21	BLRD	1,5	Gaggs			Little Shuteye 7
BP24	BLRD	1, 5	Gaggs			Little Shuteye 7
BP37	BLRD	1,4,5	Gaggs			Little Shuteye 7
BP48	BLRD	1,4,5	Gaggs			Little Shuteye 7
JG10	BLRD	1,5	Gaggs		Rodgers Ridge 7	
JH-125	HSRD	1,2, 4, 5	Tamarack-Dinkey	Big Fir-Dinkey-Lower Dinkey 11		
PK-01zh	HSRD	1,2,5	Tamarack-Dinkey			Markwood 12
TH-10z	HSRD	1,5	Dinkey-Kings		Secata-Cottonwood/Rodgers Ridge 6_7	
TH-161z	BLRD	1,5	Globe			Little Shuteye 7
TH-28z	BLRD	1,4,5	South Fork		South Fork Merced River 2	
TH-29z	BLRD	1,5	South Fork		South Fork Merced River 2	
TH-69y	BLRD	1,4,5	Westfall		South Fork Merced River 2	
TH-74	BLRD	1,5	Westfall		South Fork Merced River 2	
TH-87	BLRD	1,5	Westfall		South Fork Merced River 2	
ZZ21	HSRD	1,4,5	Dinkey-Kings		Secata-Cottonwood/Rodgers Ridge 6_7	

Miles of Routes: To assess the potential direct and indirect impacts to deer from motorized route associated disturbance, the miles of motorized routes to be added to National Forest System were determined for each alternative by key deer habitat type (population centers, holding areas and winter range) within each of the deer herds. On the SNF, motorized road density was determined. Table 199 shows the average route densities within deer herd ranges under each Alternative (calculated by dividing the total road or trail mileage on NFS lands in deer ranges by the square miles of NFS lands in deer ranges).

For all major deer herds occurring within the boundaries of the SNF, Alternative 1 would have the greatest route density compared to all the action alternatives within essential population centers and winter ranges, especially on the west side of the Forest. Alternative 5 would have slightly greater route densities than all the remaining action alternatives. Within population centers and winter ranges, Alternative 1 poses a somewhat higher risk to all deer herds on the SNF and may therefore pose a greater risk in the ability for these deer herds to successfully reproduce and rear fawns, as compared to all the action alternatives. The action alternatives are not significantly different in their route densities and therefore, impacts to the Sierra deer herds within population centers and winter ranges do not vary greatly amongst the action alternatives. Alternative 1 route densities exceed the action alternatives by over 1 mile/square mile in some instances, where habitat effectiveness would be reduced.

Cumulative Effects

Past and current cumulative effects to mule deer include current and historic grazing of mule deer habitat; loss of habitat through catastrophic wildfires; timber and fuels management where cover and forage has been reduced or removed; urban development and expansion within a highly checkerboard land ownership pattern; and recreational activities including hunting, camping and general recreation activities including all forms of motorized use including four-wheel drive vehicles, ATVs and motorcycles.

Thinning treatments may result in the short-term reduction in cover for deer, though it is expected that in the longer term, habitat will be protected by reducing wildfire risk. Many recent, current and future vegetation and fuels reduction projects are emphasizing habitat improvement for deer by removing competing conifers within oak habitats and aspen habitats which are designed to enhance mule deer foraging condition.

Currently, there is a high demand for recreational use on the SNF due to its close proximity to urban centers. The SNF provides a wide variety of recreational experiences including developed and dispersed camping, hiking, fishing, hunting, wildlife viewing, winter sports activities (downhill skiing, cross-country skiing, snowmobiling), summer motor vehicle use, winter OSV use and a variety of other non-motorized use (equestrian use and mountain biking). Recreational use on the SNF has significantly increased compared to the past 20 to 30 years. Because of the proximity to urban areas and population growth, recreational use on the SNF is expected to continue to increase in the future including camping, hiking, fishing, wildlife viewing, hunting and motor vehicle use. Generally, the increase in recreational use on the SNF has the potential to cause an increase in negative interactions between humans and mule deer. Future increase in recreational use on the SNF is expected and therefore, increased disturbance to mule deer would be expected, particularly during the summer months.

Table 200 summarizes direct, indirect and cumulative impacts from reasonably foreseeable projects and a description of the potential impact to mule deer and their habitat.

Table 200. Direct, Indirect and Cumulative Impact to Mule Deer from Reasonably Foreseeable Future Projects

Project type	Mule Deer Direct and Indirect Impact	Overall Cumulative Impact
Vegetation management/fuels reduction – thinning,	Short-term disturbance from harvest activities, changes in cover, foraging habitat enhancement in oak habitats.	Short-term adverse impacts during harvest. Long-term beneficial cumulative effects by reduced risk of habitat loss from high severity wildfires.
Controlled burning and mastication in chaparall habitat	Short term impact from displacement	Long term improvement to deer forage condition
Hazard tree removal	Minimal impact. Short-term disturbance during harvest.	None to minimal cumulative impact
Special Use permit renewal	N/A administrative action	None
Non-motorized Trail development	Short-term disturbance during trail construction, some increased public use may increase disturbance.	Slight increase in cumulative impact.

Table 201 shows the amount of acres affected with regards to the oak-associated hardwood species. As it is shown below there have been mosaics of habitat created due to prescribed fire as well as wildfires. Plantations have also created a variety of habitat due to the different ages of the plantations.

Table 201. Summary of Acres of Suitable Habitat by Species Group for Oak-associated Hardwood and Hardwood/conifer Species

Disturbance	Total Acres	Acres Affected	Direct and Indirect Effects	Change in Amount of Habitat
Prescribed fire	19,191	7974	Habitat quality reduction through removal of understory veg., some snags and downed logs	42 percent change
Wildfire	40,003	21,352	Habitat loss	53 percent change
Vegetation Management (Timber Sales included) *	526,689	0	Habitat reduction able through change in CWHR density	1 percent change
Hazard Trees	6089		Short term noise disturbance	
Plantations	47,465	8290	Long term benefit future habitat for species.	17 percent change
Private land	95,725	Unknown		
Special Uses	1812	Unknown		
Livestock grazing	743,247	Unknown		
Recreation facilities	3242			

