Terrestrial and Aquatic Wildlife

Biological Evaluation

Motorized Travel Management Plan

Stanislaus National Forest

Stanislaus National Forest
Pacific Southwest Region
USDA Forest Service
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1. INTRODUCTION

The purpose of this document is to evaluate and disclose the effects of the Stanislaus National Forest (STF) Travel Management Plan to threatened, endangered, and sensitive wildlife species; pursuant to the Endangered Species Act (ESA) of 1973, the National Forest Management Act (1976), Forest Service Manual (FSM) 2670.32, the Stanislaus National Forest Land and Resource Management Plan (USDA 1991), and the Sierra Nevada Forest Plan Amendment Final Supplemental Environmental Impact Statement (FSEIS) (USDA 2004). The Stanislaus National Forest "Forest Plan Direction" presents the current Forest Plan management direction, based on the original Forest Plan as modified through the Forest Plan appeals and amendment processes (USDA 2005).

On April 4, 2008, the United States Fish and Wildlife Service (USFWS) website (http://www.fws.gov/sacramento/es/spp_lists/NFActionPage.cfm) was accessed to obtain a list of threatened and endangered species that may occur on the STF (Table 1). The Regional Forester's list of Sensitive Species for Region 5 identifies the following sensitive species that may occur on the Stanislaus National Forest (Table 1) (USDA 2007a). For detailed descriptions of these species and their habitat preferences, the reader is referred to the SNFPA FEIS (USDA 2001).

Table 1. Endangered, Threatened, and Sensitive species considered in this analysis.

Common Name	Scientific Name	Status[1]	Addressed in this BA/BE
Invertebrates			
Valley Elderberry Longhorn Beetle	*Desmocerus californicus dimorphus*	T	X
Fish			
Delta Smelt	*Hypomesus transpacificus*	T	
Lahontan Cutthroat Trout	*Oncorhynchus clarki henshawi*	T	X
Central Valley Steelhead	*Oncorhynchus mykiss*	T	
Hardhead	*Mylopharodon conocephalus*	S	
Reptiles and Amphibians			
California Red-legged Frog	*Rana aurora draytonii*	T	X
California Tiger Salamander	*Ambystoma californiense*	T	
Relictual Slender (Hell Hollow) Salamander	*Batrachoseps relictus*	S	X
Limestone Salamander	*Hydromantes brunus*	S	
Yosemite Toad	*Bufo canorus*	S	X
Foothill Yellow-legged Frog	*Rana boylii*	S	X
Mountain Yellow-legged Frog	*Rana muscosa*	S	X
Western Pond Turtle	*Clemmys marmorata*	S	X
Birds			
Bald Eagle	*Haliaeetus leucocephalus*	S	X
California Spotted Owl	*Srix occidentalis occidentalis*	S, MIS	X
Great Gray Owl	*Strix nebulosa*	S	X
Northern Goshawk	*Accipiter gentilis*	S	X
Swainson's Hawk	*Buteo swainsoni*	S	
Peregrine Falcon	*Falco peregrinus*	S	X
Willow Flycatcher	*Epidonax traillii*	S	X
Mammals			
American Marten	*Martes americana*	S, MIS	X
Pacific Fisher	*Martes pennanti pacifica*	S	X

California Wolverine	*Gulo gulo luteus*	S	X
Sierra Nevada Red Fox	*Vulpes vulpes necator*	S	X
Townsend's Big-eared Bat	*Corynorhinus townsendii*	S	X
Western Red Bat	*Lasiurus blossevillii*	S	X
Pallid Bat	*Antrozous pallidus*	S	X

[1] T = Threatened, S = Sensitive, MIS = Management Indicator Species

The delta smelt, hardhead, central valley steelhead, California tiger salamander, limestone salamander, and Swainson's hawk were considered in this document but are excluded from further analysis because these species are not known to occur within the analysis area and the project alternatives are not expected to have any adverse impacts on these species.

2. CURRENT MANAGEMENT DIRECTION

General management direction for sensitive species on the STF can be found in the following documents, available at the Stanislaus National Forest Supervisor's Office:

Forest Service Manual and Handbooks (FSM/H 2670)

- As part of the National Environmental Policy Act process, review programs and activities, through a biological evaluation, to determine their potential effect on sensitive species.
- Avoid or minimize impacts to species whose viability has been identified as a concern.
- If impacts cannot be avoided, analyze the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole.
- Establish management objectives in cooperation with the States when a project on National Forest System lands may have a significant effect on sensitive species population numbers or distribution. Establish objectives for Federal candidate species, in cooperation with the FWS and the States.

National Forest Management Act (NFMA), and implementing regulations (CFR 219.19)

- Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area.

Stanislaus National Forest Land and Resource Management Plan (LRMP), as amended in January 2001 and January 2004.

- Standards and guidelines from the LRMP and the Sierra Nevada Forest Plan Amendment Record of Decision (ROD) that are pertinent to this project are summarized for each species below.

Furthermore, a detailed analysis of project alternatives compliance with the Riparian Conservation Objectives (RCO) is provided in the project record of the STF Travel Management DEIS and is herein incorporated by reference.

3. PROJECT DESCRIPTION

Alternative 1 (Proposed Action)

This is the Proposed Action, as described in the Notice of Intent, with corrections based on updated data and map information and refinements responding to the administration, motorized recreation, private property, recreation and resource issues raised during scoping. These corrections and refinements provide additional motorized recreation opportunities (including those accessing dispersed recreation activities thereby replacing the need for travel corridors), reduce conflicts and provide additional resource protection.

Cross Country Travel: Motorized vehicle travel off NFTS routes by the public would be prohibited except as allowed by permit or other authorization. Parking is allowed within one vehicle length off of NFTS routes.

Changes to the existing NFTS: Vehicle type changes would occur on 623.28 miles of NFTS roads with all existing seasonal closures replaced by winter closures of all routes based on elevation and wet weather closures on native surfaced routes.

Vehicle Type

Table 2 shows vehicle type changes would occur on 623.28 miles of NFTS roads including: converting 63.06 miles of road to trail; opening 67.96 miles of closed roads; converting 5.42 miles of closed roads to administrative use only; closing 45.98 miles of open roads; converting 93.59 miles of roads from street legal only to all vehicles; and, converting 400.49 miles of roads from all vehicles to street legal only.

Table 2. Vehicle Type Changes: Alternative 1

From↓	Vehicle Type Changes To↓ (miles)								Total
	ADM	ALL	ML1	SLO	T-ALL	T-ATV	T-MC	T-SLO	
ALL	27.37	0.00	15.94	400.49	0.30	0.00	1.98	7.56	453.65
ML1	5.42	12.57	0.00	2.17	26.43	1.94	1.58	23.27	73.38
SLO	2.66	93.59	0.00	0.00	0.00	0.00	0.00	0.00	96.26
Total	**35.46**	**106.16**	**15.94**	**402.66**	**26.73**	**1.94**	**3.56**	**30.83**	**623.28**

ADM and ML1 are closed to motorized use by the public

Season of Use

Except as allowed by permit or other authorization (i.e. routes identified for wheeled over snow use), **native** surface and **non-native** (aggregate and paved) surfaced NFTS motorized routes are open to motorized use only during the season of use shown below, unless specifically prohibited.

1. Lower Elevations — Open all year
2. Middle Elevations — Open April 1 – November 30
3. Upper Elevations — Open May 15 – November 30

Wet Weather Closures: During the season of use, all **native** surface routes are subject to wet weather closure when 1 inch of rainfall occurs in a 24 hour period and allowing for 72 hours of drying.

Wheeled Over Snow Use

Wheeled over snow use would be prohibited except:

1. on the routes listed in Table 3; or,
2. where allowed by permit or other authorization.

Table 3. Wheeled Over Snow Routes

Route	District	Miles
3N01	Mi-Wok	20.0
4N12	Summit	19.0
7N05	Calaveras	1.1
7N09	Calaveras	2.1
7N17	Calaveras	2.8
7N23	Calaveras	4.4
8N02	Calaveras	1.4
8N12	Calaveras	0.6

Total	**51.4**

Additions to the NFTS: 157.39 miles of unauthorized routes are added to the NFTS as trails.

Alternative 2 (No Action)

The No Action Alternative provides a baseline for comparing the other alternatives. Under the No Action alternative, current management plans would continue to guide management of the project area. This alternative would **not** change the use of any NFTS roads and would **not** add any miles of NFTS motorized trails. Under this alternative the agency would take no affirmative action (no change from current management or direction) and cross country travel with continued use of unauthorized routes would occur. It would include only existing seasonal closures and would **not** include any restrictions on motorized dispersed recreation access.

No changes would be made to the current NFTS and no cross country travel prohibition would be put into place. The Travel Management Rule would not be implemented, and no MVUM would be produced. Motor vehicle travel by the public would not be limited to NFTS routes. Unauthorized routes would continue to have no status or authorization as NFTS facilities.

Cross Country Travel: Motorized vehicle travel off NFTS routes by the public would continue except where prohibited by existing Forest Orders.

Changes to the existing NFTS: No changes are made to the NFTS (see Table 4) or existing seasonal closures.

Table 4. Existing NFTS Public Motorized Opportunities (Baseline)

1. **Motorized Opportunity**				2. **Miles**
3. **NFTS**		4. **Vehicle Type**		
5.	Road	6.	All Vehicles (ALL)	7. 1734.91
8.	Road	9.	Street Legal Only (SLO)	10. 429.17
11.	Trail	12.	All Vehicles (ALL)	13. 61.35
14.	Trail	15.	All Terrain Vehicle (ATV)	16. 21.00
17.	Trail	18.	Motorcycle (MC)	19. 12.94
20. **Total Motorized**				21. **2259.37**

Additions to the NFTS: No unauthorized routes are added to the NFTS.

Alternative 3 (Cross Country Prohibited)

Alternative 3 responds to the administration and resource issues by prohibiting cross country travel without adding any new facilities to the NFTS. This alternative also provides a baseline for comparing the impacts of other alternatives that propose changes to the NFTS in the form of new facilities (roads and trails). None of the currently unauthorized routes would be added to the National Forest System under this alternative.

Alternative 3 would not change the use of the NFTS and would not add any miles to the NFTS. Under this alternative the agency will prohibit cross country travel eliminating continued use of unauthorized routes. It would include seasonal closures on routes with existing seasonal closures and prohibit motorized access beyond existing NFTS routes.

Cross Country Travel: Motorized vehicle travel off NFTS routes by the public would be prohibited except as allowed by permit or other authorization. Parking is allowed within one vehicle length off of NFTS routes.

Changes to the existing NFTS: No changes are made to the NFTS (see Table 4) or existing seasonal closures.

Additions to the NFTS: No unauthorized routes are added to the NFTS.

Alternative 4 (Recreation)

Alternative 4 responds to the motorized recreation opportunities issue by providing additional routes and reducing restrictions. This alternative would maximize motorized recreation opportunities (including those accessing dispersed recreation activities thereby replacing the need for travel corridors).

Cross Country Travel: Motorized vehicle travel off NFTS routes by the public would be prohibited except as allowed by permit or other authorization. Parking is allowed within one vehicle length off of NFTS routes.

Changes to the existing NFTS: Vehicle type changes would occur on 371.32 miles of NFTS roads with all existing seasonal closures replaced by winter closures of native surfaced routes based on elevation and wet weather closures on native surfaced routes.

Vehicle Type

Table 5 shows vehicle type changes would occur on 371.32 miles of NFTS roads including: converting 99.86 miles of road to trail; opening 101.83 miles of closed roads; converting 2.47 miles of closed roads to administrative use only; closing 10.66 miles of open roads; converting 99.76 miles of roads from street legal only to all vehicles; and, converting 145.76 miles of roads from all vehicles to street legal only.

Table 5. Vehicle Type Changes: Alternative 4

From↓	Vehicle Type Changes To↓ (miles)								Total
	ADM	ALL	ML1	SLO	T-ALL	T-ATV	T-MC	T-SLO	
ALL	5.18	0.00	2.81	145.76	2.21	0.00	1.98	6.65	164.59
ML1	2.47	12.08	0.00	0.73	74.60	2.09	2.34	10.00	104.30
SLO	2.66	99.76	0.00	0.00	0.00	0.00	0.00	0.00	102.43
Total	**10.32**	**111.84**	**2.81**	**146.49**	**76.81**	**2.09**	**4.32**	**16.65**	**371.32**

ADM and **ML1** are closed to motorized use by the public

Season of Use

Non-native (aggregate and paved) surfaced NFTS motorized routes are open all year, unless specifically prohibited.

Except as allowed by permit or other authorization, **native** surface NFTS motorized routes are open to motorized use only during the season of use shown below, unless specifically prohibited.

1. Lower Elevations — Open all year
2. Middle Elevations — Open April 1 – December 31
3. Upper Elevations — Open April 1 – December 31

Wet Weather Closures: During the season of use, all **native** surface routes are subject to wet weather closure when 1 inch of rainfall occurs in a 24 hour period and allowing for 72 hours of drying.

Wheeled Over Snow Use

Wheeled over snow use would be prohibited except:

a. on the routes listed in Table 3; or,
b. where allowed by permit or other authorization.

Additions to the NFTS: 181.72 miles of unauthorized routes are added to the NFTS as trails.

Alternative 5 (Resources)

Alternative 5 responds to the administration, private property, recreation and resource issues by limiting additions to the NFTS and increasing restrictions that would reduce conflicts and provide additional resource protection. This alternative would limit motorized recreation opportunities (including those accessing dispersed recreation activities) by providing greater protection for forest resources.

Cross Country Travel: Motorized vehicle travel off NFTS roads and NFTS trails by the public would be prohibited except as allowed by permit or other authorization. Parking is allowed within one vehicle length off of NFTS routes.

Changes to the existing NFTS: Vehicle type changes would occur on 531.39 miles of NFTS roads with all existing seasonal closures replaced by winter closures of all routes based on elevation and wet weather closures on native surfaced routes.

Vehicle Type

Table 6 shows vehicle type changes would occur on 531.39 miles of NFTS roads including: converting 21.51 miles of road to trail; opening 11.66 miles of closed roads; converting 5.42 miles of closed roads to administrative use only; closing 59.03 miles of open roads; and, converting 441.10 miles of roads from all vehicles to street legal only.

Table 6. Vehicle Type Changes: Alternative 5

From↓	Vehicle Type Changes To↓ (miles)								Total
	ADM	ALL	ML1	SLO	T-ALL	T-ATV	T-MC	T-SLO	
ALL	27.37	0.00	28.99	441.10	5.77	0.00	1.69	6.71	511.64
ML1	5.42	2.88	0.00	1.44	5.52	1.82	0.00	0.00	17.08
SLO	2.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.66
Total	**35.46**	**2.88**	**28.99**	**442.55**	**11.29**	**1.82**	**1.69**	**6.71**	**531.39**

ADM and **ML1** are closed to motorized use by the public

Season of Use

Except as allowed by permit or other authorization, **native** surface and **non-native** (aggregate and paved) surfaced NFTS motorized routes are open to motorized use only during the season of use shown below, unless specifically prohibited.

1. Lower Elevations — Open all year
2. Middle Elevations — Open April 15 – November 15
3. Upper Elevations — Open May 15 – November 15

Wet Weather Closures: During the season of use, all **native** surface routes are subject to wet weather closure when 1 inch of rainfall occurs in a 24 hour period and allowing for 72 hours of drying.

Wheeled Over Snow Use

Wheeled over snow use would be prohibited except where allowed by permit or other authorization.

Additions to the NFTS: 31.51 miles of unauthorized routes are added to the NFTS as trails.

4. Assumptions

1. The Risk – Disturbance Hypothesis: Animals respond to non-lethal human disturbance similarly to how they respond to predation (Hediger 1934, cited in Walther 1969).
2. 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.
3. 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.
4. Habitat is already impacted in the short-term. In the long-term, habitat will remain the same on added trails, but will increase to at least some degree on non-added trails with ban of cross-country travel and subsequent passive restoration.
5. Without a prohibition on cross-country travel route proliferation would continue to occur.
6. Aquatic species spend all or significant portions of their life cycles either in or moving through riparian habitats.

5. EFFECTS OF THE PROJECT ALTERNATIVES

General Effects

The use of a variety of motorized wheeled vehicles has become an increasingly popular form of recreation on National Forest lands. As it has become more popular, vast improvements in technology have also been incorporated into the sport resulting in more powerful vehicles that are capable of cross-country travel in more areas. Large increases in the number of users and improved vehicles have resulted in the proliferation of routes throughout many National Forests, including the Stanislaus. Route proliferation and the use of motorized wheeled vehicles have a broad range of direct and indirect effects on terrestrial and aquatic wildlife. The direct and indirect effects of motorized use on wildlife can be placed in three general categories: 1) human-caused mortality, 2) changes in behavior, and 3) habitat modification (Gaines et al. 2003). These categories were further broken down into specific effects that were documented in the literature (Table 7). The project alternatives may result in these effects through three types of actions: 1) the prohibition of cross-country travel, 2) adding a motorized route that is currently unauthorized to the transportation system, or 3) changing the season or type of use associated with an existing route.

Table 7. Road and trail associated factors with documented effects on habitat or populations of wildlife species and the effected wildlife species group.

	Road and Trail Associated Factors	Effects of the Factors	Wildlife Group Affected
Changes in Human-Caused Mortality	Collisions	Mortality or injury from a motorized vehicle running over or hitting an animal.	Wide-ranging Carnivores Late-successional Riparian Ungulates
Changes in Behavior	Displacement or Avoidance	Spatial shifts in individuals or populations of animals away from human activities on or near roads or trails.	Wide-ranging Carnivores Late-successional Riparian Ungulates

	Disturbance at a Specific Location	Displacement of individual animals from a specific location that is being used for reproduction and rearing of young.	Wide-ranging Carnivores Late-successional Riparian Ungulates
	Physiological Response	Increase in heart rate or stress hormones (which may decrease survivorship or productivity) when near a road or trail.	Ungulates Late-successional
Habitat Modification	Habitat Loss and Fragmentation	Loss and resulting fragmentation of habitat due to the establishment or use of roads or trails and associated human activities.	Wide-ranging Carnivores Late-successional Riparian Ungulates Cavity Dependent
	Edge Effects	Changes to habitat microclimates associated with the edge induced by roads or trails.	Late-successional
	Snag or Down Log Reduction	Reduction in density of large snags and downed los owing to their removal near roads to remove hazards and as fuelwood.	Cavity Dependent Late-successional Riparian
	Route for Competitors and Predators	Providing access or greater hunting success for competitors or predators than would otherwise have existed.	Wide-ranging Carnivores Late-successional Riparian Cavity Dependent
	Movement Barrier	Interference with dispersal or other movements due to either the road itself or by human activities on or near roads or trails.	Wide-ranging Carnivores Late-successional Riparian Ungulates

Human-caused Mortality: Death or injury from a vehicle hitting or running over an animal is well documented and affects the vast majority of terrestrial species, though to varying degrees (Trombulak and Frissell 2000). In general, road mortality increases with traffic volume and speed, and road kill on native surface forest roads is generally not significant for large mammals (USDA 1998). Small mammals and herpetofauna (reptiles and amphibians) are more vulnerable because individuals are inconspicuous and slow-moving. Amphibians may be especially vulnerable to road mortality because their life histories often involve migration between wetland and upland habitats (Trombulak and Frissel 2000, USDA 1998). Raptors may also be vulnerable to collisions on forest roads due to their foraging behaviors, but the most substantial documented mortality has been along highways.