When considering all the cumulative effects of past, present and reasonably foreseeable future impacts from grazing, vegetation/fuels projects, wildfires and recreation, Alternative 1 poses the greatest risk to the 4 major deer herds on the SNF, where key winter ranges are influenced by unauthorized motorized routes and key summer ranges would be affected, depending on the deer herd. Alternative 5 slightly increases the amount of cumulative effects on key deer habitats over the other action alternatives, where site specific localized effects may occur. The remaining action alternatives are similar and only slightly increase overall cumulative impacts to the 4 major deer herds on the SNF. Alternative 3 does not add any routes, so does not add to existing cumulative impacts. All the action alternatives will result in a beneficial impact to all deer ranges across the SNF from the closure of unauthorized routes. Degree of benefit depends on the alternative (Alt 5 least miles closed, Alt 3 most miles closed). It is expected that non-motorized use may occur on these unauthorized routes which would likely result in disturbance to mule deer. Some studies indicate that certain non-motorized activities (hiking, mountain bicycling, equestrian, etc.) could actually result in greater disturbance to mule deer. At any rate, the amount of disturbance caused by non-motorized use will depend on the type, intensity, timing and duration of the use. As these closed unauthorized motorized routes become revegetated and recover over time, either through active or passive restoration efforts, overall mule deer disturbance from human activity is expected to diminish in the future.

In addition, Alternatives 3, 4, 5 would benefit deer on winter ranges through the implementation of wet weather closures on native surfaced roads and trails.

The same activities listed in Table 200 would apply to the alternatives; however, under alternative 4 overlayed with the other activities would have less of an impact to the species because there would be more seasonal closures and an increase on the number of roads prohibited. It is a benefit to wildlife because overall there would be less disturbance to the species and the habitat.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Mule Deer Trend. The SNF Motorized Travel Management Project will directly, indirectly and cumulatively affect between 63,584 acres of montane hardwood habitat (lowest) under the Proposed Action Alternative 3 and 152,801 acres (highest) under the No Action Alternative 1. The acres affected range from 8 percent to 19 percent of the total Sierra Nevada-wide acreage. Motorized travel on the SNF has likely decreased the existing bioregional trend in montane hardwood habitat and has likely created a decrease in the distribution of deer across the Sierra Nevada bioregion. Implementation and enforcement of the SNF Motorized Travel Management Plan would likely improve the bioregional trend in the habitat and increase distribution of the deer across the bioregion. The improvement would only be slight under the No Action alternative, but would increase under the action alternatives, with Alternative 2 being the best, followed by 4, 5, then 3.

Riparian-associated species: Affected Environment

Bald eagle – Affected environment

The bald eagle was delisted from the list of Federally threatened and endangered animal species in August 2007 and subsequently placed on the Regional Forester's Sensitive Species list. The bald eagle continues to be protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act (MBTA). There are five known bald eagle nests on the Forest at this time (Bass Lake (2 nests), Shaver Lake (SCE), Huntington Lake and Lake Edison).

Bald eagle – Environmental Consequences

Disturbance: The U.S. Fish and Wildlife Service developed National Bald Eagle Management Guidelines to advise land managers and others protective provisions to minimize impacts to bald

eagles, particularly where there may constitute "disturbance," which is prohibited by the Bald and Golden eagle Protection Act.

The bald eagle guidelines do not provide protection provisions for general motorized use, but it does provide the following guidelines for off-road vehicle use. During the breeding season, do not operate off-road vehicles within 300 feet of the nest. In open areas, where there is increased visibility and exposure to noise, this distance should be extended to 660 feet.

Habitat loss, fragmentation and edge effects: Roads may affect an animal's reproductive success. Productivity of Bald Eagles in Oregon and Illinois declines with proximity to roads and they preferentially nest away from roads. The reduced nesting success of eagles in proximity to roads may be more a function of the presence of humans than of the road itself (Trombulak and Frissell 2000).

The riparian buffer is too small and does not adequately represent the area where bald eagles nests are found. They are usually around large bodies of water not a 300 foot buffer to a stream; therefore, the ZOI used for bald eagle is ½ mile buffer around known nest sites.

Alternative 1 – No Action

Effects Due Continued Cross-country Travel: Cross-country travel would not be prohibited under this alternative. Therefore, it is assumed the route proliferation would continue over the short and long-term and the effects would be similar to those discussed under adding routes to the NFTS. Under this alternative the riparian associated species would have habitat degraded or removed because cross-country travel would continue and not be confined to particular routes. The protection measures that are set up for bald eagle would not be effective because cross-country use would continue.

There are nine routes in Alternative 1 that are within the ZOI of 1/2 mi of two different bald eagle nests. The actual nest is ¾ mile from the track locations.

For the Bass Lake nest site, a current Forest Order to close the route from January 1 to August 31 or 3 weeks after chicks are known to have fledged would continue to be enacted on an annual basis. This action has been sufficient to protect the nesting activity over several years as evidence by this pair's successful fledging of one to two young per year.

Nevertheless, unless cross-country use is repeated in the same area, creating unauthorized routes and use areas, impact would not likely be high enough to cause avoidance behaviors or reduce reproductive success.

Effects Due to Additions to the NFTS: There are no routes or use areas identified to add to the NFTS under this alternative.

Effects Due to Changes to the Existing NFTS: Under this alternative, there are no proposed changes to the current season of use NFTS road plan. Closure conditions would not change; therefore, there would be no changes to potential direct and indirect effects to the bald eagle.

Alternative 2 - Proposed Action

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be permanently prohibited across the Forest under this alternative. Prohibition of cross-country would limit motor vehicle use to current NFTS roads. Technically, it would limit the proliferation of illegally created routes.

Prohibition of cross-country motor vehicle travel would allow habitat to recover where degradation may be occurring. Currently there are 660,000 acres of suitable habitat that is being impacted by cross-country travel. If it is prohibited, 204 miles of routes would have the potential

to be restored. On some routes, recovery will achieve conditions similar to undisturbed areas within 5 to 30 years (see Soil Resource section).

Effects Due to Additions to the NFTS: To reduce disturbance to nesting bald eagles, land management agencies typically implement restrictions on certain activities within a buffer of nests. Latest recommendations in the design criteria from USFWS (2007) suggest 660 feet where there is increased visibility and exposure to noise. To minimize disturbance to foraging bald eagles, routes should be minimized or not allowed between nesting or roosting sites and foraging sites.

No unauthorized routes have been created in bald eagle habitat; therefore, none of the routes to be added are within this habitat.

Effects Due to Changes to the Existing NFTS: The Proposed Action alternative would also decrease impacts occurring from currently existing NFTS routes. While it would decrease miles of prohibited roads that are closed year round from 311 to 204 miles, it would increase miles of NFTS roads that are seasonally closed from 472 to 1014 miles. Combined, closure periods would be changed on 753 miles of prohibited or seasonally-closed roads. The changes listed above should not affect the known bald eagles because they are not in these areas at this time.