Changes in Behavior (displacement or avoidance, impacts on breeding behavior, and physiological impacts): Walther (1969) in Frid and Dill (2002) assumed that wildlife exhibit a predator avoidance response when they become non-lethally disturbed by humans. When a motorized vehicle or human triggers a predator avoidance response in an individual, it may directly or indirectly affect that individual's fitness. Direct effects of disturbance to an individual's fitness are commonly measured through increases in stress hormone levels. Significant increases in stress hormone levels have been found to reduce reproductive success of individuals of some species. The indirect effects of disturbance are commonly displayed through changes in an individual's time and energy budget. As a vehicle or human approaches an individual, the most obvious and common disturbance response is for that individual to avoid the threat and seek cover. After an individual exhibits the disturbance response, a period of time will elapse until that individual resumes pre-disturbance behavior. Since this change in an individual's time budget may result in less time feeding or resting (fitness-enhancing activities), the disturbance may result

in changes to the individual's energy budget and potentially impact their fitness. If an individual is repeatedly disturbed in an area, they may eventually avoid the area; essentially being displaced from the habitat.

Gaines et al. (2003) reviewed literature on road- and trail-associated effects upon wildlife and found that alteration of use of habitats in response to roads or road networks was the most common interaction reported. Fifty to sixty percent of the 29 focal species reviewed were impacted in this manner (Gaines et al. 2003). Studies have documented shifts in an animal's home range area, shifts in foraging patterns, and disturbance of nesting or breeding behaviors resulting from motorized road or trail use and associated increased human recreation activity facilitated by motorized access (Foppen and Reijnen 1994, Johnson et al. 2000, Rost and Bailey 1979). Recreation activities (hiking, camping, fishing, shooting, etc.) that are associated with the access provided by motorized routes, result in indirect disturbance and displacement effects that often exceed the direct influence of the roads and trails. Many species avoid areas in proximity to roads or trails, or exhibit flight behavior within a certain distance of route use, though studies documenting the magnitude and duration of behavioral responses are limited. Road usage by vehicles has a significant role in determining animal's road avoidance behavior. Black bear, for example, crossed roads with low traffic volume more frequently than roads with high traffic volume, and almost never crossed interstate highways (Brody and Pelton 1989). Perry and Overly (1977) documented displacement of deer up to 800 meters from major roads, and from 200 to 400 meters from secondary and primitive roads. Van Dyke et al. (1986) documented that mountain lions avoided improved native surface roads and surfaced roads, and selected home range areas with lower road densities than the study area average. Activities that create elevated sound levels or result in close visual proximity of human activities at sensitive locations (e.g., nest trees), have the potential to disrupt normal behavior patterns. Studies of the effects of human disturbance upon wildlife have revealed that the immediate postnatal period in mammals and the breeding period in birds are time periods when individuals are most vulnerable to disturbance. Intrusion-induced behaviors such as nest abandonment and decreased nest attentiveness have led to reduced reproduction and survival in species that are intolerant of intrusion (Knight and Gutzwiller 1995). Foppen and Reijnen (1994), for example, found that the reproductive success of forest bird species declined in areas fragmented by roads. Anthony and Isaacs (1989) found that the mean productivity of bald eagle nests was negatively correlated with their proximity to main logging roads, and the most recently used nests were located in areas farther from all types of roads and recreational facilities when compared to older nests in the same territory. Wasser et al. (1997) found that stress hormone levels were significantly higher in male northern spotted owls (but not females) when they were located less than 0.25 miles from a major logging road compared to spotted owls in areas greater than 0.25 miles from a major logging road. Chronic high levels of stress hormones may have negative consequences on reproduction or physical condition of birds, though these effects are not well understood.

Habitat Modification (habitat loss, fragmentation, edge effects, snag and down log reduction, routes for competitors, movement barriers)**:** Road and trail networks remove habitat but also have a broader effect than just the conversion of a small area of land to route surfaces. Andren (1994) suggested that as landscapes become fragmented, the combination of increasing isolation and decreasing patch size of suitable habitat is negatively synergistic, compounding the effects of simple habitat loss. In particular, species associated with old forest habitats may be impacted by such effects. One study determined that the total landscape area affected by roads was 2.5 to 3.5 times the actual area occupied by the road feature, assuming a 50 meter influence along the road's edge (Reed et al. 1996). A decrease in interior forest patch size results in habitat loss and greater distance between suitable interior forest patches for sensitive species like the California spotted owl and American marten. As roads and trails break up forest patches, this may increase nest predation and parasitism rates by species such as jays or cowbirds (Miller et al. 1998), or provide increased access for generalist competitors or predators, such as coyotes (Buskirk and Ruggiero 1994).

Additional habitat modification occurs as an indirect effect of managing roads or trails for public wheeled motor vehicle use. Trees posing a potential safety hazard ("hazard trees") are removed along roads. These trees are typically snags that are within a tree-height distance from the road. This safety policy results in a "snag free" zone of 200 to 300 feet from a road's edge, also affecting the recruitment of large down wood within this zone. Few hazard trees are typically removed along trails. Major highways are known to create movement barriers for a number of wildlife species, particularly wide-ranging carnivores and ungulates, and are suspected of being a major factor in the decline of some forest carnivores, such as fisher and marten (Brody and Pelton 1989, USDA 2001). The slower speed and lower traffic volume roads and trails that are being evaluated in the project Alternatives are less likely to create barriers to movement. However, the extent to which denser networks of roads and trails might result in barriers to movement for some wildlife species is unknown (USDA 2001).

The project alternatives may result in the above listed effects through five types of actions:

- The prohibition of cross-country travel;
- Adding facilities (presently unauthorized roads, trails, and/or areas) to the NFTS;
- Changing the type of use on an existing NFTS route;
- Changing the season of use on the NFTS;
- Implementation of mitigation measures.

Terrestrial Wildlife
Threatened and Endangered Species

Valley Elderberry Longhorn Beetle
Desmocerus californicus dimorphus

Species and Habitat Account

The valley elderberry longhorn beetle (beetle) occurs primarily in the lower Sacramento River and upper San Joaquin Valley, and their range extends as far north as Redding, south to Kern County and into the foothills on either side of the Valley (Barr 1991, USDI 1984). USFWS surveys resulted in locating the beetles in Sierra Nevada foothill river canyons as high as 3,000 feet in elevation (Ibid). Comprehensive surveys for these beetles or their habitat have not occurred on the STF, but numerous surveys have been completed for site specific analysis of other projects below 3000 feet in elevation.

General habitat for the beetle is considered moist valley oak woodlands and riparian areas, as well as upland river canyons (USDI 1984). The beetle is an herbivore that specializes on elderberry shrubs (*Sambucus mexicana* and *S. racemosa*). The majority of its life is spent as larvae inside elderberry stems. Individual beetles rely on the same plant throughout their life cycle, and because of its limited dispersal capability, they are considered to occur almost exclusively where its host plant occurs (Barr 1991). Elderberry shrubs are sparsely distributed in the analysis area, and thus provide limited suitable habitat for the beetle.

Management Direction

On August 8, 1980, the valley elderberry longhorn beetle (VELB) was listed as a threatened species (45 FR 52803). Critical habitat was also designated at this time, but does not occur on the STF. Project Design Criteria (PDC) for route designation were determined through a programmatic consultation with the USFWS to achieve "No Effect" or "May Affect Not Likely to Adversely Affect" determinations. PDC for VELB are:

- Staging areas are not within 100 feet of occupied VELB sites or suitable habitat of elderberry plants containing stems measuring 1.0 inches or greater in diameter at ground level.

- Routes or areas are not within 20 feet of occupied VELB sites or suitable habitat of elderberry plants containing stems measuring 1.0 inches or greater in diameter at ground level.

Direct & Indirect Effects

General - All Alternatives

The project alternatives could result in direct and indirect effects to the valley elderberry longhorn beetle by:

- Prohibiting cross-country travel off of the NFTS,
- Adding facilities to the NFTS,
- Changing the type of use on NFTS routes,
- Changing the season of use on NFTS routes,
- Implementing mitigation measures.

The project alternatives would not add any staging areas to the NFTS; therefore, routes are the only facility being added to the NFTS that may have adverse impacts to the VELB. These actions may have direct and indirect effects on these beetles through human-caused mortality and habitat modification.

Human-Caused Mortality:
Allowing motorized travel near occupied or suitable habitat may result in inadvertent crushing of beetles. Since all suitable habitat was not surveyed for occupancy, all suitable habitat is assumed occupied.

Habitat Modification: Allowing cross-country travel or authorizing routes less than 3000 feet in elevation would result in soil surface perturbation and soil compaction under the tread of the vehicle tires; potentially preventing the growth of elderberry plants.

Indicators

The following indicators were chosen to provide a relative measure of the direct and indirect effects to the VELB and to determine if the project alternatives would comply with USFWS PDC. Thresholds for one of these indicators were established by the USFWS PDC (see above).

- Miles of routes added to the NFTS under 3000 feet in elevation.
- Number of elderberry plants (with stems greater than 1 inch) observed in field surveys within 20 feet of routes added to the NFTS.

Alternative 1

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 suitable VELB habitat. This would reduce the risk of direct and indirect effects to the VELB from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes
This alternative would add approximately 9.69 miles of routes to the NFTS under 3000 feet in elevation (Table 8). Field surveys were completed on these routes during the spring/summer of 2008. Results from these surveys indicate that there would not be any routes added to the NFTS within 20 feet of suitable VELB habitat (Table 8). Therefore, there would not likely be any direct or indirect effects to the VELB.

Season of Use
Seasonal closures would primarily be implemented at higher elevations (as identified for each route in Appendix I of the STF Travel Management DEIS) within the project area and would not likely have any direct or indirect effects to the VELB.

Mitigation Measures
The types of mitigation measures that would be implemented under 3000 feet in elevation include: tread hardening, drain dips, fence/log/rock barriers, and hardened stream crossings. Implementation of these mitigation measures would include hand tool and machine work that would occur within the current trail tread of routes being added to the NFTS. Since there was not any suitable VELB habitat identified within 20 feet of any routes being added to the NFTS, the implementation of mitigation measures would not have any direct or indirect effects.

Table 8. Valley Elderberry Longhorn Beetle: Direct and Indirect Effects Indicators - Alternative 1

Alternative 1 - Valley Elderberry Longhorn Beetle - Direct and Indirect Effects Indicators	
Miles of routes added to the NFTS under 3000 feet in elevation	9.69
Number of elderberry plants (with stems greater than 1 inch) observed in field surveys within 20 feet of routes added to the NFTS.	0

Alternative 2
Cross-Country Travel
Cross-country travel would not be prohibited under this alternative. Therefore it is assumed that route proliferation would continue over the short and long-term and the effects would be similar to those discussed below for adding routes to the NFTS.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes
Although this alternative would not result in the addition of any miles of unauthorized routes to the NFTS, vehicles would be allowed to use all existing motorized trails because cross-country travel would not be prohibited. Therefore, it is assumed that wheeled motorized vehicles will continue to use all of the documented unauthorized routes previously identified and continue to create new routes over the long-term. Since all unauthorized routes within the project area have not been surveyed for the presence of suitable VELB habitat, it is assumed occupied. The use of these routes and the continued proliferation of new routes would likely result in disturbance to suitable VELB habitat and would not comply with USFWS PDC.

Season of Use
Seasonal closures that would be implemented under this alternative are only those that currently exist. Seasonal closures would not likely have any direct or indirect effects to the VELB.

Mitigation Measures
There would not be any mitigation measures implemented as part of this alternative.

Alternative 3
Cross-Country Travel
Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes within preferred marten habitat and near meadows. This would reduce the risk of direct and indirect effects to marten from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes
This alternative would not result in the addition of any motorized routes to the NFTS, nor would it change the type of use on any current NFTS routes.

Season of Use
Seasonal closures that would be implemented under this alternative are only those that currently exist. Seasonal closures would not likely have any direct or indirect effects to the VELB.

Mitigation Measures

There would not be any mitigation measures implemented as part of this alternative.

Alternative 4

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 suitable VELB habitat. This would reduce the risk of direct and indirect effects to the VELB from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes

This alternative would add approximately 10.22 miles of routes to the NFTS under 3000 feet in elevation (Table 9). Field surveys were completed on these routes during the spring/summer of 2008. Results from these surveys indicate that there would not be any routes added to the NFTS within 20 feet of suitable VELB habitat (Table 9). Therefore, there would not likely be any direct or indirect effects to the VELB.

Season of Use

Seasonal closures would primarily be implemented at higher elevations (as identified for each route in Appendix I of the STF Travel Management DEIS) within the project area and would not likely have any direct or indirect effects to the VELB.

Mitigation Measures

The effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 9. Valley Elderberry Longhorn Beetle: Direct and Indirect Effects Indicators - Alternative 4

Alternative 4 - Valley Elderberry Longhorn Beetle - Direct and Indirect Effects Indicators	
Miles of routes added to the NFTS under 3000 feet in elevation	10.22
Number of elderberry plants (with stems greater than 1 inch) observed in field surveys within 20 feet of routes added to the NFTS.	0

Alternative 5

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 suitable VELB habitat. This would reduce the risk of direct and indirect effects to the VELB from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes

This alternative would add approximately 2.38 miles of routes to the NFTS under 3000 feet in elevation (Table 10). Field surveys were completed on these routes during the spring/summer of 2008. Results from these surveys indicate that there would not be any routes added to the NFTS within 20 feet of suitable VELB habitat (Table 10). Therefore, there would not likely be any direct or indirect effects to the VELB.

Season of Use

Seasonal closures would primarily be implemented at higher elevations (as identified for each route in Appendix I of the STF Travel Management DEIS) within the project area and would not likely have any direct or indirect effects to the VELB.

Mitigation Measures

The effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 10. Valley Elderberry Longhorn Beetle: Direct and Indirect Effects Indicators - Alternative 5

Alternative 5 - Valley Elderberry Longhorn Beetle - Direct and Indirect Effects Indicators	
Miles of routes added to the NFTS under 3000 feet in elevation	2.38
Number of elderberry plants (with stems greater than 1 inch) observed in field surveys within 20 feet of routes added to the NFTS.	0

Cumulative Effects

Appendix B (STF Travel Management DEIS) provides a list and description of past, present, and reasonably foreseeable projects on the STF and on private lands within the forest boundary. Some, but not all of these activities will likely contribute to effects upon the VELB. Primary factors likely impacting VELB habitat within the project area include: (1) loss of suitable habitat from wildfire; (2) loss or modification of suitable habitat from fuels/vegetation treatments; and (3) livestock grazing.

Based on GIS analysis, 14 wildfires have burned at or below 3000 feet in elevation since 2000. Past timber harvest and more recent fuels reduction treatments have been completed at various locations throughout the Forest. A GIS analysis indicated that between 2000 and 2008, less than 1% of all land below 3000 feet within the project area were treated with vegetation/fuels thinning projects. Although these vegetation treatments may reduce the amount of suitable habitat, mitigation measures and project design criteria have been used to reduce or eliminate short-term adverse effects from these treatments. Vegetation/fuels reduction projects will continue to be one of the primary activities affecting suitable VELB habitat on the STF (Appendix B STF Travel Management DEIS). These projects will likely occur on an estimated 3,500 acres per year, based upon the acreage treated in 2006. Some, but not all of them may affect the VELB but will be implemented with mitigation measures designed to reduce the adverse effects. Furthermore, past, present and future thinning treatments will likely reduce the risk of stand replacing wildfire over the long-term; providing long-term beneficial effects.

The California Department of Forestry and Fire Protection currently lists approximately 2,365 acres of private land within the STF administrative boundary for which timber harvest plans have been submitted. The portion of these projects occurring near suitable VELB habitat has not been determined.

Livestock grazing occurs on 35 active grazing allotments on the STF, totaling approximately 792,042 acres of NFS and private lands. On the STF, the impacts of livestock grazing on riparian area habitats has been steadily decreasing as forage utilization levels are being reduced by stricter standards established by the Sierra Nevada Forest Plan Amendment.

Alternatives 1, 3, 4, and 5 would not have any adverse direct or indirect effects to the VELB; therefore, these alternatives would not contribute to the cumulative effects for this species. Since there would not be a prohibition on cross-country travel under Alternative 2, this alternative would likely result in additional direct and indirect effects to the VELB through human-caused mortality and habitat modification.

Determinations

Alternative 1

Cross-country travel would be prohibited, there would not be any staging areas added, and there was not any suitable VELB habitat identified within 20 feet of routes being added to the NFTS.

Therefore, this alternative would be consistent with USFWS PDC and it is my determination that it would have *"No Effect"* on the valley elderberry longhorn beetle.

Alternative 2

This alternative would not prohibit cross-country travel; therefore, all unauthorized routes would continue to be used within the project area. All unauthorized routes were not surveyed for suitable VELB habitat and it is likely that routes would continue to be proliferated near suitable over the long-term.

Therefore, this alternative would be inconsistent with USFWS PDC and it is my determination that it *"May affect, likely to adversely affect"* the valley elderberry longhorn beetle

Alternative 3
Cross-country travel would be prohibited and there would not be any motorized routes added to the NFTS in this alternative. Prohibiting cross-country travel would reduce potential impacts to suitable VELB habitat over the short and long-term.

Therefore, it is my determination that this alternative would have *"Fully Beneficial Affects"* on the valley elderberry longhorn beetle.

Alternative 4
Cross-country travel would be prohibited, there would not be any staging areas added, and there was not any suitable VELB habitat identified within 20 feet of routes being added to the NFTS.