Alternative 3

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be permanently prohibited in this alternative. Direct and indirect effects are the same as described in Alternative 2.

Effects Due to Additions to the NFTS: Under this alternative, there would be no new routes or use areas proposed for addition to the NFTS; therefore, there would be no direct or indirect effect to bald eagles.

Effects Due to Changes to the Existing NFTS: Under this alternative, there would be no changes to the seasons of use; the only ones implemented are those that currently exist. There would be no changes; therefore, there would be no new direct or indirect effects to bald eagles.

Alternative 4

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be prohibited in this alternative. Prohibited cross-country travel would limit the proliferation of illegally created routes near bald eagles. This would reduce the risk of direct and indirect effects to bald eagles from motorized travel over the short and long-term.

Effects Due to Additions to the NFTS: Approximately 0.5 miles of routes and .10 acres of unauthorized use areas currently exist in riparian habitat within the analysis area; however, under this alternative it would be prohibited. There are no routes designated near known bald eagle nests sites; however, when the ZOI is applied there is one track (PK-06y) that is within ½ mile.

The bald eagle measures from Fish and Wildlife Service will be implemented which will provide further protection and are listed in the project record and under ‘disturbance’ on the previous page for bald eagle.

Effects Due to Changes to the Existing NFTS: Seasonal closures would decrease human-caused disturbances to birds during this critical time.

Alternative 5

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be prohibited in this alternative. Prohibited cross-country travel would limit the proliferation of

illegally created routes near bald eagles. This would reduce the risk of direct and indirect effects to bald eagles from motorized travel over the short and long-term.

Effects Due to Additions to the NFTS: There are no routes designated near known bald eagle nests sites; however, when the ZOI is applied there is one track (PK-06y) that is within ½ mile.

Effects Due to Changes to the Existing NFTS: Alternative 5 would be the same as Alternative 4.

Great gray owl

See above under late-successional forest associated species

Willow flycatcher – Affected Environment

In California, the willow flycatcher is a rare to locally uncommon, summer resident in wet meadow and montane riparian habitats at 600-2500 m (2000-8000 ft) in the Sierra Nevada and Cascade Range (CWHR 2005). Willow flycatcher populations in the Sierra Nevada are considered to be at risk (USDA-FS 2001). Historically, willow flycatchers were once common throughout the Sierra Nevada. The current distribution of the willow flycatcher has been drastically reduced compared to historic distributions. A ten year demographic analysis indicates that the Sierra Nevada willow flycatcher populations are continuing to decline. With the exception of a few sites, the majority of areas where willow flycatchers have been located support low numbers of breeding territories and some as low as one to two pairs of breeding individuals.

Willow flycatcher breeding habitat is characterized as montane wetland shrub habitat where there is a prevalence of willows and montane meadows with standing or flowing water or highly saturated soils throughout the nesting season (Green, et al. 2003). A study by Cain (2001) indicated that meadow wetness may assist in successful nesting by willow flycatcher by inhibiting potential forest and edge predators from accessing willow flycatcher nests. Meadow wetness may also be important for willow flycatcher insect prey species.

Western red bat – Affected Environment

Western red bats appear to be highly associated with intact riparian habitat, particularly willows, cottonwoods and sycamores. Winter habitat includes western lowlands and coastal regions south of San Francisco Bay. This bat roosts in tree foliage and occasionally shrubs along edge habitats adjacent to streams, fields or urban areas. Preferred roosts (for all roost types) are protected from above and located above dark ground cover and generally from 2 to 40 feet above ground. Roosts are generally hidden from view from all directions except below (to allow free flight from the roost). Red bats tend to roost out on the edge of the foliage at approximately one third of the height of the tree and mostly in the largest cottonwoods. Red bats prefer edge or habitat mosaics that have trees for roosting and open areas for foraging. Red bats have also been recorded using caves and mines or buildings (USDA-FS 2001).

Foraging occurs over grasslands, shrublands, open woodlands and forest and croplands; ridgetops to densely wooded timber stands, regeneration areas, powerline rights-of way, highways and old logging roads. Prey items mostly include moths, crickets, beetles and cicadas and may be taken from high above treetops to nearly ground level. They appear to have high foraging site fidelity. They have been recorded foraging under orchard and hardwood trees where understory is open. They require water (USDA-FS 2001).

Riparian-associated species: Environmental Consequences

Willow flycatcher and Western red bat - Environmental consequences

Disturbance: Wildlife species associated with riparian habitats are particularly vulnerable to the effects of recreation activities on their habitat because of the concentration of these activities in riparian areas. Riparian habitats occur in narrow, linear configuration that is often traversed by roads and trails. Because of the availability of open water, cover and concentrated food sources, these habitats are used by wildlife disproportionately to their availability (Gaines et al. 2003, SNEP 1996).

Habitat loss, fragmentation and edge effects: The Willow Flycatcher Conservation Assessment (Green et al. 2003) identified roads as one of the leading contributing factors responsible for the loss and degradation of willow flycatcher habitat. Specifically, roads (dirt-surfaced or paved), intercept surface and subsurface hydrological flow. Meadow desiccation occurs when hydrological flows are intercepted and redirected which may result in long-term habitat loss or degradation. Roads may have a negative impact on meadow hydrology, especially when roads bisect meadows and have associated drainage structures to maintain road conditions. Human disturbance associated with road and trail motorized use may also affect willow flycatcher nesting success. Roads also provide increased access to humans which may directly and indirectly affect willow flycatcher productivity. Roads provide access for livestock grazing and often meadows occupied by willow flycatchers are key forage areas for livestock. Livestock grazing has long been identified as contributing to the decline in willow flycatcher populations as it relates to grazing impacts on willow and meadow habitat, as well as potential direct impacts from cattle coming in direct contact or destroying nest sites.

There are 10 miles of routes within the Riparian Conservation Area (RCAs) as described in the hydrology section. This could be a potential impact to the habitat because vegetation is possibly being trampled and destroyed. RCAs cover a larger area than is assigned to the Riparian habitat under MIS (see MIS report, Strand and Sanchez 2009). The RCA buffer can range from 150 to 300 feet depending on the class of stream. When a creek has year round water there will be a larger buffer than one that is ephermal or intermittent.

Recreation activities in willow flycatcher habitat can have effects similar to livestock grazing, although to a lesser extent and intensity in many cases. In addition, the supplemental food provided by developed and dispersed recreation in close proximity to riparian areas and meadows, as well as movement corridors provided by trails, may indirectly affect willow flycatchers through an increase in local abundance of brown headed cowbirds as well as nest predators, both native (such as jays, squirrels and chipmunks) and non-native (cats, dogs) (SNFPA FEIS, USDA-FS 2004a Ch 3 Part 4).

As discussed above, the western red bat utilizes riparian habitat as well. Of the 264 acres of riparian habitat there are 210 acres that are within the elevation band 3000 feet or below and considered suitable habitat.

There are 264 acres of riparian habitat within the entire analysis area as described in the MIS report (Strand and Sanchez 2009) and is summarized here. The table below shows the ZOI by alternative for riparian habitat.

Table 202. Riparian Habitat Indicators by Alternative

	Acres Open to Motorized Cross-country Travel	Miles of Roads/ Motorized Trails (NFTS, other public, private)	Route Density (mi./sq. mi.)	Acres of Managed Use Areas	Acres and % Habitat Influenced by Motorized Routes and Use Areas	% Gain in Habitat Effectiveness
Alt.1	264 (including 0.05 miles of unauthorized routes and 0.10 acres of unauthorized use areas outside of NFS lands displayed in Figure 1)	1.5	3.78 [1]	0	203 = 77% [2]	0%
Alt.2	0	1.5	3.66	0	143.5 = 54%	23%
Alt.3	0	1.5	3.66	0	182 = 69%	8%
Alt.4	0	1.5	3.66	0	141 = 53%	24%
Alt.5	0	1.5	3.66	0	150 = 57%	20%

[1] Includes unauthorized routes that could have use with authorized cross-country travel

[2] Includes unauthorized routes and use areas that could have use with authorized cross-country travel

Table 203. Acres of ZOI by Alternative for Riparian Habitat

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
203 ac	141 ac	182 ac	141 ac	150 ac

Table 204. Motorized Routes that Intersect with Willow Flycatcher (WIFL) Occupied Meadow Sites

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
0.51 miles or 9 intersecting routes	0 mi	0 mi	0 mi	0 mi

Alternative 1 – No Action

Effects Due Continued Cross-country Travel: Cross-country travel would not be prohibited under this alternative. Therefore, it is assumed the route proliferation would continue over the short and long term and the effects would be similar to those discussed under adding routes to the NFTS. Under this alternative the riparian associated species would have habitat degraded or removed because cross-country travel would continue and not confined to particular routes.

Effects Due to Additions to the NFTS: There are no routes or use areas identified to add to the NFTS under this alternative.

Effects Due to Changes to the Existing NFTS: Under this alternative, there are no proposed changes to the current season of use NFTS road plan. Closure conditions would not change, therefore, there would be no changes to potential direct and indirect effects to the willow flycatcher or western red bat.

Alternative 2 – Proposed Action

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be permanently prohibited across the Forest under this alternative. Prohibition of cross-country would limit motor vehicle use to current NFTS roads. Technically, it would limit the proliferation of illegally created routes.

Prohibition of cross-country motor vehicle travel would allow habitat to recover where degradation may be occurring.

Effects Due to Additions to the NFTS: There are 0.05 miles of routes that have been created in riparian habitat; however, there are no occupied meadows within ¼ mile of routes to be added.

Effects Due to Changes to the Existing NFTS: Changes to the existing NFTS would impact the delineated riparian habitat by closing 0.08 miles of routes within the habitat year round. Currently none are closed. Zones of influence would be significantly decreased on this route and less acres of habitat would be taken out of effective MIS use. Closure and removal of roads has been found to effectively provide wildlife security and increase the amount of available wildlife habitat (Wildlands CPR 2008).

As well, more routes within the habitat would likely be closed during the reproductive season of the bat since this alternative closes 18.9 vs. 9.4 miles or 50 percent more routes during this critical time period. Seasonal closures would decrease wildlife human-caused disturbances during this critical time.

Alternative 3

Effects Due to the Prohibition of Cross-country Travel: This alternative would prevent disturbance to the species within this group by prohibiting cross-country travel. In the long-term period (20 years), species habitat would be expected to recover from soil and vegetation impacts caused by unmanaged motorized travel, especially where unauthorized routes no longer receive motorized traffic. The potential impacts discussed under Alternative 1 from cross-country travel would not occur.

Effects Due to Additions to the NFTS: Under this alternative, there would be no new routes or use areas proposed for addition to the NFTS; therefore, there would be no direct or indirect effect to bald eagles.

Effects Due to Changes to the Existing NFTS: Under this alternative, there would be no changes to the seasons of use; the only ones implemented are those that currently exist. There would be no new direct or indirect effects to willow flycatcher or Western red bat.

Alternative 4

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be prohibited in this alternative. Prohibited cross-country travel would limit the proliferation of illegally created routes near western red bat or willow flycatchers. This would reduce the risk of direct and indirect effects to western red bat and willow flycatcher from motorized travel over the short and long-term.

Effects Due to Additions to the NFTS: Only 0.05 miles of routes have been created in riparian habitat; an insignificant amount of routes encompassing 0.05 miles ZOI acres would be added within this habitat. While it would add some of the habitat's unauthorized routes to the NFTS, miles added would be insignificant and would increase the amount of habitat impacted by only 0.5 acres (<1 percent). There are no occupied WIFL sites affected by routes in this alternative.

Effects Due to Changes to the Existing NFTS: It would close 0.05 miles of NFTS routes year round. None are currently closed. As well 43.2 miles vs. 9.4 miles would be seasonally closed during the reproductive season for the bat and would prohibit vehicular use on the 0.8 acres of unauthorized use areas.

Alternative 5

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be prohibited in this alternative. Prohibited cross-country travel would limit the proliferation of illegally created routes near willow flycatchers and western red bat habitat. This would reduce the risk of direct and indirect effects to willow flycatchers and western red bat habitat from motorized travel over the short and long-term.

Effects Due to Additions to the NFTS: Approximately 0.02 miles (9 ZOI acres) of routes would be added. None are currently closed. It would close 0.05 miles of NFTS routes year round. There is one route (JM-21z) that is within ¼ mile of an occupied meadow for the willow flycatcher.

Effects Due to Changes to the Existing NFTS: Zones of influence would be significantly decreased on these routes and less acres of habitat would be taken out of effective MIS use. As well, more routes within the habitat would likely be closed during the reproductive season of the bat since this alternative closes 72.4 vs. 9.4 miles or 87 percent more routes during this critical time period. Seasonal closures would decrease human-caused disturbances to wildlife during this critical time.