Therefore, this alternative would be consistent with USFWS PDC and it is my determination that it would have *"No Effect"* on the valley elderberry longhorn beetle.

Alternative 5
Cross-country travel would be prohibited, there would not be any staging areas added, and there was not any suitable VELB habitat identified within 20 feet of routes being added to the NFTS.

Therefore, this alternative would be consistent with USFWS PDC and it is my determination that it would have *"No Effect"* on the valley elderberry longhorn beetle.

Sensitive Species
American Marten
Martes americana

Species and Habitat Account
The American marten is a wide-ranging member of the *Mustelidae* family. Marten are widely distributed throughout the coniferous habitats of North America and currently occupy much of their historic range in California (Kucera and Zielinski 1995). Incidental observations of marten have been recorded throughout the higher elevations of the STF. Marten are morphologically adapted to be mobile in deep snow, and typically inhabit higher elevations receiving snow depths greater than 23 centimeters per winter month (Krohn et al. 1997). Numerous mesocarnivore surveys have been completed on the STF with the use of baited camera stations and track plates. Results of these further indicate that marten use higher elevations within the project area. Marten were not found at survey stations below 5000 feet in elevation and the majority of them were above 7000 feet. Although the presence of marten has been documented within the project area, there are no known den sites on STF.

Martens typically prefer late seral coniferous forests above 5,000 feet in elevation that have moderate-to-high canopy closure interspersed with riparian areas and meadows (Freel 1991, Zeiner et al. 1990). These habitats typically contain an abundance of snags and downed logs needed to provide the course woody debris that is necessary for effective winter foraging (Sherburne and Bissonette 1994). Important habitat attributes are: vegetative diversity, with predominately mature forest; snags; dispersal cover; and large woody debris (Allen 1987). Martens selected stands with 40 to 60 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 and Powell 1994, Spencer et al. 1983). Although martens tend to spend the majority of their time in mature forests, meadows are important component of foraging habitat. Spencer et al. (1983) found that marten preferred areas within 60 meters of meadows and were rarely found further than 400 meters from a meadow. For the purposes of this analysis, preferred marten habitat on the STF has been mapped as: CWHR types PPN, SMC, WFR, RFR; classes 5 and 6; canopy closures M and D (USDA 2007b).

Management Direction

The American marten was identified by the Regional Forester as a Sensitive Species and Management Indicator Species (MIS) on the STF (USDA 2007a, USDA 2007b). The FSEIS amended the STF Forest Plan with updated guidelines for managing furbearers, including the marten (USDA 2004). The FSEIS removed the 1991 plan requirements for marten territories and the associated standards and guidelines. The Forest Plan Direction contains the following management direction associated with the proposed project for marten:

- Minimize old forest habitat fragmentation. Assess potential impacts of fragmentation on old forest associated species (particularly fisher and marten) in biological evaluations.
- Mitigate impacts where there is documented evidence of disturbance to the den site from existing recreation, off highway vehicle route, trail, and road uses (including road maintenance). Evaluate proposals for new roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb den sites.

Direct & Indirect Effects

General – All Alternatives

The project alternatives could result in direct and indirect effects to marten by:

- Prohibiting cross-country travel off of the NFTS,
- Adding facilities to the NFTS,
- Changing the type of use on NFTS routes,
- Changing the season of use on NFTS routes,
- Implementing mitigation measures.

These actions may have direct and indirect effects on marten through: human-caused mortality, changes in behavior, and habitat modification.

Human-Caused Mortality: Opening routes to public use would improve access to marten habitat. Improving access to these habitats may result in increased instances of collisions with vehicles. Collisions with vehicles have been identified as a potentially significant source of marten mortality (Buskirk and Ruggerio 1994, Ruggerio et al. 1994). Collisions typically occur along well maintained roadways that allow high rates of travel. Routes proposed for designation within the project alternatives are native surfaced routes that allow much slower rates of travel. These types of routes result in far fewer collisions than highways or paved routes.

Changes in Behavior: Types of changes in behavior that may result from the project alternatives include: displacement or avoidance or disturbance at a specific location. The use of motorized vehicles in marten habitat may result in disturbance to martens that are foraging or denning. Although Robitaille and Aubrey (2000) studying marten in an area of low road density and low traffic (primarily logging roads), found that marten use of habitat within 300 and 400 meters of roads was significantly less than habitat use 700 or 800 meters distance, Zielinski et al. (2008) found that marten spatial distribution, occurrence, and diurnal activity were not affected by OHV use in northern California. Therefore, it did not appear that within the study area OHV activity resulted in changes to the foraging behavior of martens. While there is little research disclosing the specific effects of disturbance to marten den sites, other forest carnivores have been shown to abandon the den site upon human disturbance (Copeland 1996). Wet meadows have been

shown to be particularly important foraging areas for marten (USDA 2001). Routes added to the NFTS near and through meadows may increase disturbance within the meadow, thereby reducing the meadows value as a foraging habitat for martens.

Habitat Modification: Roads and trails modify marten habitat by directly removing it or indirectly by reducing its quality. While simple habitat loss is the most obvious, roads and trails also reduce habitat quality through fragmentation. Since marten have been found to be sensitive to changes in overhead cover, clearings associated with routes may reduce habitat quality near routes for foraging and may reduce marten movement between habitats that are separated by routes (Buskirk and Powell 1994, Hargis et al. 1999).

Hazard tree removal along NFTS roads has the potential to reduce downed logs and suitable resting and denning sites for marten. Hazard tree removal is typically conducted along Maintenance Level 2, 3, 4, and 5 roads (not Maintenance Level 1 roads or trails). The project alternatives primarily propose actions on trails and maintenance level (ML) 1 roads. Limited actions that are proposed on ML2, 3, 4, or 5 roads within any of the project alternatives would result in a net reduction in miles of road which hazard trees may be removed along. Therefore, the minor amounts of impact that the project alternatives may have on future hazard tree removal would be beneficial to marten habitat.

Wet meadows have been shown to be particularly important foraging areas for marten (USDA 2001). Meadow habitat quality may be affected numerous different ways by motorized travel. The most obvious way motorized vehicles may impair meadow quality is through direct mechanical damage (rutting). Since soil typically has lower bulk density and can be more easily penetrated when it is wet, mechanical damage often occurs in meadows that are naturally wet, in dry meadows after significant rainfall, or immediately following the retreat of the snow at higher elevations. When roads or trails are created in meadows they may intercept surface and subsurface flow (Kattelmann 1996). When flows are intercepted and redirected, meadow drying occurs, resulting in changes to the fauna and flora associated with it.

Changing the faunal community within meadows may impact their value as foraging areas for marten. *Microtus* species have been noted as being important prey items to martens at all times of the year (Zielinski et al. 1983). Winter (1982) found that *Microtus* were associated with moist areas that had good grass cover. Therefore, slight shifts in meadow hydrology caused by motorized travel may impact suitable habitat for mictrotines; thereby, adversely affecting the marten prey source.

Indicators

Based upon the available literature, the following indicators were chosen to provide a relative measure of the direct and indirect effects to marten. 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 preferred marten habitat.
- Miles of MLI roads converted to trails within preferred marten habitat.
- Miles of routes added to the NFTS within meadows.
- Miles of ML1 roads converted to trails within meadows
- Existing density (mi/mi^2) of NFTS routes within preferred marten habitat (outside wilderness areas).
- Density (mi/mi^2) of NFTS routes within preferred marten habitat (outside wilderness areas) with proposed designated routes.
- Percentage of preferred marten habitat occurring within a 400 meter “zone of influence” of routes added to the NFTS or ML1 roads converted to trails.

Alternative 1

Cross-Country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes within preferred marten habitat and near meadows. This would reduce the risk of direct and indirect effects to martens from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 1, several analyses were completed (Table 11). Actions proposed in this alternative would not likely result in any human-caused mortality, but would likely increase disturbance to some marten within the project area. Although there are no documented den sites within the project area, it is assumed that they occur. Since den sites are specifically selected and there are ample suitable denning locations throughout the project area, the addition of these routes would not likely result in disturbance to den sites. Increases in disturbance to foraging martens may reduce some individual's fitness, but these impacts would not result in any population level impacts to the marten.

Actions proposed in this alternative would result in some indirect effect through habitat modification. The addition of routes to the NFTS within preferred marten habitat and near meadows would result in minor amounts of habitat fragmentation. Since the majority of these routes are narrow native surfaced routes they will only result in minor reductions in overhead cover and would not significantly reduce marten movement between habitat patches. Field surveys were completed on all routes that were proposed to be added to the NFTS within meadows. The purpose of the field surveys was to determine whether the route would have the potential to affect hydrology within the meadow. Field surveys indicated that the routes that were proposed to be added within meadows would not significantly alter their hydrology. Although this alternative would result in some indirect effects to marten through habitat modification, these impacts are minor and would not be extensive enough to result in impacts to marten populations within the project area.

Season of Use: Marten typically inhabit higher elevations with greater amounts of snow; therefore, preferred habitat primarily falls within Zone 2 and Zone 3 of the seasonal closures (as identified for each route in Appendix I of the STF Travel Management DEIS). Although the exact timing may vary, marten typically have their young in the spring. Therefore, these closures would reduce disturbance to denning and foraging martens. Furthermore, the closure of routes during the wet weather season reduces soil perturbation and would protect meadows from mechanical damage.

Mitigation Measures: The types of mitigation measures that would be implemented within preferred marten habitat include: tread hardening, drain dips, fence/log/rock barriers, and hardened stream crossings. Implementation of these mitigation measures would include hand tool and machine work that would result in short-term disturbance to individual marten within the project area. This amount of disturbance would not likely reduce any individual marten's fitness and would not result in any population level impacts within the project area.

Table 11. American Marten: Direct and Indirect Effects Indicators - Alternative 1

Alternative 1 - American Marten - Direct and Indirect Effects Indicators	
Miles of routes added to the NFTS within preferred marten habitat	27.63
Miles of ML1 roads converted to trails within preferred marten habitat	10.26
Miles of routes added to the NFTS within meadows	1.27
Miles of ML1 roads converted to trails within meadows	0.48

Existing density (mi/mi^2) of routes under STF jurisdiction within preferred marten habitat	2.48
Density (mi/mi^2) of routes under STF jurisdiction within preferred marten habitat with proposed designated routes (additional density)	2.6 (.12)
Percentage of preferred marten habitat occurring within a 400 meter "zone of influence" of routes added to the NFTS or ML1 roads converted to trails	11.39%

Alternative 2
Cross-Country Travel: Cross-country travel would not be prohibited under this alternative. Therefore it is assumed that route proliferation would continue over the short and long-term and the effects would be similar to those discussed below for adding routes to the NFTS.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: Although this alternative would not result in the addition of any miles of unauthorized routes to the NFTS, vehicles would be allowed to use all existing motorized trails because cross-country travel would be allowed. Therefore, it is assumed that wheeled motorized vehicles will continue to use all of the documented unauthorized routes previously identified and continue to create new routes. The use of these routes and the continued proliferation of new routes would result in increasing amounts of disturbance to marten and increased fragmentation/modification of their habitat. These effects would be similar to those discussed within Alternative 4 for the short-term, but would be exacerbated over the long-term by the continued proliferation of routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although any seasonal closures implemented within this alternative would reduce potential disturbance to marten, these seasonal closures would not adequately protect all meadows from mechanical damage that may occur since cross-country travel would be allowed. Therefore, it may be assumed that hydrology within some meadows may be affected and that it may result in impacts to marten prey base.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 3
Cross-Country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes within preferred marten habitat and near meadows. This would reduce the risk of direct and indirect effects to marten from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: This alternative would not result in the addition of any motorized routes to the NFTS, nor would it change the type of use on any current NFTS routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would reduce potential disturbance to marten.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 4
Cross-Country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes within preferred marten habitat and near meadows. This would reduce the risk of direct and indirect effects to martens from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 4, several analyses were completed (Table 12). Direct and indirect effects of the actions proposed in this alternative would be similar to those discussed in Alternative 1. Since there is a slight increase from Alternative 1 in the number of routes added to the system or converted to a trail within preferred marten habitat and within meadows, there would be a slight increase in the direct and indirect effects to marten within the project area. Although these increases would result in more individuals being impacted, these increases would not likely be significant enough to result in impacts to marten populations within the project area.

Season of Use: Marten typically inhabit higher elevations with greater amounts of snow; therefore, preferred habitat primarily falls within Zone 2 and Zone 3 of the seasonal closures (as identified for each route in Appendix I of the STF Travel Management DEIS). Although the exact timing may vary, marten typically have their young in the spring. Therefore, these closures would reduce disturbance to denning and foraging martens. Furthermore, the closure of routes during the wet weather season reduces soil perturbation and would protect meadows from mechanical damage.

Mitigation Measures: The effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 12. American Marten: Direct and Indirect Effects Indicators - Alternative 4

Alternative 4 - American Marten - Direct and Indirect Effects Indicators	
Miles of routes added to the NFTS within preferred marten habitat	33.17
Miles of ML1 roads converted to trails within preferred marten habitat	11.78
Miles of routes added to the NFTS within meadows	1.69
Miles of ML1 roads converted to trails within meadows	0.48
Existing density (mi/mi^2) of routes under STF jurisdiction within preferred marten habitat	2.48
Density (mi/mi^2) of routes under STF jurisdiction within preferred marten habitat with proposed designated routes (additional density)	2.63 (.15)
Percentage of preferred marten habitat occurring within a 400 meter "zone of influence" of routes added to the NFTS or ML1 roads converted to trails	12.75%

Alternative 5

Cross-Country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes within preferred marten habitat and near meadows. This would reduce the risk of direct and indirect effects to martens from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 5, several analyses were completed (Table 13). Direct and indirect effects of the actions proposed in this alternative would be similar to those discussed in Alternative 1. Since there is a significant decrease from Alternative 1 in the number of routes added to the system or converted to a trail within preferred marten habitat and within meadows, there would be a significant decrease in the direct and indirect effects to marten within the project area. Since these impacts would affect a very small percentage of marten

habitat (Table 13), these actions would likely impact some individuals but would not likely result in impacts to populations within the project area over the short or long-term.

Season of Use: Marten typically inhabit higher elevations with greater amounts of snow; therefore, preferred habitat primarily falls within Zone 2 and Zone 3 of the seasonal closures (as identified for each route in Appendix I of the STF Travel Management DEIS). Although the exact timing may vary, marten typically have their young in the spring. Therefore, these closures would reduce disturbance to denning and foraging martens. Furthermore, the closure of routes during the wet weather season reduces soil perturbation and would protect meadows from mechanical damage.

Mitigation Measures: The effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 13. American Marten: Direct and Indirect Effects Indicators - Alternative 5

Alternative 5 - American Marten - Direct and Indirect Effects Indicators	
Miles of routes added to the NFTS within preferred marten habitat	2.65
Miles of ML1 roads converted to trails within preferred marten habitat	1.03
Miles of routes added to the NFTS within meadows	0.20
Miles of ML1 roads converted to trails within meadows	0
Existing density (mi/mi^2) of routes under STF jurisdiction within preferred marten habitat	2.48
Density (mi/mi^2) of routes under STF jurisdiction within preferred marten habitat with proposed designated routes (additional density)	2.49 (.01)
Percentage of preferred marten habitat occurring within a 400 meter "zone of influence" of routes added to the NFTS or ML1 roads converted to trails	1.6%

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, USDA 2004). In this assessment, the following key risk factors were identified for marten in the Sierra Nevada: (1) habitat alternation, particularly the removal of overhead cover, large diameter trees, or coarse woody material; (2) livestock grazing and other activities that might reduce the availability of prey in meadows; and (3) the use of roads and associated human access. Appendix B (STF Travel Management DEIS) provides a list and description of past, present, and reasonably foreseeable vegetation and fuels management projects on NFS lands and private lands within the STF boundary. Some, but not all, of these activities have contributed to effects on marten and have the potential to impact marten in the near future.

On the STF, several activities have influenced these risk factors for marten. Past timber harvest and more recent fuels reduction treatments have reduced important habitat components in marten habitats. Between 2000 and 2008, vegetation/fuels thinning treatments on NFS lands have occurred within less than 5% of marten habitat. These vegetation treatments have reduced habitat quality for marten by reducing canopy cover, structural complexity, and coarse woody material within treated units. At the larger landscape scale, these treatments may affect the size and connectivity of patches of high quality habitat. Vegetation/fuels reduction projects will continue to be one of the primary activities affecting marten habitat on the STF (Appendix B STF Travel Management DEIS). These projects will likely occur on an estimated 3,500 acres per year, based upon the acreage treated in 2006. Some, but not all of them will affect marten habitat. Over

time, fuels treatments are expected to alter 20 to 30 percent of the landscape, with a resulting expectation that the amount of habitat removed by stand replacing wildfires will be reduced in response to these treatments (USDA 2004).

The California Department of Forestry and Fire Protection currently lists approximately 2,365 acres of private land within the STF administrative boundary for which timber harvest plans have been submitted. The portion of these projects occurring within the marten's range has not been determined. Timber harvest on private lands is generally more intensive and does not typically provide suitable habitat for marten.

Livestock grazing occurs on 35 active grazing allotments on the STF, totaling approximately 792,042 acres of NFS and private lands. In some meadows, livestock grazing has reduced the suitability of meadow vegetation for microtine rodents and other marten prey (USDA 2001). On the STF, the impacts of livestock grazing on meadows has been steadily decreasing as fewer allotments are grazed and as forage utilization levels are being reduced by stricter standards established by the Sierra Nevada Forest Plan Amendment. These past and present effects contribute to the effects of the project Alternatives upon meadow habitat and condition.

Recreation use has increased and is expected to continue to increase on the STF (see Recreation section Affected Environment), resulting in greater likelihood and magnitude of human disturbance to wildlife. OHV use has been increasing at an even more rapid pace than other forms of recreation, based upon State figures for OHV sales (see Recreation section). The project alternatives would contribute to these past and current conditions with added displacement from noise and human activity, and fragmentation of habitat. Because Alternative 2 does not prohibit cross-country travel, there is a high degree of uncertainty about future route proliferation and associated cumulative impacts upon marten. The action alternatives do not result in a loss of habitat (no route construction), but noise and traffic disturbance would influence habitat use and availability where marten may be present. This influence, combined with fuels treatments and increasing recreation activity, could affect marten and their habitat on the STF. In the future, there is approximately 5 miles of new trail construction that is proposed to be added to the NFTS as well as numerous short route segments for dispersed camping access. These trails are proposed to provide "connector routes" between existing NFTS routes and motorized access to historical dispersed camping opportunities.