Cumulative Effects

The same list of cumulative effects, mentioned previously, is also pertinent to riparian species. When you add this activity on to the existing activities on the landscape there would be more of an impact due to the cross-country use that would continue through important habitats.

CUMULATIVE EFFECTS TO RIPARIAN MIS HABITAT

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Yellow Warbler Trend
The SNF MTM Project will directly, indirectly and cumulatively affect between 141 acres of riparian habitat (lowest) under alternative 4 and 203 acres (highest) under Alternative 1. Because the acres affected account for less than 1 percent of the total Sierra Nevada-wide acreage, the SNF MTM Project would not change the existing bioregional trend in the habitat, nor would it lead to a change in the distribution of yellow warblers across the Sierra Nevada bioregion.

Cavity-Dependent species: Affected Environment

Habitat for snag associated species (cavity nesting birds and bats) is considered forest vegetation types with snags larger than 15 inches in diameter. Motorized route-associated factors likely to affect these species are edge effects and the reduction of snags and down logs. Nest of cavity nesting birds are typically more secure from predation than other forest birds and recreational disturbance is not known to be a limiting factor as it is for some other forest bird species (Gaines et al. 2003).

The entire analysis area contains about 417,307 acres of coniferous forest stands. Of these, 40,364 acres are classified as early seral coniferous forest habitat. While there are likely some medium to large diameter trees within this habitat, the majority of trees are <15” in diameter at breast height (dbh). Therefore, it is assumed that the amount of suitable snags >14.9”dbh provided by this habitat is insignificant. Thus, these acres will not be included in the computation of snags in green forest habitat. For the purpose of this report, it will be assumed that all mid seral coniferous forest stands provide snags in green forest habitat (even though it includes trees would be as small as

11" dbh, as well as those as large as 23.9" dbh). Adding up all acres of mid and late seral coniferous forest stands; the analysis area provides about 376,943 acres of green forest snag habitat.

About 1,550 miles of NFTS roads, private roads and other public roads (State, county, other Federal) exist in green forest snag habitat within the analysis area.

Pallid bat – Affected Environment

Pallid bats are found in a variety of habitats below 10,000 feet elevation throughout California. In the SNF, they can be associated with oak woodlands, ponderosa pine, mixed conifer, rock crevices and giant sequoia habitats. Tree roosting has been documented in large conifer snags (e.g. ponderosa pine), inside basal hollows of redwoods and giant sequoias and bole activities in oaks (Sherwin 1998). The pallid bat tends to be a roosting habitat generalist that utilizes many different natural and manmade structures (FEIS V3Ch3 part 4.4 page 55) (USDA-FS 2001). Pallid bats commonly roost under bridges at night, but can also use caves and mines. Day roosts are more varied and include rock outcrops, tree hollows, buildings, bridges, caves and mines. Roost temperatures are important and must be below 104 degrees Fahrenheit (40 degrees Celsius). Foraging habitat requirements appear to be more restrictive. The pallid bat forages close to the ground, often crawling across the ground, preying on large, ground dwelling arthropods such as beetles, scorpions and Jerusalem crickets. Large moths and grasshoppers are consumed to a lesser degree. Pallid bats appear to be more prevalent within edges, open stands, particularly hardwoods and open areas without trees (FEIS V3Ch3 part 4.4 page 55) (USDA-FS 2001).

Cavity dependent species: Environmental Consequences

Habitat loss, fragmentation and edge effects: Snag and log reduction occurs as an indirect effect of managing roads or trails for public use. Trees posing a potential safety hazard ("hazard trees") are removed along roads and trails open for public use, as well as roads receiving concentrated use during implementation of a specific project. Hazard trees are typically dead or dying trees that occur within a 300 feet from either side of the road. This safety policy results in a reduction in snags within a zone of 300 feet from a road's edge. This, in turn, reduces habitat quality and availability for cavity nesting birds and other snag-dependent species within these roadside corridors. As stated on the SNF, hazard tree removal adjacent to lower standard roads (e.g. maintenance level 2) or motorized trails is not as common as it is adjacent to more heavily traveled routes (e.g. paved roads, main road corridors on Forest).

Alternative 1 – No Action

Effects Due to Continued Cross-country Travel: Cross-country travel would not be prohibited under this alternative. Therefore, it is assumed the route proliferation would continue over the short and long term and the effects would be similar to those discussed under adding routes to the NFTS. Under this alternative the snag associated species would have habitat degraded because cross-country travel would continue and not confined to particular routes.

If cross-country motorized use continued, it would be a direct effect to the species in this group because the public could potentially disturb habitat. It may allow access to roost sites yet undiscovered, such as caves, which could be subject to disturbance; however, the number of snags available would not change in the alternative.

Under the no action alternative, 298,507 acres of green forest snag habitat would remain open for motorized cross-country travel.

The 66,373 acres of late seral closed canopy coniferous forest habitat that is open for motorized cross-country use is likely too dense for vehicular travel off routes. Furthermore, some of the mid

seral stands are likely too dense. Therefore, less than 232,134 acres of green forest snag habitat are likely impacted by motorized cross-country travel. While the number of acres potentially affected is still high, the Pallid bat would not likely avoid using habitat that is only occasionally disrupted by motorized cross-country travel. Therefore, impact of cross-country travel upon habitat use is assumed to be insignificant.

While cross-country travel does not have significant effect upon use of green forest snag habitat, unauthorized routes and use areas associated with cross-country travel do. Use areas that are within the habitat and routes that are in or < ¼ mile from the habitat likely increase: (1) roosting and maternal sites disturbance; and/or (2) habitat avoidance. The period of greatest sensitivity occurs during nest building and incubation (Gotmark 1992 *in* Knight and Gutzwiller 1995) when the individual is more likely to abandon the site; it is thought it would be similar for bats roosting and maternal sites. Similar for bats, parental attentiveness may be disturbed; thereby, disrupting feeding patterns and increasing the chance that young may become stressed and/or predated upon.

Effects Due to Additions to the NFTS: There are no routes or use areas identified to add to the NFTS under this alternative; therefore, there will be no direct or indirect effects to the species or the habitat.

Effects Due to Changes to the Existing NFTS: Under this alternative, there are no proposed changes to the current season of use on NFTS roads plan. Closure conditions would not change; therefore, there would be no changes to potential direct and indirect effects to Pallid bat.

Alternative 2 – Proposed Action

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be permanently prohibited across the Forest under this alternative. Prohibition of cross-country travel would limit motor vehicle use to current NFTS roads. Technically, it would limit the proliferation of illegally created routes.