Unauthorized motorized routes that are prohibited to motorized use may receive non-motorized use (hiking, mountain bicycling, equestrian). It is generally considered that non-motorized use would result in less disturbance to marten. The extent and magnitude of non-motorized use is unknown. However, it is expected that over time, unauthorized routes that are prohibited to motorized use will eventually become revegetated and recover either through active or passive restoration means.

Direct and indirect effects of the project alternatives, as described in the previous section, cumulatively contribute to each of the risk factors identified for marten. Because Alternative 2 does not prohibit cross-country travel, there is a high degree of uncertainty about future route proliferation and associated cumulative impacts upon marten. Alternative 3 would prohibit cross-country travel and would not add any routes to the NFTS, therefore the effects of this alternative would be beneficial. Alternatives 1, 4, and 5 contribute cumulatively to the disturbance and habitat alteration from fuels treatments and habitat alteration from livestock grazing in meadows. Alternatives 4, 1, and 5 would result in progressively lower risk to martens due to the amount of motorized routes being added to the system. These alternatives do not result in a loss of habitat (no route construction), but may influence marten habitat. This influence, combined with fuels treatment and livestock grazing effects upon marten habitat, could be substantial. IRAs and adjacent wilderness areas may become increasingly important as the cumulative effect of fuels treatment activities expand within other portions of marten habitat. Considering the proportion of marten habitat influenced by motorized routes and projections for future increases in recreation uses and OHV activity, the alternatives could result in cumulative impacts when combined with other factors affecting marten habitat (Zielinski et al. 2008). 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).

Determinations

Alternative 1

This alternative would result in increased amounts of disturbance and habitat fragmentation within the project area, but would be limited over the long-term since cross-country travel would be prohibited. Disturbance and habitat fragmentation resulting from this alternative would likely result in adverse impacts to individual marten. Marten are widespread throughout the project area, impacts from this alternative would be limited, and cross-country travel would be prohibited. Therefore, these effects would not likely result in any impacts to marten populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the American marten.

Alternative 2

Although this alternative would result in increased amounts of disturbance and habitat fragmentation within the project area, continued route proliferation would ultimately be limited by topography, vegetation, and wilderness areas. Disturbance resulting from this alternative would likely result in adverse impacts to some individual marten. Increased habitat fragmentation from route proliferation would likely result in impacts to individuals over the short-term and may result in minor impacts to populations within the project area over the long-term. Marten occupy much of their historic range in California, are widespread in the Sierra Nevada Mountains, and occupy higher elevations common within wilderness areas. Therefore, there are significant amounts of marten habitat that are available in areas that are inaccessible to motorized vehicles over the short and long-term. Therefore, population level impacts would be minor, limited within the project area, and would not threaten the long-term viability of the species.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the American marten.

Alternative 3

Cross-country travel would be prohibited and there would not be any motorized routes added to the NFTS in this alternative. Prohibiting cross-country travel would reduce future disturbance to individual martens and prevent further fragmentation of their habitat over the short and long-term.

Therefore, it is my determination that this alternative would have a "*Beneficial Impact*" on the American marten.

Alternative 4

This alternative would result in increased amounts of disturbance and habitat fragmentation within the project area, but would be limited over the long-term since cross-country travel would be prohibited. Disturbance and habitat fragmentation resulting from this alternative would likely result in adverse impacts to individual marten. Marten are widespread throughout the project area, impacts from this alternative would be limited, and cross-country travel would be prohibited. Therefore, these effects would not likely result in any impacts to marten populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the American marten.

Alternative 5

This alternative would result in increased amounts of disturbance and habitat fragmentation within the project area, but would be limited over the long-term since cross-country travel would be prohibited. Disturbance and habitat fragmentation resulting from this alternative would likely result in adverse impacts to individual marten. Marten are widespread throughout the project area, impacts from this alternative would be limited, and cross-country travel would be prohibited. Therefore, these effects would not likely result in any impacts to marten populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the American marten.

Pacific Fisher
Martes pennanti pacifica

Species and Habitat Account

The fisher is a wide-ranging forest mustelid that historically occurred throughout much of the Sierra Nevada. Currently, they occupy a very small portion of their historical range in California and are isolated in two remnant populations (Zielinski et al. 1995, Zielinski et al. 2004). One of these populations is located in the southern Sierras, currently south of the STF. Numerous mesocarnivore surveys have been completed on the STF with the use of baited camera stations and track plates, but there have been no recent detections or verified sightings of fisher on the STF.

The fisher typically occupies mature forests with relatively high canopy closure, significant amounts of downed woody debris and snags, and adequate habitat connectivity. Green et al. (submitted) provide detailed discussions and an overview of the existing literature pertaining to the Pacific fisher. Suitable habitat for the fisher is located throughout the Forest, but there are no known den sites on the STF. For the purposes of this analysis, preferred fisher habitat on the STF has been mapped as: CWHR types ASP, PPN, JPN, MHC; classes 4, 5 and 6; canopy closures M and D.

Management Direction

The Pacific fisher was identified by the Regional Forester as a Sensitive Species on the STF (USDA 2007a). In addition, in 2004, the USFWS found that the west coast population of fisher warranted protection under the Endangered Species Act, but that listing this distinct population was precluded by higher priorities. The FSEIS amended the STF Forest Plan with updated guidelines for managing furbearers, including the fisher (USDA 2004). The FSEIS removed the 1991 plan requirements for marten territories and the associated standards and guidelines. The Forest Plan Direction contains the following management direction associated with the proposed project for fisher:

- Minimize old forest habitat fragmentation. Assess potential impacts of fragmentation on old forest associated species (particularly fisher and marten) in biological evaluations.
- Mitigate impacts where there is documented evidence of disturbance to the den site from existing recreation, off highway vehicle route, trail, and road uses (including road maintenance). Evaluate proposals for new roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb den sites.

Direct & Indirect Effects

General - All Alternatives

The project alternatives could result in direct and indirect effects to fisher by:

- Prohibiting cross-country travel off of the NFTS,
- Adding facilities to the NFTS,
- Changing the type of use on NFTS routes,

- Changing the season of use on NFTS routes,
- Implementing mitigation measures.

These actions may have direct and indirect effects on fisher through: human-caused mortality, changes in behavior, and habitat modification.

Human-Caused Mortality: Based upon a review of the literature, fisher were found to likely be affected by the same road and motorized trail-associated direct effects as marten. Please see above discussion for marten.

Changes in Behavior: Based upon a review of the literature, fisher were found to likely be affected by the same road and motorized trail-associated direct effects as marten. Please see above discussion for marten.

Habitat Modification: Roads and trails modify fisher habitat by directly removing it or indirectly by reducing its quality. While simple habitat loss is the most obvious, roads and trails also reduce habitat quality through fragmentation. Since fisher have been found to be sensitive to changes in overhead cover, clearings associated with routes may reduce habitat quality near routes for foraging and may reduce fisher movement between habitats that are separated by routes (Buskirk and Powell 1994, Hargis et al. 1999).

Hazard tree removal along NFTS roads has the potential to reduce downed logs and suitable resting and denning sites for fisher. Hazard tree removal is typically conducted along Maintenance Level 2, 3, 4, and 5 roads (not Maintenance Level 1 roads or trails). The project alternatives primarily propose actions on trails and maintenance level (ML) 1 roads. Limited actions that are proposed on ML2, 3, 4, or 5 roads within any of the project alternatives would result in a net reduction in miles of road which hazard trees may be removed along. Therefore, the minor amounts of impact that the project alternatives may have on future hazard tree removal would be beneficial to marten habitat.

Indicators

Based upon the available literature, the following indicators were chosen to provide a relative measure of the direct and indirect effects to fisher. 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 preferred fisher habitat.
- Miles of MLI roads converted to trails within preferred fisher habitat.
- Existing density (mi/mi^2) of NFTS routes within preferred fisher habitat.
- Density (mi/mi^2) of NFTS routes within preferred fisher habitat with proposed designated routes.

Alternative 1

Cross-Country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes within preferred fisher habitat. This would reduce the risk of direct and indirect effects to fisher from motorized travel over the long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 1, several analyses were completed (Table 14). Actions proposed in this alternative would not likely result in any human-caused mortality, but would likely increase disturbance to some fisher within the project area over the long-term (if re-established). Since fisher are not known to currently occupy the STF, there are no

documented fisher den sites within the project area. Therefore, this alternative would not have the potential to disturb fisher den sites. Potential increases in disturbance to foraging fisher may reduce some individual's fitness over the long-term (if re-established), but these impacts would not likely result in any population level impacts.

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.

Season of Use: Preferred fisher habitat is primarily located throughout mid-elevations within the project area. Therefore, motorized use would be seasonally restricted in approximately 50% of preferred fisher habitat. These closures (as identified for each route in Appendix I of the STF Travel Management DEIS) would reduce disturbance to foraging fisher over the long-term (if re-established).

Mitigation Measures: The types of mitigation measures that would be implemented within preferred fisher habitat include: tread hardening, drain dips, fence/log/rock barriers, and hardened stream crossings. Implementation of these mitigation measures would include hand tool and machine work that would result in short-term disturbance to individual fisher within the project area (if re-established). This amount of disturbance would not likely reduce any individual fisher's fitness and would not result in any population level impacts within the project area.

Table 14. Pacific Fisher: Direct and Indirect Effects Indicators - Alternative 1

Alternative 1 - Pacific Fisher - Direct and Indirect Effects Indicators	
Miles of routes added to the NFTS within preferred fisher habitat	22.13
Miles of ML1 roads converted to trails within preferred fisher habitat	6.28
Existing density (mi/mi2) of routes under STF jurisdiction within preferred fisher habitat	1.58
Density (mi/mi2) of routes under STF jurisdiction within preferred fisher habitat with proposed designated routes (additional density)	1.69 (0.11)

Alternative 2

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

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: Although this alternative would not result in the addition of any miles of unauthorized routes to the NFTS, vehicles would be allowed to use all existing motorized trails because cross-country travel would be allowed. Therefore, it is assumed that wheeled motorized vehicles will continue to use all of the documented unauthorized routes previously identified and continue to create new routes. The use of these routes and the continued proliferation of new routes would result in increasing amounts of disturbance to fisher (if re-established) and increased fragmentation/modification of their habitat. These effects would be similar to those discussed within Alternative 4 for the short-term, but would be exacerbated over the long-term by the continued proliferation of routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would reduce potential disturbance to fisher (if re-established).

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 3
Cross-Country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes within preferred fisher habitat. This would reduce the risk of direct and indirect effects to fisher from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: This alternative would not result in the addition of any motorized routes to the NFTS, nor would it change the type of use on any current NFTS routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would reduce potential disturbance to fisher (if re-established).

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 4
Cross-Country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes within preferred fisher habitat. This would reduce the risk of direct and indirect effects to fisher from motorized travel over the long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 4, several analyses were completed (Table 15). Direct and indirect effects of the actions proposed in this alternative would be similar to those discussed in Alternative 1. Since there is a slight increase from Alternative 1 in the number of routes added to the system or converted to a trail within preferred fisher habitat, there would be a slight increase in the direct (if re-established) and indirect effects to fisher within the project area. Although these increases would result in more individuals being impacted, these increases would not likely be significant enough to result in impacts to fisher populations within the project area.

Season of Use: Preferred fisher habitat is primarily located throughout mid-elevations within the project area. Therefore, motorized use would be seasonally restricted in approximately 50% of preferred fisher habitat. These closures (as identified for each route in Appendix I of the STF Travel Management DEIS) would reduce disturbance to foraging fisher over the long-term (if re-established).

Mitigation Measures: The effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 15. Pacific Fisher: Direct and Indirect Effects Indicators - Alternative 4

Alternative 4 - Pacific Fisher - Direct and Indirect Effects Indicators	
Miles of routes added to the NFTS within preferred fisher habitat	25.43
Miles of ML1 roads converted to trails within fisher habitat	11.15
Existing density (mi/mi2) of routes under STF jurisdiction within preferred fisher habitat	1.58

Density (mi/mi2) of routes under STF jurisdiction within preferred fisher habitat with proposed designated routes (additional density)	1.70 (0.12)

Alternative 5

Cross-Country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes within preferred fisher habitat. This would reduce the risk of direct and indirect effects to fisher from motorized travel over the long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 5, several analyses were completed (Table 16). Direct and indirect effects of the actions proposed in this alternative would be similar to those discussed in Alternative 1. Since there is a significant decrease from Alternative 1 in the number of routes added to the system or converted to a trail within preferred fisher habitat, there would be a significant decrease in the direct (if re-established) and indirect effects to fisher within the project area. Since these impacts would affect a very small percentage of fisher habitat (Table 16), these actions would likely impact some individuals but would not likely result in impacts to populations within the project area over the short or long-term.

Season of Use: Preferred fisher habitat is primarily located throughout mid-elevations within the project area. Therefore, motorized use would be seasonally restricted in approximately 50% of preferred fisher habitat. These closures (as identified for each route in Appendix I of the STF Travel Management DEIS) would reduce disturbance to foraging fisher over the long-term (if re-established).

Mitigation Measures: The effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 16. Pacific Fisher: Direct and Indirect Effects Indicators - Alternative 5

Alternative 5 - Pacific Fisher - Direct and Indirect Effects Indicators	
Miles of routes added to the NFTS within preferred fisher habitat	4.27
Miles of ML1 roads converted to trails within fisher habitat	0.16
Existing density (mi/mi2) of routes under STF jurisdiction within preferred fisher habitat	1.58
Density (mi/mi2) of routes under STF jurisdiction within preferred fisher habitat with proposed designated routes (additional density)	1.60 (0.02)

Cumulative Effects

In 2004, the USFWS determined that listing of the West Coast population of the fisher was warranted, and identified the following primary threats from activities on NFS lands: (1) loss and fragmentation of habitat due to timber harvest and hazardous fuels reduction; (2) increased predation resulting from canopy cover reductions; (3) mortality from vehicle collisions; and (4) increased human disturbance. Appendix B (STF Travel Management DEIS) provides a list and description of past, present, and reasonably foreseeable projects on the STF and private lands within the Forest boundary.

On the STF, past timber harvest and more recent hazardous fuels reduction projects have reduced large trees, canopy cover, structural complexity, and coarse woody material within treated units. Between 2000 and 2008, vegetation/fuels thinning treatments on NFS lands have occurred within less than 4% of fisher habitat. These vegetation treatments have reduced habitat quality for fisher by reducing canopy cover, structural complexity, and coarse woody material within treated units. At the larger landscape scale, these treatments may affect the size and

connectivity of patches of high quality habitat. Vegetation/fuels reduction projects will continue to be one of the primary activities affecting fisher habitat on the STF (Appendix B STF Travel Management DEIS). These projects will likely occur on an estimated 3,500 acres per year, based upon the acreage treated in 2006. Some, but not all of them will affect fisher habitat. Over time, fuels treatments are expected to alter 20 to 30 percent of the landscape, with a resulting expectation that the amount of habitat removed by stand replacing wildfires will be reduced in response to these treatments (USDA 2004).

Recreation use has increased and is expected to continue to increase on the STF (see Recreation section Affected Environment), resulting in greater likelihood and magnitude of human disturbance to wildlife. OHV use has been increasing at an even more rapid pace than other forms of recreation, based upon State figures for OHV sales (see Recreation section). If fisher were to recolonize or to be reintroduced on the STF, project alternatives would contribute to these past and current conditions with added displacement from noise and human activity, and fragmentation of habitat. Because Alternative 2 does not prohibit cross-country travel, there is a high degree of uncertainty about future route proliferation and associated cumulative impacts upon fisher. The action alternatives do not result in a loss of habitat (no route construction), but noise and traffic disturbance would influence habitat use and availability where fisher may be present (if re-established). In the future, there is approximately 5 miles of new trail construction that is proposed to be added to the NFTS as well as numerous short route segments for dispersed camping access. These trails are proposed to provide "connector routes" between existing NFTS routes and motorized access to historical dispersed camping opportunities.

In addressing the effects of roads upon fisher, the USFWS concluded that, road-related effects on low density carnivores like fishers "are more severe than most other wildlife species due to their large home ranges, relatively low fecundity, and low natural population density." Since routes proposed within the action alternatives are native surfaced routes that do not generally have high rates of travel, these road-related effects are expected to be minimal. The greatest influence upon fisher habitat occurs under Alternative 2 and progressively lower levels of impact occur under Alternatives 4, 1 and 5. Thus, the combined effect of the project alternatives and current levels of hazardous fuels reduction treatments may result in adverse cumulative effects (if re-established). These effects could potentially have minor impacts on the ability or likelihood for fisher to re-occupy suitable habitat on the STF. 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).

Determinations

Alternative 1

This alternative would result in increased amounts of disturbance (if re-established) and habitat fragmentation within the project area, but would be limited over the long-term since cross-country travel would be prohibited. Disturbance (if re-established) and habitat fragmentation resulting from this alternative may result in adverse impacts to a few individual fisher. These impacts would likely be minor, and would not likely impact the individual's fitness. Therefore, these effects would not likely result in any impacts to fisher populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat of a species that has been found warranted for federal listing, but will not likely cause a loss of viability to the population or species*" for the Pacific fisher.

Alternative 2

Although this alternative would result in increased amounts of disturbance (if re-established) and habitat fragmentation within the project area, continued route proliferation would ultimately be limited by topography, vegetation, and wilderness areas. Disturbance (if re-established) resulting from this alternative would likely result in adverse impacts to some individual fisher. Increased habitat fragmentation from route proliferation may result in impacts to individuals over the long-

term. Although route proliferation may impact some individual fisher and their habitat over the long-term, restricted access by topography, vegetation, and wilderness areas would result in significant amounts of unimpacted suitable habitat over the short and long-term. Therefore, potential impacts from this alternative would not likely have measurable impacts to populations (if re-established) within the project area.

Therefore, it is my determination that this alternative "*may impact individuals or habitat of a species that has been found warranted for federal listing, but will not likely cause a loss of viability to the population or species*" for the Pacific fisher.

Alternative 3
Cross-country travel would be prohibited and there would not be any motorized routes added to the NFTS in this alternative. Prohibiting cross-country travel would reduce future disturbance to individual fisher and prevent further fragmentation of their habitat over the long-term.

Therefore, it is my determination that this alternative would have a "*Beneficial Impact*" on the Pacific fisher.

Alternative 4
This alternative would result in increased amounts of disturbance (if re-established) and habitat fragmentation within the project area, but would be limited over the long-term since cross-country travel would be prohibited. Disturbance (if re-established) and habitat fragmentation resulting from this alternative may result in adverse impacts to a few individual fisher. These impacts would likely be minor, and would not likely impact the individual's fitness. Therefore, these effects would not likely result in any impacts to fisher populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat of a species that has been found warranted for federal listing, but will not likely cause a loss of viability to the population or species*" for the Pacific fisher.

Alternative 5
This alternative would result in increased amounts of disturbance (if re-established) and habitat fragmentation within the project area, but would be limited over the long-term since cross-country travel would be prohibited. Disturbance (if re-established) and habitat fragmentation resulting from this alternative may result in adverse impacts to a few individual fisher. These impacts would likely be minor, and would not likely impact the individual's fitness. Therefore, these effects would not likely result in any impacts to fisher populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat of a species that has been found warranted for federal listing, but will not likely cause a loss of viability to the population or species*" for the Pacific fisher.

California Wolverine
Gulo gulo luteus

Species and Habitat Account

The wolverine is a wide-ranging mammal that once occupied high elevation habitat throughout the western United States. Recent research by Schwartz et al. (2007) found that wolverines which inhabited the Sierra Nevada Mountains of California were isolated and genetically distinct from extant populations. The California wolverine was once relatively common in the Sierra Nevada, but the last verifiable record from the Sierra Nevada is from 1922 and it is widely accepted that these wolverines were extirpated in the 1930's (Grinnell et al. 1937, Aubrey et al. 2007, Schwartz et al. 2007). Significant effort has been exerted to detect wolverines in the Sierra

Nevada Mountains through bait stations, cameras, and helicopter surveys (Kucera and Barrett 1993, Aubry and Lewis 2003, Zielinski et al. 2005, Aubrey 2007). These surveys and numerous other track-plate and camera surveys have resulted in no wolverine detections until recently. In February and March 2008, verified wolverine photographic detections were taken from 4 separate remote controlled camera stations on the Tahoe NF between the towns of Truckee, CA and Sierraville, CA. Genetic results indicate the DNA evidence that has been collected to date is from a single individual and is a male. DNA testing also indicates this individual is not related to the wolverine population from the southern Sierra Nevada region and it is also not related to wolverine populations in the Cascades region of Washington state. DNA results indicate that this particular wolverine has haplotype A, which is ubiquitous and shared with wolverine populations in the Rocky Mountains, Canada, and Alaska. At this time, the origin of this individual is unknown. Although numerous mesocarnivore surveys have been completed on the STF with the use of baited camera stations and track plates, there have been no recent wolverine detections within the project area.

Wolverines prefer high elevation areas that are often associated with subalpine or tree line habitats, but many of their life history needs are met in forested habitat types (Banci 1994, Aubry et al. 2007, Copeland et al. 2007). Subalpine and tree line habitats typically occur above 8000 feet in elevation on the STF. Since wolverines use forested habitats and lower elevations during the winter, this analysis will assume that suitable wolverine habitat exists above 7000 feet in elevation.

Management Direction

The California wolverine was identified by the Regional Forester as a Sensitive Species on the STF (USDA 2007a). The Forest Plan Direction does not provide any specific management direction related to this project for the California wolverine.

Direct & Indirect Effects

General – All Alternatives

The project alternatives could result in direct and indirect effects to the wolverine by:

- Prohibiting cross-country travel off of the NFTS,
- Adding facilities to the NFTS,
- Changing the type of use on NFTS routes,
- Changing the season of use on NFTS routes,
- Implementing mitigation measures.

The actions listed above may have direct and indirect effects on wolverines through: human-caused mortality, changes in behavior, and habitat modification.

Human-Caused Mortality:

Types of human-caused mortality that may result from the project alternatives include: collisions with vehicles. Although wolverines occur in very low densities and are rarely hit by vehicles, wolverines have large home ranges and may travel significant distances everyday. Adding routes to the NFTS may result in increased probability of wolverines being hit by vehicles. Collisions typically occur along well maintained roadways that allow high rates of travel. Routes proposed for designation within the project alternatives are native surfaced routes that allow much slower rates of travel. These types of routes would result in far fewer collisions.

Changes in Behavior:

Wolverines are considered to be sensitive to human presence and recreational activities (Banci 1994, May et al. 2006). Allowing cross-country travel or adding routes to the NFTS could result in displacement or avoidance or disturbance at a specific location, such as a den site (Copeland 1996). There are no known natal den sites on the STF, but such sites would most likely occur on talus slopes in rocky areas in deep snow above timberline (Banci 1994, USDA 2001). The

majority of such habitat occurs above 8000 feet in elevation within the Emigrant, Carson-Iceburg, and Mokelumne Wilderness areas on the STF.

Habitat Modification:
Since wolverines once occurred throughout high elevation habitats in the Sierra Nevada Mountains, allowing cross-country travel or adding routes to the NFTS may result in indirect effects to wolverines through habitat fragmentation. Wolverines are known to have large home ranges, sometimes exceeding 300 square miles (Banci 1994). May et al. (2006) found that the presence of human development formed a more important factor in home range selection than did vegetation or habitat type. Although route density thresholds have not been established in the literature, increasing road densities in high elevation habitats between wilderness areas would result in reduced habitat suitability.

Alternative 1
Cross-Country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes within preferred wolverine habitat. This would reduce the risk of direct and indirect effects to wolverine from motorized travel over the long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: The direct or indirect effects of these actions would be insignificant and discountable to wolverines for the following reasons:

- Despite significant survey efforts, there have not been any recent documented wolverine sightings within the project area.
- The State of California banned the use of body-gripping traps in 1998; resulting in a negligible impact from incidental capture that may occur from increased access.
- The majority of suitable habitat within the project area exists within the wilderness areas and would not be impacted by this alternative.
- Additions to the NFTS, would have a negligible impact on suitable habitat fragmentation.

Season of Use: Preferred wolverine habitat is primarily located throughout the highest elevations within the project area. Motorized use would be seasonally restricted (as identified for each route in Appendix I of the STF Travel Management DEIS) in all preferred wolverine habitat outside wilderness areas; providing further beneficial impacts.

Mitigation Measures: The types of mitigation measures that would be implemented within preferred wolverine habitat include: tread hardening, drain dips, and fence/log/rock barriers. Implementation of these mitigation measures would include hand tool and machine work that would result in short-term noise disturbance within the project area. This short-term noise disturbance would not likely affect wolverines (see above).

Alternative 2
Cross-Country Travel: Cross-country travel would not be prohibited under this alternative. Therefore it is assumed that route proliferation would continue over the short and long-term and the effects would be similar to those discussed below for adding routes to the NFTS.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: Although this alternative would not result in the addition of any miles of unauthorized routes to the NFTS, vehicles would be allowed to use all existing motorized trails because cross-country travel would be allowed. Therefore, it is assumed that wheeled motorized vehicles will continue to use all of the documented unauthorized routes previously identified and continue to create new routes. The use of these routes and the continued proliferation of new routes would result in increasing amounts of habitat fragmentation/modification.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would provide beneficial impacts to wolverines.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 3
Cross-Country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes within preferred wolverine habitat. This would reduce the risk of direct and indirect effects to wolverines from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: This alternative would not result in the addition of any motorized routes to the NFTS, nor would it change the type of use on any current NFTS routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would provide beneficial impacts to wolverines.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 4
The direct and indirect effects of this alternative would be the same as those discussed for Alternative 1.

Alternative 5
The direct and indirect effects of this alternative would be the same as those discussed for Alternative 1.

Cumulative Effects

When completing its status review of the Pacific fisher, the U.S. Fish and Wildlife Service concluded that road-related effects on low density carnivores like fishers "are more severe than most other wildlife species due to their large home ranges, relatively low fecundity, and low natural population density." These same concerns would seem to apply equally to the wolverine. Assuming that the wolverine's suitable habitat on the STF is limited to all but the most minimally developed and roaded areas, land management activities other than human recreation are generally not affecting wolverine habitat. The Forest Service (2001) described human presence and high country activity, including snowmobile use, backcountry hiking, and high country motorized use, as being the most substantial factors potentially limiting the recovery of wolverine. Existing human settlement and dispersal barriers, such as major highways, in and of themselves result in uncertainty about the potential for wolverine persistence in the Sierra Nevada (Banci et al. 1984).

Alternatives 1, 3, 4, and 5 would not have any adverse direct or indirect effects to the California wolverine; therefore, these alternatives would not contribute to the cumulative effects for this species. Since there would not be a prohibition on cross-country travel, Alternative 2 presents the greatest risk to wolverine habitat modification/fragmentation within the project area. Since the majority of suitable wolverine habitat within the project area and the Sierra Nevada's of California is located within wilderness and roadless areas, the impacts of Alternative 2 would be limited over the long-term. The combined effects of these factors and the additional access provided to high country areas in Alternative 2 could result in adverse impacts to wolverines through further habitat fragmentation.

Determinations

Alternative 1
The direct and indirect effects of this alternative would be insignificant and discountable.

Therefore, it is my determination that this alternative would have *"No Impact"* on the California wolverine.

Alternative 2
Although this alternative would result in increased amounts of habitat fragmentation within the project area, continued route proliferation would ultimately be limited by topography, vegetation, and wilderness areas. Increased habitat fragmentation may result in minor impacts over the long-term, but suitable wolverine habitat largely exists outside of areas that are currently roaded and that may become more roaded through route proliferation.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the California wolverine.

Alternative 3
Cross-country travel would be prohibited and there would not be any motorized routes added to the NFTS in this alternative. Prohibiting cross-country travel would prevent habitat fragmentation over the long-term.

Therefore, it is my determination that this alternative would have a "*Beneficial Impac*t" on the California wolverine.

Alternative 4
The direct and indirect effects of this alternative would be insignificant and discountable.

Therefore, it is my determination that this alternative would have *"No Impact"* on the California wolverine.

Alternative 5
The direct and indirect effects of this alternative would be insignificant and discountable.

Therefore, it is my determination that this alternative would have *"No Impact"* on the California wolverine.

Sierra Nevada Red Fox
Vulpes vulpes necator

Species and Habitat Account

The Sierra Nevada red fox (SNRF) is a small candid that once occupied high elevation habitat throughout much of the Sierra Nevada Mountains (Grinnell 1937). Despite significant amounts of effort, there have been no recent detections of the SNRF in the Sierra Nevada's and the only known population currently exists in the Lassen Peak region (Perrine 2005, Zielinski et al. 2005). Although numerous mesocarnivore surveys have been completed on the STF with the use of baited camera stations and track plates, there have been no detections of the Sierra Nevada red fox within the project area.

The SNRF inhabits high elevation forests and subalpine habitat that are interspersed with riparian and meadow habitat (Ingles 1965, Perrine 2005). Preferred forest types include red fir, lodgepole pine and subalpine fir (Schempf and White 1977). They occur primarily at elevations greater than 7000 feet and meadows are thought to be important foraging areas (Schempf and White 1977, USDA 2001). Subalpine habitats typically occur above 8000 feet in elevation on the STF, but for

the purposes of this analysis it will be assumed that suitable SNRF habitat exists above 7000 feet in elevation.

Management Direction

The Sierra Nevada red fox was identified by the Regional Forester as a Sensitive Species on the STF (USDA 2007a). The Forest Plan Direction does not provide any specific management direction related to this project for the Sierra Nevada red fox.

Direct & Indirect Effects

General – All Alternatives

The project alternatives could result in direct and indirect effects to the SNRF by:

- Prohibiting cross-country travel off of the NFTS,
- Adding facilities to the NFTS,
- Changing the type of use on NFTS routes,
- Changing the season of use on NFTS routes,
- Implementing mitigation measures.

The actions listed above may have direct and indirect effects on the SNRF through: human-caused mortality, changes in behavior, and habitat modification.

Human-Caused Mortality:

Types of human-caused mortality that may result from the project alternatives include: collisions with vehicles. The effects of collisions were previously discussed and are similar to those disclosed within the wolverine section.

Changes in Behavior:

Sierra Nevada red fox are considered to be sensitive to human disturbance (Grinnel 1937). Allowing cross-country use or adding routes to the NFTS could result in disturbance or displacement at a specific location, such as den sites. There are no known den sites and there have not been any documented sightings of a SNRF within the project area. Therefore, disturbance or displacement at a specific location is unlikely to occur.

Habitat Modification:

Allowing cross-country travel or adding new routes within high elevation meadows could decrease their value as foraging areas for SNRF. Although numerous vegetation types above 7000 feet in elevation provide habitat for the SNRF, meadows appear to be particularly important foraging areas (USDA 2001).

Alternative 1

Cross-Country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes within preferred SNRF habitat. This would reduce the risk of direct and indirect effects to the SNRF from motorized travel over the long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: The direct or indirect effects of these actions would be insignificant and discountable to the SNRF for the following reasons:

- Despite significant survey efforts, there have not been any recent documented sightings of the SNRF within the project area; the closest documented population is over 150 miles away, located in the Lassen Peak area.
- The State of California banned the use of body-gripping traps in 1998; resulting in a negligible impact from incidental capture that may occur from increased access.
- The majority of suitable habitat within the project area exists within the wilderness areas that would not be impacted by the project alternatives.

- Additions to the NFTS, would have a negligible impact on suitable habitat fragmentation.

Season of Use: Preferred SNRF habitat is primarily located throughout the highest elevations within the project area. Motorized use would be seasonally restricted (as identified for each route in Appendix I of the STF Travel Management DEIS) in all preferred SNRF habitat outside wilderness areas; providing further beneficial impacts.

Mitigation Measures: The types of mitigation measures that would be implemented within preferred SNRF habitat include: tread hardening, drain dips, and fence/log/rock barriers. Implementation of these mitigation measures would include hand tool and machine work that would result in short-term noise disturbance within the project area. This disturbance would not likely affect the SNRF (see above).

Alternative 2
Cross-Country Travel: Cross-country travel would not be prohibited under this alternative. Therefore it is assumed that route proliferation would continue over the short and long-term and the effects would be similar to those discussed below for adding routes to the NFTS.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: Although this alternative would not result in the addition of any miles of unauthorized routes to the NFTS, vehicles would be allowed to use all existing motorized trails because cross-country travel would be allowed. Therefore, it is assumed that wheeled motorized vehicles will continue to use all of the documented unauthorized routes previously identified and continue to create new routes. The use of these routes and the continued proliferation of new routes would result in increasing amounts of habitat fragmentation/modification.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would provide beneficial impacts to the SNRF.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 3
Cross-Country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes within preferred SNRF habitat. This would reduce the risk of direct and indirect effects to the SNRF from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: This alternative would not result in the addition of any motorized routes to the NFTS, nor would it change the type of use on any current NFTS routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would provide beneficial impacts to the SNRF.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 4
The direct and indirect effects of this alternative would be the same as those discussed for Alternative 1.

Alternative 5

The direct and indirect effects of this alternative would be the same as those discussed for Alternative 1.

Cumulative Effects

The Sierra Nevada red fox is currently considered "extremely endangered" and its population size, extent, and trend are unknown (CDFG 1996). Cumulative effects are similar to those described for the wolverine. The EIS for the Sierra Nevada Forest Plan Amendment (USDA 2001) concluded that, based upon historic descriptions of habitat and behavior, any actions taken to minimize new and open roads, to limit human encroachment into the higher elevations, and to improve conditions of high elevations meadows will likely benefit the Sierra Nevada red fox. Alternatives 1, 4, and 5 would not have any direct or indirect effects to the Sierra Nevada red fox; therefore, these alternatives would not contribute to the cumulative effects for this species. Alternatives 2 would have the greatest risk to these foxes since it does not limit human access into higher elevations or limit access through meadows. Since the majority of suitable SNRF habitat within the project area and the Sierra Nevada's of California is located within wilderness and roadless areas, the impacts of Alternative 2 would be limited over the long-term.

Determinations

Alternative 1

The direct and indirect effects of this alternative would be insignificant and discountable.

Therefore, it is my determination that this alternative would have *"No Impact"* on the Sierra Nevada red fox.

Alternative 2

Although this alternative would result in increased amounts of habitat fragmentation within the project area, continued route proliferation would ultimately be limited by topography, vegetation, and wilderness areas. Increased habitat fragmentation may result in minor impacts over the long-term, but suitable SNRF habitat largely exists outside of areas that are currently roaded and that may become more roaded through route proliferation.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the Sierra Nevada red fox.

Alternative 3

Cross-country travel would be prohibited and there would not be any motorized routes added to the NFTS in this alternative. Prohibiting cross-country travel would prevent habitat fragmentation over the long-term.

Therefore, it is my determination that this alternative would have a "*Beneficial Impact*" on the Sierra Nevada red fox.

Alternative 4

The direct and indirect effects of this alternative would be insignificant and discountable.

Therefore, it is my determination that this alternative would have *"No Impact"* on the Sierra Nevada red fox.

Alternative 5

The direct and indirect effects of this alternative would be insignificant and discountable.

Therefore, it is my determination that this alternative would have *"No Impact"* on the Sierra Nevada red fox.

Townsend's Big-eared Bat
Corynorhinus townsendii

Species and Habitat Account
Townsend's bat populations have experienced serious declines in recent history in parts of California (Pierson and Rainey 1998). They are typically found in low desert to mid-elevation montane habitats throughout the West and are distributed from the southern portion of British Columbia south along the Pacific Coast to central Mexico and east into the Great Plains, with isolated populations occurring in the south and southeastern United States (Kunz and Martin 1982). The Townsend's big-eared bat is a rare cavity-dwelling bat that is largely dependent upon suitable roost sites (Kunz and Martin 1982). These bats are known to primarily roost in caves or cave-like dwellings that are often found in and around historical mines (Sherwin et al. 2000). Since these bats are so loyal to natal sites, protection of maternity roosts are important for conservation of the species (Pierson and Rainey 1998). While comprehensive bat surveys have not been completed over the STF, Gellman (1994) found Townsend's bats at two sample sites on the Forest. Although there are no known active maternal roost colonies located on the Forest there is one historical colony located at Bower Cave that receives periodic Townsend bat use (Pierson and Rainey 1998). Bower Cave is managed as a Special Interest Area and has restricted public access.

Management Direction
The Townsend's big-eared bat was identified by the Regional Forester as a Sensitive Species on the STF (USDA 2007a). The Forest Plan Direction does not provide any specific management direction related to this project for the Townsend's big-eared bat.