Prohibition of cross-country motor vehicle travel would allow habitat to recover where degradation may be occurring. This would affect green forest snag habitat by prohibiting vehicular use on all unauthorized routes within the habitat except for about 21 out of the 263 currently existing miles.

Effects Due to Additions to the NFTS: The added facilities may cause noise disturbance to the species and would eliminate snags habitat within 300 feet of the added routes. It is important to have closure periods for wildlife because it helps with less energy being expended so they do not feel threatened to leave an area.

Effects Due to Changes to the Existing NFTS: For green forest snag habitat: (1) 338 miles of roads that impact the habitat would be closed year round (as opposed to the 145 currently closed). Less acres of habitat would be removed. As well, more routes within the habitat would likely be closed during the hibernation and maternal seasons of the bat since this alternative would close 17.8 vs. 8.3 miles or 53 percent more routes during this critical time period. Seasonal closures would decrease human-caused disturbance during these times.

Alternative 3

Effects Due to the Prohibition of Cross-country Travel: This alternative would prevent disturbance to the species within this group by prohibiting cross-country travel. In the long-term period (20 years), species habitat would be expected to recover from soil and vegetation impacts caused by unmanaged motorized travel, especially where unauthorized routes no longer receive motorized traffic. The potential impacts discussed under Alternative 1 from cross-country travel would not occur.

Effects Due to Additions to the NFTS: Under this alternative, there would be no new routes or use areas proposed for addition to the NFTS; therefore, there would be no direct or indirect effect to cavity dependent species.

Effects Due to Changes to the Existing NFTS: Under this alternative, there would be no changes to the seasons of use; the only ones implemented are those that currently exist. There would be no changes; therefore, there would be no new direct or indirect effects to cavity dependent species.

Alternative 4

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be prohibited in this alternative. Prohibited cross-country travel would limit the proliferation of illegally created routes. This would reduce the risk of direct and indirect effects to Pallid bats from motorized travel over the short and long term.

Effects Due to Additions to the NFTS: Twenty-seven miles of routes and 13 acres of use areas are added under this alternative. There would be snag habitat lost because snags would have to be removed where motorized use would occur so there wouldn't be a hazard within 300 feet of the road to vehicles.

Effects Due to Changes to the Existing NFTS: For green forest snag habitat, this means that: (1) 290 miles of NFTS routes that impact the habitat would be closed year round. As well, more routes within the habitat would likely be closed during the reproductive season of the hairy woodpecker since this alternative would close 41.5 vs. 8.3 miles or 80 percent mores routes during this critical time period. While seasonal closures would not decrease ZOI acres, it would decrease impacts upon the MIS by decreasing human-caused disturbances to them during their reproductive season.

Alternative 5

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be prohibited in this alternative. Prohibited cross-country travel would limit the proliferation of illegally created routes near Pallid bat habitat. This would reduce the risk of direct and indirect effects to Pallid bat habitat from motorized travel over the short and long term.

Effects Due to Additions to the NFTS: Forty-two miles of routes are added and 52 acres of use areas are added, under this alternative. The largest amount of habitat would be affected because the highest amount of routes and use areas would be added.

Effects Due to Changes to the Existing NFTS: Alternative 5 would also decrease impacts to habitats within the analysis area from currently existing NFTS roads. For green forest snag habitat, this means that: (1) 214 miles of roads that impact the habitat would be closed year round (as opposed to the 145 currently closed). Less acres of habitat would be removed. There are 72.4 versus 8.3 seasonally closed which would mean less human disturbance.

Cumulative Effects

The same list of effects as previously mentioned would pertain to this habitat type. There are currently 1,385 miles of roads that go through green forest snag habitat within the analysis area. The roads include Forest Service system roads, private roads and roads maintained by other Federal, State and county agencies. Snags and snag replacements (hazard trees) are generally removed within 300 feet along both sides of roads for safety purposes. Nevertheless, it is likely that they are not removed along prohibited NFTS routes that are closed year round (unless deemed necessary during administrative use). Furthermore, NFTS routes closed year round would

likely impact effective use of the habitat. As with roads, snags are removed inside and within 300 feet of managed use areas for safety purposes. Therefore, they have removed somewhat more than 13 acres of green forest snag habitat within the analysis area, as well.

Cumulative Effects of Green Forest Snag MIS habitat and Relationship of Project-Level Habitat Impacts to Bioregional-Scale Hairy Woodpecker Trend: Representative of the entire forest, there are currently 3.1 snags/ac within analysis area. Broken into specific forest types, there are 2.3 snags/acre in ponderosa pine, 3.5 snags/acre in mixed conifer and 4.0 snags/acre in red fir. The SNF MTM Project is not anticipated to impact the number of snags/acre within the analysis area; however, it would impact the amount of habitat available within the analysis area. It will directly, indirectly and cumulatively affect between 93,638 acres of green forest snag habitat (lowest) under the Proposed Action alternative and 111,247 acres (highest) under the No Action Alternative and Alternative 3. The acres affected account for about 3 percent of the total Sierra Nevada-wide acreage of green forest snag habitat (which was estimated by adding mid and late seral coniferous forest habitat acreages). Motorized travel on the SNF has slightly decreased the existing bioregional trend in the habitat and has likely created a slight decrease in the distribution of hairy woodpecker across the Sierra Nevada bioregion. Implementation and enforcement of the action alternatives would likely improve the bioregional trend in the habitat by a slight amount and slightly increase distribution of these species across the bioregion.

The following three MIS habitat types (shrubland and early and mid seral habitat) are not represented in any of the above listed habitats and the species are not covered above; therefore, the summary from the MIS report (Strand and Sanchez 2009) is listed here.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Fox Sparrow Trend. The SNF Motorized Travel Management Project will directly, indirectly and cumulatively affect between 13,788 acres of shrubland habitat (lowest) under the Proposed Action Alternative and 32,961 acres (highest) under the No Action Alternative. Based on the acres affected, which ranges from 2 percent to 4 percent of the total Sierra Nevada-wide acreage, the SNF Motorized Travel Management Project will not change the existing bioregional trend in the habitat, nor will it lead to a change in the distribution of fox sparrows across the Sierra Nevada bioregion.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Mountain Quail Trend: The SNF MTM Project will directly, indirectly and cumulatively affect between 21,839 acres of early seral coniferous forest habitat (lowest) under the Proposed Action alternative and 41,091 acres (highest) under the No Action Alternative. The acres affected range from 4 percent to 8 percent of the total Sierra Nevada-wide acreage. Motorized travel on the SNF has slightly decreased the existing bioregional trend in early seral coniferous forest habitat and has likely created a slight decrease in the distribution of mountain quail across the Sierra Nevada bioregion. Implementation and enforcement of the action alternatives would slightly improve the bioregional trend in the habitat and increase distribution of the mountain quail across the bioregion, with Alternative 2 being the best, then 4, 3 and 5.