Direct & Indirect Effects
General – All Alternatives
The use of motorized routes is not known or suspected to have direct or indirect effects upon this species, unless routes were to create or improve human access to a maternal roost colony. There are no known active maternal roosts on the STF and Bower Cave is the only location thought to have supported a historical colony. The project alternatives would not improve access to Bower Cave, which is protected by a fence and a locked gate. Therefore the project alternatives would not likely have any direct or indirect effects to the Townsend's big-eared bat.

Cumulative Effects
The lack of direct or indirect effects of the project alternatives precludes them from having any cumulative effects to this species.

Determinations
It is my determination that the project alternatives would have *"No Impact"* on the Townsend's big-eared bat.

Western Red Bat
Lasiurus blossevillii

Species and Habitat Account
The western red bat is considered to be rare in the State, but sparsely occurs throughout lower elevations in much of California west of the Sierra Nevada crest (Philpott 1997, Zeiner et al. 1990). These bats are a solitary species that do not form colonies and typically roost in vegetation near riparian areas. There are many gaps in the knowledge about this species, and more information is required on roosting requirements, altitudinal distribution, migration patterns, effects of controlled burns, and effects of pesticide use (Bolster 1998). Comprehensive bat surveys have not been completed on the STF. Although Gellman (1994) did not find any western red bats at 12

survey sites that were sampled across the Forest, Pierson et al. (2004) documented them in several locations throughout Tuolumne County.

Management Direction
The western red bat was identified by the Regional Forester as a Sensitive Species on the STF (USDA 2007a). The Forest Plan Direction does not provide any specific management direction related to this project for the western red bat.

Direct & Indirect Effects
General – All Alternatives
The use of motorized routes is not known or suspected to have direct or indirect effects upon this species. The designation of routes and the creation of open areas may improve foraging habitat. Therefore, the project alternatives would not likely have any direct or indirect effects to the Western red bat.

Cumulative Effects
The lack of direct or indirect effects of the project alternatives precludes them from having any cumulative effects to this species.

Determinations
It is my determination that the project alternatives would have *"No Impact"* on the Western red bat.

Pallid Bat
Antrozous pallidus

Species and Habitat Account
Pallid bats are a gregarious colony forming species that occur throughout most of California. They are roosting habitat generalists and have been known to roost in rock crevices, tree hollows, and man-made structures (USDA 2001). Tree roosting has been documented in large conifer snags, inside basal hollows of redwoods and giant sequoias, and bole cavities in oaks (Sherwin 1998). While comprehensive bat surveys have not been completed over the STF, Gellman (1994) found pallid bats at 3 of the 12 survey sites that were sampled across the Forest. Although pallid bat roost sites have not been inventoried on STF, it is assumed that they are present in a wide variety of locations.

Management Direction
The pallid bat was identified by the Regional Forester as a Sensitive Species on the STF (USDA 2007a). The Forest Plan Direction does not provide any specific management direction related to this project for the pallid bat.

Direct & Indirect Effects
General – All Alternatives
The use of motorized routes is not known or suspected to have direct effects upon this species. Since pallid bats are roosting habitat generalists and may use snags for roosting, the addition of roads to the NFTS may have indirect adverse effects on pallid bat roosting habitat. Forest policy requires that hazard trees are removed along roads for public safety, often resulting in a reduction of snags within a 60 meter zone along both sides of NFTS roads. Hazard tree removal along NFTS roads has the potential to reduce potential roost sites for the pallid bat. Hazard tree removal is typically conducted along Maintenance Level 2, 3, 4, and 5 roads (not Maintenance Level 1 roads or trails). The project alternatives primarily propose actions on trails and maintenance level (ML) 1 roads. Limited actions that are proposed on ML2, 3, 4, or 5 roads within any of the project alternatives would result in a net reduction in miles of road which hazard trees

may be removed along. Therefore, the minor amounts of impact that the project alternatives may have on future hazard tree removal would be beneficial to pallid bat habitat.

Cumulative Effects
The lack of direct or indirect adverse effects of the project alternatives precludes them from having any cumulative effects to this species.

Determinations
It is my determination that the project alternatives would have *"No Impact"* on the pallid bat.

Bald Eagle
Haliaeetus leucocephalus

Species and Habitat Account
The bald eagle is a large raptor that is found throughout North America. Once listed as an endangered species the bald eagle has experienced range wide population increases since a nationwide ban on the use of DDT, a pesticide which causes eggshell thinning and low reproduction success. Bald eagles are strongly associated with large riparian areas since their primary prey species are waterfowl and fish. On the STF, bald eagles are commonly seen wintering along numerous bodies of water including: Beardsley Reservoir, Cherry Lake, and Lyons Lake. The STF has four bald eagle management areas and two known nest sites. Neither of the nest sites are within the designated management areas, but are located near the management areas on the shores of Beardsley Reservoir and Cherry Lake. Two other areas that may provide suitable nesting habitat for bald eagles are Salt Springs Reservoir and Lyons Lake. Bald eagles have been observed at both of these locations, but despite numerous surveys nesting has never been documented.

Management Direction
The bald eagle was listed by the U.S. Fish and Wildlife Service (USFWS) as a federally endangered species in 1978 and was removed from the federal list of Threatened and Endangered Species on June 28, 2007. The bald eagle was identified by the Regional Forester as a Sensitive Species on the STF (USDA 2007a). Since 1978 populations have increased nationwide as well as in the Sierra Nevada (USDA 2001). Management direction for the bald eagle is now provided by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c) and the Migratory Bird Treaty Act (16 USC 703-712) of 1972. Under these acts, disturbance that is likely to cause injury, substantial interference with normal breeding, feeding or sheltering behavior, or nest abandonment is prohibited (USDI 2007). The USDI (2007) provided the following management guidelines to minimize disturbance to bald eagles:

- Off-road vehicle use (including snowmobiles). No buffer is necessary around nest sites outside the breeding season. During the breeding season, do not operate off-road vehicles within 330 feet of the nest. In open areas, where there is increased visibility and exposure to noise, this distance should be extended to 660 feet.
- Minimize potentially disruptive activities and development in the eagles' direct flight path between their nest and roost sites and important foraging areas.

The Forest Plan Direction contains the following management direction associated with the proposed project for the bald eagle:

- Within Designated Territories (delineated bald eagle management areas, or additional territories, based on nesting occupancy):
    - Implement a Limited Operating Period (LOP) from January 1 through August 31.
        - Apply LOP restriction to motor vehicle activities on level 1 roads and OHV routes open to the general public.
    - Prohibit motor vehicle activity in wetlands, streamside management zones, and within 200 feet of lake shorelines that are used by bald eagles.

- Outside Designated Territories (new active bald eagle nests outside of designated management territories):
    - From January 1 through August 31, implement the following restriction around the nest for a distance determined by the Wildlife Biologist on a site-specific basis.
        - Re-route existing OHV use to routes at a safe distance from the nest.
        - Close or detour existing roads in the proximity of the nest site.
        - Prohibit motor vehicle activities in the roost area.

Direct & Indirect Effects

General – All Alternatives

The project alternatives could result in direct and indirect effects to the bald eagle by:

- Prohibiting cross-country travel off of the NFTS,
- Adding facilities to the NFTS,
- Changing the type of use on NFTS routes,
- Changing the season of use on NFTS routes,
- Implementing mitigation measures.

These actions may have direct and indirect effects on bald eagles through: human-caused mortality, changes in behavior, and habitat modification.

Human-Caused Mortality: In general, the road and trail-associated factors that have been identified for the bald eagle include poaching, disturbance at specific site (nests and roost sites), and avoidance and displacement (Skagen et al. 1991, Stalmaster and Newman 1978).

Changes in Behavior: In general, the road and trail-associated factors that have been identified for the bald eagle include poaching, disturbance at specific site (nests and roost sites), and avoidance and displacement (Skagen et al. 1991, Stalmaster and Newman 1978).Individuals will show different thresholds of tolerances for disturbance, but are particularly vulnerable during the breeding season. Several studies reported that eagles avoid or are adversely affected by human disturbance during the breeding period and may result in nest abandonment and reproductive failure (Stalmaster and Newman 1978, Andrew and Mosher 1982, Fraser et al. 1985, Knight and Skagen 1988, Buehler et al. 1991, Grubb and King 1991, Grubb et al. 1992, Chandler et al. 1995, Grubb 1995, Trombulak and Frissell 2000). Although disturbance has been shown to adversely affect nesting bald eagles, individual pairs of bald eagles may be more tolerant to disturbance. For example, the Tahoe National Forest documented a bald eagle nest, in 2005, near a County road that was used to access a popular reservoir. A similar case has been documented on the Stanislaus National Forest where the pair continues to successfully reproduce.

Adding routes to the NFTS or converting ML1 roads to trails may result in increased disturbance to nesting or foraging bald eagles. To reduce disturbance to nesting bald eagles, land management agencies typically implement restrictions on certain activities within a specified distance (buffer) of nests. Recommended buffers around nests have typically varied between 100 and 800 meters (Anthony and Isaacs 1989, Fraser et al. 1985, McGarigal 1988, Stalmaster 1987, USDI 2007). Latest recommendations from USDI (2007) suggest 660 feet where there is increased visibility and exposure to noise. To minimize disturbance to foraging bald eagles routes motorized vehicles use should be minimized or not allowed between nesting or roosting sites and foraging areas (USDI 2007).

Habitat Modification: Travel management and motorized activity may also indirectly affect bald eagles through impacts to potentially suitable roost or nest trees and to their prey base. Forest policy requires that hazard trees are removed along roads for public safety, often resulting in a reduction of snags within a 60 meter zone along both sides of some NFTS roads. Hazard tree removal along NFTS roads has the potential to reduce potential nest and roost sites for bald eagles. Hazard tree removal is typically conducted along Maintenance Level 2, 3, 4, and 5 roads (not Maintenance Level 1 roads or trails). The project alternatives primarily propose actions on

trails and maintenance level (ML) 1 roads. Limited actions that are proposed on ML2, 3, 4, or 5 roads within any of the project alternatives would result in a net reduction in miles of road which hazard trees may be removed along. Therefore, the minor amounts of impact that the project alternatives may have on future hazard tree removal would be beneficial to bald eagle habitat.

Although bald eagles are opportunistic foragers, their primary prey base is fish. Roads and trails may contribute sediment to nearby streams, thereby reducing the quantity and quality of fish spawning habitat. Although the action alternatives would result in some sedimentation to select drainages within the project area, the primary foraging areas for bald eagles in the project area are lakes and reservoirs. These lakes and reservoirs contain abundant populations of fish, which provide an adequate prey base for bald eagles. Sedimentation resulting from the action alternatives will result in an immeasurable decrease in fish populations associated with bald eagle foraging.

Indicators
Based upon the available literature, the following indicators were chosen to provide a relative measure of the direct and indirect effects to the bald eagle. 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 Designated Territories.
- Miles of ML1 roads converted to trails within Designated Territories.
- Miles of routes added to the NFTS within 660 feet of nest sites.
- Miles of ML1 roads converted to trails within 660 feet of nest sites.
- Miles of routes added to NFTS within 400 meters of lakes/reservoirs used for foraging.
- Miles of ML1 roads converted to trails within 400 meters of lakes/reservoirs used for foraging.

Alternative 1

Cross-Country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes within Designated Territories, near nest sites, and near foraging areas. This would reduce the risk of direct and indirect effects to bald eagles from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 1, several analyses were completed (Table 17). Actions proposed in this alternative would not likely result in any human-caused mortality, but would likely increase disturbance to bald eagles within the project area. This alternative would add approximately 0.79 miles of unauthorized routes to the NFTS and would convert approximately 0.93 miles of ML1 road to trail within 400 meters of bald eagle foraging areas. These changes would likely result in disturbance to some individual eagles.
Actions proposed in this alternative would not likely result in any indirect effects to bald eagles through habitat modification. These actions would not result in any adverse impacts to available roost or nest sites nor would they measurably impact the bald eagles' prey base.

Season of Use: Although the exact timing may vary, bald eagles may start nesting in late winter into early spring. Bald eagle nest sites and foraging areas are located within Zone 2 and Zone 3 of the seasonal closure (as identified for each route in Appendix I of the STF Travel Management DEIS). These closures would reduce disturbance to over-wintering individuals and bald eagle pairs during the early portion of their nesting season.

Mitigation Measures: Mitigation measures would not be implemented near any bald eagle nest sites or within any Designated Territories. The only types of mitigation measures that would be implemented near reservoirs used for foraging are tread hardening and drain dips. Implementation of these mitigation measures would include hand tool and machine work that may

result in short-term disturbance to individual foraging eagles within the project area. This amount of disturbance would not likely reduce any individual bald eagles fitness and would not result in any population level impacts within the project area.

Table 17. Bald Eagle: Direct and Indirect Effects Indicators - Alternative 1

Alternative 1 - Bald Eagle - Direct and Indirect Effects Indicators	
Miles of routes added to the NFTS within Designated Territories	0
Miles of ML1 roads converted to trails within Designated Territories	0
Miles of routes added to the NFTS within 660 feet of nest sites	0
Miles of ML1 roads converted to trails within 660 feet of nest sites	0
Miles of routes added to the NFTS within 400 meters of lakes/reservoirs used for foraging	0.79
Miles of ML1 roads converted to trails within 400 meters of lakes/reservoirs used for foraging	0.93

Alternative 2

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

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: Although this alternative would not result in the addition of any miles of unauthorized routes to the NFTS, vehicles would be allowed to use all existing motorized trails because cross-country travel would be allowed. Therefore, it is assumed that wheeled motorized vehicles will continue to use all of the documented unauthorized routes previously identified and continue to create new routes. The use of these routes and the continued proliferation of new routes would result in increasing amounts of direct and indirect effects to bald eagles. These effects would be similar to those discussed within Alternative 4 for the short-term, but would be exacerbated over the long-term by the continued proliferation of routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would reduce potential disturbance to bald eagles.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 3

Cross-Country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes within Designated Territories, near nest sites, and near foraging areas. This would reduce the risk of direct and indirect effects to bald eagles from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: This alternative would not result in the addition of any motorized routes to the NFTS, nor would it change the type of use on any current NFTS routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would reduce potential disturbance to bald eagles.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 4

Cross-Country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes within Designated Territories, near nest sites, and near foraging areas. This would reduce the risk of direct and indirect effects to bald eagles from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 4, several analyses were completed (Table 18). Direct and indirect effects of the actions proposed in this alternative would be the same as those discussed in Alternative 1.

Season of Use: Although the exact timing may vary, bald eagles may start nesting in late winter into early spring. Bald eagle nest sites and foraging areas are located within Zone 2 and Zone 3 of the seasonal closure (as identified for each route in Appendix I of the STF Travel Management DEIS). These closures would reduce disturbance to over-wintering individuals and bald eagle pairs during the early portion of their nesting season.

Mitigation Measures: The effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 18. Bald Eagle: Direct and Indirect Effects Indicators - Alternative 4

Alternative 4 - Bald Eagle - Direct and Indirect Effects Indicators	
Miles of routes added to the NFTS within Designated Territories	0
Miles of ML1 roads converted to trails within Designated Territories	0
Miles of routes added to the NFTS within 660 feet of nest sites	0
Miles of ML1 roads converted to trails within 660 feet of nest sites	0
Miles of routes added to the NFTS within 400 meters of lakes/reservoirs used for foraging	0.79
Miles of ML1 roads converted to trails within 400 meters of lakes/reservoirs used for foraging	0.93

Alternative 5

Cross-Country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes within Designated Territories, near nest sites, and near foraging areas. This would reduce the risk of direct and indirect effects to bald eagles from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 5, several analyses were completed (Table 19). Direct and indirect effects of the actions proposed in this alternative would be similar to those discussed in Alternative 1. Since there is a decrease from Alternative 1 in the number of routes added to the system or converted to a trail near foraging habitat, there would be a

decrease in the direct effects to bald eagles within the project area. Since these impacts would affect a very small percentage of marten habitat (Table 19), these actions would likely impact some individuals but would not likely result in impacts to populations within the project area over the short or long-term.

Season of Use: Although the exact timing may vary, bald eagles may start nesting in late winter into early spring. Bald eagle nest sites and foraging areas are located within Zone 2 and Zone 3 of the seasonal closure (as identified for each route in Appendix I of the STF Travel Management DEIS). These closures would reduce disturbance to over-wintering individuals and bald eagle pairs during the early portion of their nesting season.

Mitigation Measures: The effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 19. Bald Eagle: Direct and Indirect Effects Indicators - Alternative 5

Alternative 5 - Bald Eagle - Direct and Indirect Effects Indicators	
Miles of routes added to the NFTS within Designated Territories	0
Miles of ML1 roads converted to trails within Designated Territories	0
Miles of routes added to the NFTS within 660 feet of nest sites	0
Miles of ML1 roads converted to trails within 660 feet of nest sites	0
Miles of routes added to the NFTS within 400 meters of lakes/reservoirs used for foraging	0.56
Miles of ML1 roads converted to trails within 400 meters of lakes/reservoirs used for foraging	0

Cumulative Effects

Appendix B (STF Travel Management DEIS) provides a list and description of past, present, and reasonably foreseeable projects on the STF and private lands within the Forest boundary. Some, but not all, of these activities will contribute to effects upon bald eagles. The primary risks to the bald eagles have been identified as: (1) ingestion of poisonous substances; (2) collision with stationary or moving structures or objects; (3) degradation of wintering or breeding habitat through human development or habitat alteration; and (4) disturbance at nest and roost sites (Birds of North America).

On the STF, increasing recreation use and associated disturbances at reservoirs, and habitat alteration associated with fuels reduction projects, are the primary factors influencing bald eagles or their habitat. Recreation disturbance at known nest locations has been limited through the use of area closures, but boating and campground activity may result in some degree of habitat avoidance by foraging eagles, or may result in avoidance of potential nesting habitats. Reservoirs on the STF vary in size, but typically provide large areas of undisturbed habitat due to the surrounding topography. Since fuels reduction projects are not removing large trees or snags, they are generally not reducing the quality of nesting habitat, and treatments are expected to make habitat more sustainable in the event of a wildfire.

The direct and indirect effects of the project alternatives contribute to two of the four risk factors described above. Alternative 2 has the greatest potential to result in disturbance to nesting and foraging bald eagles since cross-country travel would not be prohibited and vehicles could potentially gain access near foraging areas and nest sites. Since the three action alternatives would only result in small amounts of route near foraging areas and no routes near nest sites,

they would only have very minor impacts to individual foraging bald eagles within the project area. The effects of the action alternatives when combined with the effects of current and future recreation activities may result in minor adverse cumulative effects to some individuals and would not likely measurably impact populations.

Determinations

Alternative 1

This alternative would result in increased amounts of disturbance to nesting and foraging bald eagles within the project area. These impacts would be minimized over the long-term since cross-country travel would be prohibited. Since impacts from this alternative would be limited, seasonal closures would be implemented, and cross-country travel would be prohibited, effects of this alternative would be limited to individual bald eagles. Since the effects of this alternative would be limited to some individuals, bald eagle populations are increasing throughout their range, and the project area represents such a small portion of their range, the effects of this alternative would not likely result in any impacts to the viability of bald eagle populations over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the bald eagle.

Alternative 2

Although this alternative would likely result in increased amounts of disturbance to nesting and foraging bald eagles within the project area, continued route proliferation would ultimately be limited by topography and wilderness areas. Disturbance resulting from this alternative would likely result in adverse impacts to individual bald eagles over the short and long-term. Since bald eagle populations are increasing throughout their range, and the project area represents such a small portion of their range, the effects of this alternative would not likely result in any impacts to the viability bald eagle populations over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the bald eagle.

Alternative 3

Cross-country travel would be prohibited and there would not be any motorized routes added to the NFTS in this alternative. Prohibiting cross-country travel would reduce future disturbance to individual bald eagles over the short and long-term.

Therefore, it is my determination that this alternative would have a "*Beneficial Impact*" on the bald eagle.

Alternative 4

This alternative would result in increased amounts of disturbance to nesting and foraging bald eagles within the project area. These impacts would be minimized over the long-term since cross-country travel would be prohibited. Since impacts from this alternative would be limited, seasonal closures would be implemented, and cross-country travel would be prohibited, effects of this alternative would be limited to individual bald eagles. Since the effects of this alternative would be limited to some individuals, bald eagle populations are increasing throughout their range, and the project area represents such a small portion of their range, the effects of this alternative would not likely result in any impacts to the viability of bald eagle populations over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the bald eagle.

Alternative 5

This alternative would result in increased amounts of disturbance to nesting and foraging bald eagles within the project area. These impacts would be minimized over the long-term since cross-country travel would be prohibited. Since impacts from this alternative would be limited, seasonal closures would be implemented, and cross-country travel would be prohibited, effects of this alternative would be limited to individual bald eagles. Since the effects of this alternative would be limited to some individuals, bald eagle populations are increasing throughout their range, and the project area represents such a small portion of their range, the effects of this alternative would not likely result in any impacts to the viability of bald eagle populations over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the bald eagle.

California Spotted Owl
Strix occidentalis occidentalis

Species and Habitat Account

The California spotted owl (CSO) is one of three recognized subspecies of spotted owls. They are currently found throughout most of their historic range, which primarily occurs on the west side of the Sierra Nevada Mountains of California. The STF is located in the central portion of their range, and they are dispersed throughout the Forest. Surveys for CSOs have been conducted on the Forest for approximately 20 years. Although these surveys have not covered the Forest in its entirety, they have covered a large majority of it. Protected Activity Centers (PACs) are and Home Range Core Areas (HRCAs) are comprised of the best available habitat encompassing approximately 300 and 700 acres respectively. Based on systematic surveys and incidental sightings, there are currently 218 documented Protected Activity Centers (PACs) on the STF. CSOs inhabit a wide variety of forest types generally characterized by dense forest, high canopy closure, high structural diversity, large residual trees, and downed woody debris (Call et al. 1992, Moen and Gutierrez 1997). For the purposes of this analysis, preferred CSO habitat on the STF has been mapped as: CWHR types PPN, SMC, WFR, RFR; classes 5 and 6; canopy closures M and D.

Management Direction

The California spotted owl was identified by the Regional Forester as a Sensitive Species and Management Indicator Species (MIS) on the STF (USDA 2007a, USDA 2007b). The Forest Plan Direction contains the following management direction associated with the proposed project for the California spotted owl:

- Mitigate impacts where there is documented evidence of disturbance to the nest site from existing recreation, off highway vehicle route, trail, and road uses (including road maintenance). Evaluate proposals for new roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb nest sites.

Direct & Indirect Effects

General – All Alternatives

The project alternatives could result in direct and indirect effects to the California spotted owl by:

- Prohibiting cross-country travel off of the NFTS,
- Adding facilities to the NFTS,
- Changing the type of use on NFTS routes,
- Changing the season of use on NFTS routes,
- Implementing mitigation measures.

These actions may have direct and indirect effects on spotted owls through: human-caused mortality, changes in behavior, and habitat modification.

Human-Caused Mortality: Allowing cross-country travel or adding routes to the NFTS may result in collisions with spotted owls. Although it may not be as prevalent in spotted owls as some other bird species, it has been documented. The Cascade Raptor Center (2007) reported that collisions with vehicles were one of the most common problems in northern spotted owls. Collisions with vehicles typically occur along well maintained roadways that allow high rates of travel. Routes proposed for designation within the project alternatives are native surfaced routes that allow much slower rates of travel. These types of routes would result in far fewer, if any collisions.

Changes in Behavior: Types of changes in behavior that may result from the project alternatives include: displacement or avoidance, disturbance at a specific location, or physiological response. The use of motorized vehicles in spotted owl habitat may result in disturbance to owls that are roosting or foraging. The Forest Service, Region 5, has generally assumed that activities (including road and trail use) occurring farther than 0.25 miles from California spotted owl nest sites have little potential to affect owl nesting (USDA 2004). Delaney et al. (1999) found that Mexican spotted owls were found to show an alert response to chainsaws at distances less than 0.25 miles.

Available literature indicates that the likelihood of owls flushing from a nest is greater when disturbance occurs within 60 meters (Delaney et al. 1999, Swarthout and Steidl 2001). Although it is unclear whether these levels of disturbance would result in high levels of stress, Mara and Holberton (1998) found that chronic high levels of stress hormone may have negative effects on reproduction. A study by Wasser et al. (1997) found that stress hormone levels were significantly higher in male northern spotted owls (but not females) when they were located <0.41 km from a major logging road compared to spotted owls in areas >0.41 km from a major logging road. Preliminary study results on a Northern spotted owl study in northern California, indicated that spotted owls did not flush from nest or roost sites when motorcycles were greater than 105 meters away during the post-fledgling period (Delaney and Grubb 2001). In addition, Delaney and Grubb (2003) found that spotted owl responses to motorcycle noise depended upon an array of complex factors including, sound level and frequency distribution, stimulus distance and event duration, motorcycle type and condition, frequency of motorcycle events, number of motorcycles per group, trail slope, topography, road substrate and condition, and microphone position relative to sound source. In general, motorcycle noise did not appear to affect reproductive success. However, this study is ongoing and impacts of motorcycle noise is not conclusive at this point. Without further research, this analysis will assume that effects within 60 meters of an activity center will result in negative effects to reproduction over the short-term. Over the long-term, spotted owls that were experiencing significant disturbance at their current nest site would likely move to another suitable nest site within the PAC.

Habitat Modification: California spotted owls may be affected by edge effects from roads when roads and trails fragment suitable habitat. Several studies indicate the California spotted owl are sensitive to changes in forest canopy closure and habitat fragmentation (Seamans 2005, Blakesley 2003) that could result from a network of roads. Roads and trails can result in a reduction in interior forest patch size which decreases the amount of habitat available and increases the distance between suitable interior forest patches for late-successional species such as the California spotted owl.

Hazard tree removal along NFTS roads has the potential to reduce canopy closure and increase habitat fragmentation for spotted owls. Hazard tree removal is typically conducted along Maintenance Level 2, 3, 4, and 5 roads (not Maintenance Level 1 roads or trails). The project alternatives primarily propose actions on trails and maintenance level (ML) 1 roads. Limited actions that are proposed on ML2, 3, 4, or 5 roads within any of the project alternatives would result in a net reduction in miles of road which hazard trees may be removed along. Therefore, the minor amounts of impact that the project alternatives may have on future hazard tree removal would be beneficial to spotted owl habitat.

Indicators
Based upon the available literature, the following indicators were chosen to provide a relative measure of the direct and indirect effects to the California spotted 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
- Miles of ML1 roads converted to trails within PACs
- Number of PACs intersected by routes added to the NFTS or ML1 roads converted to trails (Percentage of all PACs in Project Area)
- Miles of routes added to the NFTS within 400 meters of Activity Centers
- Miles of ML1 roads converted to trails within 400 meters of Activity Centers
- Number of Activity Centers occurring within 400 meters routes added to the NFTS or ML1 roads converted to trails (Percentage of all Activity Centers in Project Area)
- Number of Activity Centers occurring within 60 meters of routes added to the NFTS or ML1 roads converted to trails (Percentage of all Activity Centers in Project Area)
- Percentage of spotted owl PACs (total acres) occurring within a 400 meter "zone of influence" of routes added to the NFTS or ML1 roads converted to trails
- Percentage of preferred spotted owl habitat occurring within a 400 meter "zone of influence" of routes added to the NFTS or ML1 roads converted to trails

Alternative 1
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 spotted owl activity centers, PACs, and preferred habitat. This would reduce the risk of direct and indirect effects to the spotted owl from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 1, several analyses were completed (Table 20). Standards and guidelines in the Stanislaus National Forest LRMP direct that impacts be mitigated where there is documented evidence of disturbance to the nest site from existing road or motorized trail use. The Forest has not monitored spotted owl nest sites in proximity to roads or trails and has not documented specific instances of disturbance. 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 many of the PACs and those nests that have been located may have moved since it was last located. Furthermore, it is not well known why owls choose certain nest sites from year-to-year but it is likely that the nest sites will continue to move within the PAC over the long-term. Therefore, activity centers may be defined as a nest site, a pair roost location, or a territorial single located within the PAC. In the absence of recent nest site locations for every PAC, the relative risk of project alternatives resulting in disturbance to nesting spotted owls is evaluated by considering: 1) the number of spotted owl activity centers occurring within 400 meters of proposed routes, 2) the number of spotted owl activity centers occurring with 400 meters of ML1 roads that are being converted to trails, 3) the miles of routes that are being added to the NFTS within PACs, and 4) the miles of ML1 roads that are being converted to trails within PACs (Table 20).

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 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 roosting owls. Therefore, this alternative would result in some level of disturbance within approximately 24% of the spotted owl PACs in the project area. As mentioned above, it is assumed that activities greater than 400 meters away have little potential to affect spotted owls. Under this alternative, approximately 15.74% of spotted owl PACs (% of total acres) and 9.83% of preferred spotted owl habitat would occur within the 400 meter "zone of influence". Disturbance

resulting from these actions is likely to result in increased flushing from roosts or perches, increased alarm responses, and increased stress hormone levels in individual spotted owls.

In the absence of further field review, it is assumed that motorized use along all routes within 400 meters of activity centers would result in some disturbance to nesting owls. Therefore, it is assumed that approximately 14% of activity centers would receive some disturbance. Without further research, this analysis will assume that effects within 60 meters of an activity center will result in negative effects to reproduction over the short-term. Therefore, this alternative would result in a greater amount of disturbance and affect reproduction at approximately 1% of the nest sites within the project area. Although these effects would impact individuals and some reproducing pairs over the short-term, they would not result in impacts to populations within the project area over the short or long-term.

Actions proposed in this alternative would result in some indirect effect through habitat modification. The addition of routes to the NFTS within preferred spotted owl habitat and within PAC's 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 spotted owl movement between habitat patches.

Season of Use: Although the exact timing may vary, California spotted owls may start nesting in early March. Therefore, seasonal closures for Zone 2 and Zone 3 (as identified for each route in Appendix I of the STF Travel Management DEIS) would overlap the beginning of the nesting period. Since approximately 80% of the PACs would be within these Zones, these closures would reduce disturbance to those individuals during the early nesting period.

Mitigation Measures: The types of mitigation measures that would be implemented within PACs include: tread hardening, drain dips, fence/log/rock barriers, and hardened stream crossings. The types of mitigation measures that would be implanted within 400 meters of an activity center include: tread hardening, drain dips, and fence/log/rock barriers. Implementation of these mitigation measures would include hand tool and machine work that may result in short-term disturbance to individual foraging or roosting owls within the project area. To prevent potential disturbance to nesting owls, machine work on routes through PACs or within 400 meters of activity centers would not be completed until the end of the nesting season. Disturbance to foraging and roosting owls outside of the nesting season would not likely reduce any individual owl's fitness and would not result in any population level impacts within the project area.

Table 20. California Spotted Owl: Direct and Indirect Effects Indicators - Alternative 1

Alternative 1 - California Spotted Owl - Direct and Indirect Effects Indicators	
Miles of routes added to the NFTS within PACs	20.34
Miles of ML1 roads converted to trails within PACs	4.23
Number of PACs intersected by routes added to the NFTS or ML1 roads converted to trails (Percentage of all PACs in Project Area)	53 (24%)
Miles of routes added to the NFTS within 400 meters of Activity Centers	6.67
Miles of ML1 roads converted to trails within 400 meters of Activity Centers	1.47
Number of Activity Centers occurring within 400 meters routes added to the NFTS or ML1 roads converted to trails (Percentage of all Activity Centers in Project Area)	30 (14%)
Number of Activity Centers occurring within 60 meters of routes added to the NFTS or ML1 roads converted to trails (Percentage of all Activity Centers in Project Area)	2 (1%)

Percentage of spotted owl PACs (total acres) occurring within a 400 meter "zone of influence" of routes added to the NFTS or ML1 roads converted to trails	16%
Percentage of preferred spotted owl habitat occurring within a 400 meter "zone of influence" of routes added to the NFTS or ML1 roads converted to trails	10%

Alternative 2
Cross-Country Travel: Cross-country travel would not be prohibited under this alternative. Therefore it is assumed that route proliferation would continue over the short and long-term and the effects would be similar to those discussed below for adding routes to the NFTS.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: Although this alternative would not result in the addition of any miles of unauthorized routes to the NFTS, vehicles would be allowed to use all existing motorized trails because cross-country travel would be allowed. Therefore, it is assumed that wheeled motorized vehicles will continue to use all of the documented unauthorized routes previously identified and continue to create new routes. The use of these routes and the continued proliferation of new routes would result in increasing amounts of direct and indirect effects to spotted owls. These effects would be similar to those discussed within Alternative 4 for the short-term, but would be exacerbated over the long-term by the continued proliferation of routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would reduce potential disturbance to spotted owls.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 3
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 spotted owl activity centers, PACs, and preferred habitat. This would reduce the risk of direct and indirect effects to the spotted owl from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: This alternative would not result in the addition of any motorized routes to the NFTS, nor would it change the type of use on any current NFTS routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would reduce potential disturbance to spotted owls.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 4
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 spotted owl activity centers, PACs, and preferred habitat. This would reduce the risk of direct and indirect effects to the spotted owl from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 4, several analyses were completed (Table 21). Direct and indirect effects of the actions proposed in this alternative would be similar to those discussed in Alternative 1. For further discussion regarding those effects please see

discussion above. In the absence of further field review, it is assumed that motorized use along all routes within 400 meters of activity centers would result in some disturbance to nesting owls. Therefore, it is assumed that approximately 16% of nest sites would receive some disturbance. Without further research, this analysis will assume that effects within 60 meters of an activity center will result in negative effects to reproduction over the short-term. Therefore, this alternative would result in a greater amount of disturbance and affect reproduction at approximately 1% of the activity centers within the project area. Since there is a slight increase from Alternative 1 in the number of routes added to the system or converted to a trail within PACs, near activity centers, and within preferred habitat, there would be a slight increase in the direct and indirect effects to individual spotted owls within the project area. Although these effects would impact individuals and some reproducing pairs over the short-term, they would not result in impacts to populations within the project area over the short or long-term.

Season of Use: Although the exact timing may vary, California spotted owls may start nesting in early March. Therefore, seasonal closures for Zone 2 and Zone 3 (as identified for each route in Appendix I of the STF Travel Management DEIS) would overlap the beginning of the nesting period. Since approximately 80% of the PACs would be within these Zones, these closures would reduce disturbance to those individuals during the early nesting period.

Mitigation Measures: The effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 21. California Spotted Owl: Direct and Indirect Effects Indicators - Alternative 4

Alternative 4 - California Spotted Owl - Direct and Indirect Effects Indicators	
Miles of routes added to the NFTS within PACs	24.56
Miles of ML1 roads converted to trails within PACs	6.21
Number of PACs intersected by routes added to the NFTS or ML1 roads converted to trails (Percentage of all PACs in Project Area)	58 (27%)
Miles of routes added to the NFTS within 400 meters of Activity Centers	8.02
Miles of ML1 roads converted to trails within 400 meters of Activity Centers	1.81
Number of Activity Centers occurring within 400 meters of routes added to the NFTS or ML1 roads converted to trails (Percentage of all Activity Centers in Project Area)	34 (16%)
Number of Activity Centers occurring within 60 meters routes added to the NFTS or ML1 roads converted to trails (Percentage of all Activity Centers in Project Area)	3 (1%)
Percentage of spotted owl PACs (total acres) occurring within a 400 meter “zone of influence” of routes added to the NFTS or ML1 roads converted to trails	18%
Percentage of preferred spotted owl habitat occurring within a 400 meter “zone of influence” of routes added to the NFTS or ML1 roads converted to trails	11%

Alternative 5

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 spotted owl activity centers, PACs, and preferred habitat. This would reduce the risk of direct and indirect effects to the spotted owl from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 5, several analyses were completed (Table 22). Direct and indirect effects of the actions proposed in this alternative would be similar to those discussed in Alternative 1. For further discussion regarding those effects please see discussion above. In the absence of further field review, it is assumed that motorized use along all routes within 400 meters of activity centers would result in some disturbance to nesting owls. Therefore, it is assumed that approximately 2% of nest sites would receive some disturbance. Without further research, this analysis will assume that effects within 60 meters of an activity center will result in negative effects to reproduction over the short-term. This alternative would not result in increased amounts of motorized use within 60 meters of any activity centers. Since there is a decrease from Alternative 1 in the number of routes added to the system or converted to a trail within PACs, near activity centers, and within preferred habitat, there would be a decrease in the direct and indirect effects to individual spotted owls within the project area. Although these effects would impact individuals over the short-term, they would not result in impacts to populations within the project area over the short or long-term.

Season of Use: Although the exact timing may vary, California spotted owls may start nesting in early March. Therefore, seasonal closures for Zone 2 and Zone 3 (as identified for each route in Appendix I of the STF Travel Management DEIS) would overlap the beginning of the nesting period. Since approximately 80% of the PACs would be within these Zones, these closures would reduce disturbance to those individuals during the early nesting period.