The SNF MTM Project will directly, indirectly and cumulatively affect between 143,462 acres of mid seral coniferous forest habitat (lowest) under the Proposed Action Alternative and 269,761 acres (highest) under the No Action Alternative. The acres affected range from 5 percent to 10 percent of the total Sierra Nevada-wide acreage. Motorized travel on the SNF has decreased the existing bioregional trend in mid seral coniferous forest habitat and has likely created a slight decrease in the distribution of mountain quail across the Sierra Nevada bioregion. Implementation and enforcement of any of the alternatives would improve the bioregional trend in the habitat and increase distribution of the mountain quail across the bioregion. The improvement would only be slight under the No Action Alternative, but would increase under the action alternatives, with Alternative 2 being the best, then 4, 5 and 3.

Townsend's big-eared bat – Affected Environment

The Townsend's big-eared bat requires roosting habitat that is inaccessible to humans, because individuals roost on walls or ceilings, often near entrances. They rarely seek shelter in crevices as many other bat species do. If undisturbed, individuals will frequently roost less than three meters off the ground, and have been found in air pockets under boulders on cave floors. Populations of this species are threatened by habitat loss, vandalism, and disturbance by cave explorers at maternity and hibernation roosts. Human disturbance can cause permanent abandonment of roost sites. Within a few years of publication of a guidebook to the caves of Colorado, human visitation to one particular cave increased so much that the colony of C.townsendii found there eventually disappeared (Hicks 1984).

Their most typical habitat is arid western desert scrub and pine forest regions. In terms of dominant vegetation type, this bat occurs in a variety of habitats, including desert scrub, sagebrush, chaparral, deciduous and coniferous forests. Their distribution is strongly associated with the availability of caves or cave-like roosting habitat such as old mines. They may also use hollow trees. In general, the most serious factor leading to population declines in bats is loss and/or disturbance of suitable roosting habitat, and Townsend's big-eared bats appear to be among the most dependent of all North American bats on abandoned or inactive mines. Concentrations also occur in areas with substantial surface exposures of cavity forming rock such as limestone, but such areas are rare in the West. The species is occasionally found in old, mostly abandoned buildings and other human made cave-like structures, but these areas are mostly used at night while the animals are foraging. The bats are inactive during the day, and stay mostly in caves or mine tunnels.

These bats require habitat for day roosts, night roosts, and hibernation roosts. The most significant roosts, which have the largest aggregations and are most critical to the survival of populations, are the winter hibernacula (both sexes), and the summer maternity roosts (entirely adult females and their young). Additionally, there are other summer roosts: Those used in the day time by males and non-reproductive females (usually containing no more than a few animals per roost), night roosts (generally at a different site than the day roost), used by both sexes as a place to rest and digest food during the night, and interim roosts (sites used in the spring before the young are born and in the fall before moving to hibernating sites.

The big-eared bat feeds on moths, caddisflies, and other insects, detecting them by echolocation, and capturing them in flight. They forage frequently over water, and also pick insects from leaves. This bat is particularly maneuverable in flight, varying from swift darting movements to slow deliberate and hovering moves. This makes the species difficult to capture, which is one reason why so little is known about locations in Colorado and other states. Townsend's big-eared bats are late flyers. They emerge from the roost primarily after dark, an average of 45.5 minutes after sunset, and forage until the early morning hours.

Townsend's big-eared bat – Environmental Consequences

Alternative 1 – No Action

Effects Due to Continued Cross-country Travel: Cross-country travel would not be prohibited under this alternative. Therefore, it is assumed the route proliferation would continue over the short and long term and the effects would be similar to those discussed under adding routes to the NFTS. Under this alternative the snag associated species would have habitat degraded because cross-country travel would continue and not confined to particular routes.

If cross-country motorized use continued, it would be a direct effect to the species in this group because the public could potentially disturb habitat. It may allow access to roost sites yet undiscovered which could be subject to disturbance and potentially cause roost site abandonment.

While cross-country travel does not have significant effect upon use of green forest snag habitat, unauthorized routes and use areas associated with cross-country travel do. Use areas that are within the habitat and routes that are in or < ¼ mile from the habitat likely increase: (1) roosting and maternal sites disturbance; and/or (2) habitat avoidance. The period of greatest sensitivity occurs during nest building and incubation (Gotmark 1992 in Knight and Gutzwiller 1995) when the individual is more likely to abandon the site; it is thought it would be similar for bats roosting and maternal sites. Similar for bats, parental attentiveness may be disturbed; thereby, disrupting feeding patterns and increasing the chance that young may become stressed and/or predated upon.

Effects Due to Additions to the NFTS: There are no routes or use areas identified to add to the NFTS under this alternative; therefore, there will be no direct or indirect effects to the species or the habitat.

Effects Due to Changes to the Existing NFTS: Under this alternative, there are no proposed changes to the current season of use on NFTS roads plan. Closure conditions would not change; therefore, there would be no changes to potential direct and indirect effects to Townsends big-eared bat.

Alternative 2 – Proposed Action

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be permanently prohibited across the Forest under this alternative. Prohibition of cross-country travel would limit motor vehicle use to current NFTS roads. Technically, it would limit the proliferation of illegally created routes. Prohibition of cross-country motor vehicle travel would allow habitat to recover where degradation may be occurring.

Effects Due to Additions to the NFTS: The added facilities may cause noise disturbance to the species and would limit bat and bat prey activities. Erosion, land slides and run off can later roost site micro and macro conditions. Compaction of soils can limit amount of water infiltration to roost sites altering the hydrology (Howell et al 1996, Nagorsen and Brigham 1993 and Perkins 1994). It is important to have closure periods for wildlife because it helps with less energy being expended so they do not feel threatened to leave an area.

Effects Due to Changes to the Existing NFTS: For green forest snag habitat: (1) 338 miles of roads that impact the habitat would be closed year round (as opposed to the 145 currently closed). Less acres of habitat would be removed. As well, more routes within the habitat would likely be closed during the hibernation and maternal seasons of the bat since this alternative would close 17.8 vs. 8.3 miles or 53 percent more routes during this critical time period. Seasonal closures would decrease human-caused disturbance during these times. As shown in USDA 2001, the species has declined due to direct killing by people and because of abandonment of roosts caused by disturbance due to explorers and vandals.

Alternative 3

Effects Due to the Prohibition of Cross-country Travel: This alternative would prevent disturbance to the species within this group by prohibiting cross-country travel. In the long-term period (20 years), species habitat would be expected to recover from soil and vegetation impacts caused by unmanaged motorized travel, especially where unauthorized routes no longer receive motorized traffic especially if routes go by or adjacent to cave or mine areas.

Effects Due to Additions to the NFTS: Under this alternative, there would be no new routes or use areas proposed for addition to the NFTS; therefore, there would be no direct or indirect effect to cavity dependent species.

Effects Due to Changes to the Existing NFTS: Under this alternative, there would be no changes to the seasons of use; the only ones implemented are those that currently exist. There would be no changes; therefore, there would be no new direct or indirect effects to cave dependent species.

Alternative 4

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be prohibited in this alternative. Prohibited cross-country travel would limit the proliferation of illegally created routes. This would reduce the risk of direct and indirect effects to Townsends big-eared bats from motorized travel over the short and long term due to noise disturbance.

Effects Due to Additions to the NFTS: Twenty-seven miles of routes and 13 acres of use areas are added under this alternative; however a minimal amount would affect the Townsends big-eared bat for foraging habitat because they forage in riparian habitat and approximately .05 miles of routes are added in this habitat type (see riparian section). If any routes are added which lead to where caves or mines are located, that is where there is potential for disturbance to the species.

Effects Due to Changes to the Existing NFTS: For green forest snag habitat, this means that: (1) 290 miles of NFTS routes that impact the habitat would be closed year round. As well, more routes within the habitat would likely be closed during the reproductive season of the bats since this alternative would close 41.5 vs. 8.3 miles or 80 percent mores routes during this critical time period, which in turn if it is adjacent or near caves or mines it could be a disturbance to the bat.

Alternative 5

Effects Due to the Prohibition of Cross-country Travel: Cross-country travel would be prohibited in this alternative. Prohibited cross-country travel would limit the proliferation of illegally created routes near Townsends big-eared bat habitat which would reduce the risk of direct and indirect effects to bat habitat from motorized travel over the short and long term.

Effects Due to Additions to the NFTS: Forty-two miles of routes are added and 52 acres of use areas are added, under this alternative. The largest amount of habitat would be affected because the highest amount of routes and use areas would be added.

Effects Due to Changes to the Existing NFTS: For riparian habitat, which is the foraging habitat for the bat, the zones of influence would be significantly decreased on these routes and less acres of habitat would be taken out of effective use. As well, more routes within the habitat would likely be closed during the reproductive season of the bat. Seasonal closures would decrease human-caused disturbance to wildlife during this critical time.

Compliance with the Forest Plan (LRMP) and Other Direction

Table 205. Compliance with LRMP and Other Direction

			Complies with LRMP and Other Direction		
Guidance from 2004 Record of Decision for the Sierra Nevada Forest Plan Amendment (Framework)	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**	**Alt 5**
California Spotted owl and Northern Goshawk (Standard and Guideline 82)		x	x	x	x
Fisher and Marten (Standard and Guideline 87 and 89)		x	x	x	x
Riparian Habitat (Standard and Guideline 92)			x	x	x
Guidance from the 1991 SNF LRMP					
*Deer areas (winter range, population centers, holding areas)	x	x	x	x	x

Summary of Determinations for Threatened and Forest Service Sensitive Species:

It is my determination, under alternative 1, Travel Management may affect not likely to adversely affect the **Valley Elderberry Longhorn Beetle** because cross-country travel may disturb VELB habitat.

It is my determination, under alternatives 2-5, Travel Management will have **no effect** to the **Valley Elderberry Longhorn Beetle** because the Fish and Wildlife Design criteria will be implemented. The habitat will not be disturbed because at this time there are no routes designated in the VELB habitat.

It is my determination, under all alternatives except Alternative 1, Travel Management will have **no effect** to the **bald eagle** because the Fish and Wildlife Design criteria will be implemented and there are no routes in bald eagle habitat. Under alternative 1, it is my determination the Travel Management DEIS **may impact individuals, but is not likely to result in a trend toward Federal listing or loss of viability for bald eagles** because there is a route designated within 1/8 mile of a bald eagle nest.

It is my determination, under all alternatives; Travel Management **may impact individuals, but is not likely to result in a trend toward Federal listing or loss of viability for the California spotted owls and Northern goshawks** because habitat will be impacted by noise disturbance from motorized use. There is a minimal difference between road densities; however, when you look at the miles of road being added there would be an effect to the amount of habitat used by the species. The seasonal closures are a benefit to wildlife because it protects habitat for the species.

It is my determination, under all alternatives; Travel Management **may impact individuals, but is not likely to result in a trend toward Federal listing or loss of viability for the great gray owl** because habitat will be impacted by vegetation being crushed or trampled along meadows. Although, there are no PACs that will be effected under alternative 3 and 4 there is still habitat that may be affected.

It is my determination, under alternatives 1 and 5, Travel Management **may impact individuals but not likely to cause a trend to a Federal listing or a loss of viability for the willow flycatcher** because there is one routes adjacent to an occupied meadow.

It is my determination, under alternatives 2-4, Travel Management will have **no impact for the willow flycatcher** because there are no routes adjacent to an occupied meadows or suitable habitat.

It is my determination, under all alternatives, Travel Management **may impact individuals, but is not likely to result in a trend toward Federal listing or loss of viability** for all three bat species, Western red bat, Pallid bat, Townsends big-eared bat, because habitat will be effected by noise disturbance or could be trampled or crushed. All species benefit from seasonal closures because it may protect habitat by minimizing disturbance.

It is my determination, under all alternatives; Travel Management **may impact individuals, but is not likely to result in a trend toward Federal listing or loss of viability for the marten** because habitat will be impacted by noise disturbance from motorized use. There is a minimal difference between road densities; however, when you look at the miles of road being added there would be an effect to the amount of habitat used by the species. If there is an increase in seasonal closures there would be a benefit to the marten because more habitat would be protected during critical foraging and denning periods.

It is my determination, under all alternatives; Travel Management **may impact individuals, but is not likely to result in a trend toward Federal listing or loss of viability for the Pacific fisher** because habitat will be impacted by noise disturbance from motorized use. There is a minimal difference between road densities; however, when you look at the miles of road being added there would be an effect to the amount of habitat used by the species. If there is an increase in seasonal closures there would be a benefit to the fisher because more habitat would be protected during critical foraging and denning periods.

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