Mitigation Measures: The effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 22. California Spotted Owl: Direct and Indirect Effects Indicators - Alternative 5

Alternative 5 - California Spotted Owl - Direct and Indirect Effects Indicators	
Miles of routes added to the NFTS within PACs	0.43
Miles of ML1 roads converted to trails within PACs	0.09
Number of PACs intersected by routes added to the NFTS or ML1 roads converted to trails (Percentage of all PACs in Project Area)	4 (2%)
Miles of routes added to the NFTS within 400 meters of Activity Centers	0.03
Miles of ML1 roads converted to trails within 400 meters of Activity Centers	0
Number of Activity Centers occurring within 400 meters of routes added to the NFTS or ML1 roads converted to trails (Percentage of all Activity Centers in Project Area)	1 (<1%)
Number of Activity Centers occurring within 60 meters routes added to the NFTS or ML1 roads converted to trails (Percentage of all Activity Centers in Project Area)	0 (0%)
Percentage of spotted owl PACs (total acres) occurring within a 400 meter “zone of influence” of routes added to the NFTS or ML1 roads converted to trails	2%
Percentage of preferred spotted owl habitat occurring within a 400 meter “zone of influence” of routes added to the NFTS or ML1 roads converted to trails	1%

Cumulative Effects

In its 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 (USDI 2006). Appendix B (STF Travel Management DEIS) provides a list and description of past, present, and reasonably foreseeable projects on the STF and private lands within the STF boundary. Some, but not all, of these activities will contribute to effects upon California spotted owls.

Based on GIS analysis, 14 wildfires have burned through 17 or 8% of spotted owl PACs affecting approximately 971acres or 2% of those PACs since 2000. Forest vegetation/fuels thinning projects (designed to reduce the risk of additional habitat loss to wildfires) have treated within approximately 1,410 acres or 2% of spotted owl PACs between 2000 and 2008. CDF currently lists a total of 2,365 acres of private land within the STF administrative boundary for which timber harvest plans have been submitted. Timber harvest on private lands is generally more intensive and does not typically maintain habitat suitability for spotted owls. These wildfires and fuels treatment projects have resulted in reduction in the amount and quality of spotted owl habitat on the STF.

Vegetation/fuels reduction projects will continue to be the primary activity affecting spotted owl habitat on the STF (Appendix B STF Travel Management DEIS). These projects will likely occur on an estimated 3,500 acres per year, based upon the acreage treated in 2006. Although these treatments will degrade habitat, it is anticipated that over time, the amount of habitat removed in stand replacing wildfires will be reduced as a result of these treatments (USDA 2004).

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 (USDA 2004) or the USDI (2006). 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 2 may, over time, contribute to cumulative effects upon spotted owl populations. Because Alternative 2 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 2 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 4, 1, 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 increases in recreation uses and OHV activity, the alternatives may result in minor cumulative impacts when combined with other factors affecting 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).

Determinations

Alternative 1

This alternative would result in increased amounts of disturbance and minor habitat fragmentation within the project area, but would be limited over the long-term since cross-country travel would be prohibited. Disturbance resulting from this alternative would likely result in adverse impacts to some pairs and individual spotted owls. Since California spotted owls are widespread throughout the project area, effects would be limited to a small percentage of the activity centers, and cross-country travel would be prohibited, these effects would not likely result in any impacts to California spotted owl populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the California spotted owl.

Alternative 2
Although this alternative would result in increased amounts of disturbance and habitat fragmentation within the project area, continued route proliferation would ultimately be limited by topography and wilderness areas. Disturbance resulting from this alternative would likely result in adverse impacts to individual California spotted owls. Increased habitat fragmentation from route proliferation would likely result in impacts to individuals over the short-term and long-term. California spotted owls are distributed throughout the project area and throughout the central Sierra Nevada Mountains. Therefore, population level impacts would be minor and would not threaten the long-term viability of the species.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the California spotted owl.

Alternative 3
Since this alternative would not result in the addition of any routes to the NFTS, there would not be any direct or indirect effects to spotted owls over the short-term. Since cross-country travel would be prohibited, disturbance would be decreased over the long-term and all unauthorized routes within PACs and emphasis habitat would slowly rehabilitate. The rehabilitation of these routes would result in minor improvements to California spotted owl habitat over the long-term.

Therefore, it is my determination that this alternative would have a "*Beneficial Impact*" on the California spotted owl.

Alternative 4
This alternative would result in increased amounts of disturbance and minor habitat fragmentation within the project area, but would be limited over the long-term since cross-country travel would be prohibited. Disturbance resulting from this alternative would likely result in adverse impacts to some pairs and individual spotted owls. Since California spotted owls are widespread throughout the project area, effects would be limited to a small percentage of the activity centers, and cross-country travel would be prohibited, these effects would not likely result in any impacts to California spotted owl populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the California spotted owl.

Alternative 5
This alternative would result in increased amounts of disturbance some individuals within the project area, but would be limited over the long-term since cross-country travel would be prohibited. Since California spotted owls are widespread throughout the project area, effects would be limited to a small percentage of the activity centers, and cross-country travel would be prohibited, these effects would not likely result in any impacts to California spotted owl populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the California spotted owl.

Great Gray Owl
Strix nebulosa

Species and Habitat Account
The great gray owl is a large nocturnal owl that is not easily observed. It is found in the boreal climatic zones of North America from Alaska to central California (Collins 1980, Mikkola 1983).

The population that inhabits California represents the southern extent of its range (van Riper III and Wagtendonk 2006). Yosemite National Park and the STF currently represent the core range of the great gray owl in California. There are currently 21 documented great gray owl PACs on the STF, which are primarily located on the southern portion of the Forest. Great gray owl PACs are defined as "at least 50 acres of the highest quality nesting habitat available in the forested area surrounding nests and the meadow or meadow complex that support a prey base for the nesting owls" (USDA 2004). Although there are 21 designated PACs within the project area, activity centers have only been designated for 12 of them. PACs that do not currently have a designated activity center have not had any documented activity for a significant period of time. Activity centers for the PACs may not necessarily be nest sites, but may be the location of a roost site or territorial call. This data may vary significantly in its accuracy, but it is currently considered the best available information and provides a means by which to evaluate the relative impacts of each of the project alternatives.

Great gray owls are found in mixed conifer forests, but are highly dependent upon meadows for foraging habitat (Winter 1981). A radio telemetry study in and around Yosemite National Park found that over 80% of the owl relocations were within 200 meters of meadows (Winter 1982). For this analysis, great gray owl emphasis habitat will be defined as meadows greater than 15 acres that are within 5 miles of existing PACs. Since great gray owls have been found to prefer areas within 200 meters of meadows, a 200 meter buffer will be applied to these meadows and included in the emphasis habitat. The results of this habitat delineation indicated that there are approximately 3,077 acres of meadows and a total of approximately 13,971 acres of emphasis habitat (includes buffer acres) within the project area.

Management Direction

The great gray owl was identified by the Regional Forester as a Sensitive Species on the STF (USDA 2007a). The Forest Plan Direction does not provide any specific management direction related to this project for the great gray owl.

Direct & Indirect Effects

General – All Alternatives

The project alternatives could result in direct and indirect effects to the great gray owl by:

- Prohibiting cross-country travel off of the NFTS,
- Adding facilities to the NFTS,
- Changing the type of use on NFTS routes,
- Changing the season of use on NFTS routes,
- Implementing mitigation measures.

These actions may have direct and indirect effects on owls through: human-caused mortality, changes in behavior, and habitat modification.

Human-Caused Mortality: Collisions with motor vehicles have been documented in several locations and have been a significant source of trauma and mortality in some areas (USDA 2004). The Cascades Raptor Center (2007) reported that collisions with vehicles "was the greatest cause of mortality" in great gray owls. There have been at least two reported collisions near the project area on Highways 120 and 140. Collisions with vehicles typically occur along well maintained roadways that allow high rates of travel. Routes proposed for designation within the project alternatives are native surfaced routes that allow much slower rates of travel. These types of routes would result in far fewer, if any collisions.

Changes in Behavior: Although there is very little documented information regarding disturbance from human activity to great gray owls, it will be assumed that great gray owls would respond to noise and human disturbance in much the same way as other owls. Therefore, changes in behavior are anticipated to be similar to those disclosed in the California spotted owl analysis. The Forest Service, Region 5, has generally assumed that activities (including road and trail use) occurring farther than 0.25 miles from California spotted owl nest sites have little potential to

affect owl nesting (USDA 2004). The miles of routes that will be added to the NFTS with 0.25 miles of activity centers will be determined for each of the alternatives. Although activity centers have not been documented for each of the PACs and all of the activity centers may not be known nest sites, this analysis will serve as an indicator of the amount of disturbance that may occur to nest sites.

Habitat Modification: The use of meadows for nest sites or foraging is likely affected by the quality of the meadow habitat. Meadow habitat quality may be affected numerous different ways by motorized travel. The most obvious way motorized vehicles may impair meadow quality is through direct mechanical damage (rutting). Since soil typically has lower bulk density and can be more easily penetrated when it is wet, mechanical damage often occurs in meadows that are naturally wet or in dry meadows after significant rainfall or immediately following the retreat of the snow at higher elevations. When roads or trails are created in meadows they may intercept surface and subsurface flow (Kattelmann 1996). When flows are intercepted and redirected, meadow drying occurs, changing the fauna and flora associated with it.

Changing the faunal community within meadows may impact quantity and quality of great gray owl foraging. Two species that have been noted as being important prey items to great gray owls are microtines and pocket gophers (Franklin 1988, Winter 1981, Winter 1982). Winter (1981) and (1982) found that microtines may be a preferred prey item for great gray owls in the Sierra Nevada area and may be essential for successful reproduction. He further suggested that Microtus were also associated with moist areas that had good grass cover. Therefore, slight shifts in meadow hydrology caused by motorized travel may impact suitable habitat for mictrotines; thereby potentially adversely affecting the quantity and quality of great gray owl prey.

Indicators
Based upon the available literature, the following indicators were chosen to provide a relative measure of the direct and indirect effects to the great gray 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 PAC's
- Miles of ML1 roads converted to trails within PAC's
- Number of PAC's intersected by routes added to the NFTS or ML1 roads converted to trails (Percentage of all PAC's in Project Area)
- Miles of routes added to the NFTS within 400 meters of Activity Centers
- Miles of ML1 roads converted to trails within 400 meters of Activity Centers
- Miles of routes added to the NFTS within emphasis habitat
- Miles of ML1 roads converted to trails within emphasis habitat

Alternative 1
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, PACs, and emphasis habitat. This would reduce the risk of direct and indirect effects to the great gray owl from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct effects from adding routes to the NFTS, two analyses were completed: 1) miles of routes that would be added to the NFTS within great gray owl PACs and, 2) miles of routes that would be added to the NFTS within 400 meters of documented great gray owl activity centers (Table 28). Alternative 1 would result in the addition of 0.56 miles of motorized routes to 2 separate great gray owl PACs (Crocker Meadow and Ackerson 3) and 0.28 miles of routes within 400 meters of one Activity Center (Table 23). Although the Crocker Meadow and Ackerson 3 PACs have not had any recently documented activity, great gray owls use the entire Ackerson meadow complex and the addition of these routes may increase disturbance to some

individual great gray owls within the project area. Increases in disturbance resulting from the addition of these routes would not likely be significant enough to reduce any individual owl's fitness; therefore, it would not result in any population level impacts to the great gray owl.

To determine the relative risk of the indirect effects of adding routes to the NTS, two analyses were completed: 1) miles of routes that would be added to the NFTS within great gray owl PACs and, 2) miles of routes added to the NFTS within great gray owl emphasis habitat. Field surveys were completed on the routes that proposed to be added to the NFTS within the PACs. The route that was proposed to be added within the Crocker Meadow PAC does not cross any streams nor does it enter the meadow. Therefore, the addition of this route to the NFTS would not have significant impacts to the hydrology of the meadow. One of the routes that were proposed to be added to the NFTS within the Ackerson 3 PAC crosses a small unnamed tributary to Ackerson Creek. The route and the crossing are not within the meadow. The addition of this route would not likely result in significant impacts to the hydrology of the meadow complex. If GIS analysis indicated that a route within great gray owl emphasis habitat crossed a stream, a field survey was completed on the route. The GIS analysis indicated that there were two routes (FR98514 and FR98486) within great gray owl emphasis habitat that crossed streams. After completing field surveys on these routes it was determined that they would not result in any adverse impact to the hydrology of the meadows.

Season of Use: Although the exact timing may vary, great gray owls start nesting near the month of March. Since seasonal closures for Zone 2 and Zone 3 (as identified for each route in Appendix I of the STF Travel Management DEIS) would overlap the beginning of the nesting period and approximately 90% of the great gray owl PACs would be within these Zones, these closures would reduce disturbance to those individuals returning to their breeding territories and starting to nest.

Mitigation Measures: The only type of mitigation measure that would be implemented within PACs is no-dig barriers. There would not be any mitigation measures implemented within 400 meters of activity centers. The installation of no-dig barriers would be completed with hand tools and would not likely result in any disturbance to owls within the PAC.

Table 23. Great Gray Owl: Direct and Indirect Effects Indicators - Alternative 1

Alternative 1 - Great Gray Owl - Direct and Indirect Effects Indicators	
Miles of routes added to the NFTS within PAC's	0.56
Miles of ML1 roads converted to trails within PAC's	0.24
Number of PAC's intersected by routes added to the NFTS or ML1 roads converted to trails (Percentage of all PAC's in Project Area)	3 (14%)
Miles of routes added to the NFTS within 400 meters of Activity Centers	0.28
Miles of ML1 roads converted to trails within 400 meters of Activity Centers	0
Miles of routes added to the NFTS within emphasis habitat	1.63
Miles of ML1 roads converted to trails within emphasis habitat	1.16

Alternative 2

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

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: Although this alternative would not result in the addition of any miles of unauthorized routes to the NFTS, vehicles would be allowed to use all existing motorized trails because cross-country travel would be allowed. Therefore, it is assumed that wheeled motorized vehicles will continue to use all of the documented unauthorized routes previously identified and continue to create new routes. 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. These effects would be similar to those discussed within Alternative 4 for the short-term, but would be exacerbated over the long-term by the continued proliferation of routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would reduce potential disturbance to great gray owls.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 3

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

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: This alternative would not result in the addition of any motorized routes to the NFTS, nor would it change the type of use on any current NFTS routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would reduce potential disturbance to great gray owl.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 4

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

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 4, several analyses were completed (Table 24). Direct and indirect effects of the actions proposed in this alternative would be similar to those discussed in Alternative 1. The only exception is that there would be an additional 0.08 miles of routes added to the NFTS within great gray owl emphasis habitat. GIS analysis indicated that this route would not cross any streams nor would it impact the hydrology of the meadow.

Season of Use: Although the exact timing may vary, great gray owls start nesting near the month of March. Since seasonal closures for Zone 2 and Zone 3 (as identified for each route in Appendix I of the STF Travel Management DEIS) would overlap the beginning of the nesting period and approximately 90% of the great gray owl PACs would be within these Zones, these closures would reduce disturbance to those individuals returning to their breeding territories and starting to nest.

Mitigation Measures: The effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 24. Great Gray Owl: Direct and Indirect Effects Indicators - Alternative 4

Alternative 4 - Great Gray Owl - Direct and Indirect Effects Indicators	
Miles of routes added to the NFTS within PAC's	0.56
Miles of ML1 roads converted to trails within PAC's	0.24
Number of PAC's intersected by routes added to the NFTS or ML1 roads converted to trails (Percentage of all PAC's in Project Area)	3 (14%)
Miles of routes added to the NFTS within 400 meters of Activity Centers	0.28
Miles of ML1 roads converted to trails within 400 meters of Activity Centers	0
Miles of routes added to the NFTS within emphasis habitat	1.71
Miles of ML1 roads converted to trails within emphasis habitat	1.19

Alternative 5

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

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 5, several analyses were completed (Table 25). This Alternative would not result in the addition of any routes to the NFTS within great gray owl PACs or within 400 meters of Activity Centers. Therefore, this Alternative would not likely result in any direct effects to the great gray owl. This Alternative would result in the addition of 0.53 miles of routes to NFTS within emphasis habitat. GIS analysis indicated that this route would not cross any streams nor would it impact the hydrology of the meadow. Therefore, this Alternative would not result in any adverse impacts to great gray owl emphasis habitat; therefore, it would not likely have any indirect effect to the great gray owl.

Season of Use: Although the exact timing may vary, great gray owls start nesting near the month of March. Since seasonal closures for Zone 2 and Zone 3 (as identified for each route in Appendix I of the STF Travel Management DEIS) would overlap the beginning of the nesting period and approximately 90% of the great gray owl PACs would be within these Zones, these closures would reduce disturbance to those individuals returning to their breeding territories and starting to nest.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Table 25. Great Gray Owl: Direct and Indirect Effects Indicators - Alternative 5

Alternative 5 - Great Gray Owl - Direct and Indirect Effects Indicators	
Miles of routes added to the NFTS within PAC's	0
Miles of ML1 roads converted to trails within PAC's	0

Number of PAC's intersected by routes added to the NFTS or ML1 roads converted to trails (Percentage of all PAC's in Project Area)	0
Miles of routes added to the NFTS within 400 meters of Activity Centers	0
Miles of ML1 roads converted to trails within 400 meters of Activity Centers	0
Miles of routes added to the NFTS within emphasis habitat	0.53
Miles of ML1 roads converted to trails within emphasis habitat	0

Cumulative Effects

Appendix B (STF Travel Management DEIS) provides a list and description of past, present, and reasonably foreseeable projects on the STF and private lands within the Forest boundary. 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. During the past century, the widespread removal of large trees from mature and old growth forest has reduced the abundance of potential nest trees, fire suppression has allowed meadow foraging habitats to decrease in size, and livestock grazing altered meadow hydrology, potentially reducing prey abundance (Verner 1994).

Livestock grazing occurs on 35 active grazing allotments on the STF, totaling approximately 792,042 acres of NFS and private lands. In some meadows, livestock grazing has reduced the suitability of meadow vegetation for microtine rodents and other great gray owl prey (USDA 2001). On the STF, the impacts of livestock grazing on meadows is variable between years, but has been steadily decreasing as forage utilization levels are being reduced by stricter standards established by the Sierra Nevada Forest Plan Amendment. Furthermore, some meadows within PACs are protected by grazing exclosures designed to reduce the impacts of grazing and improve cover for great gray owl prey. Although improvements have been made, livestock grazing has historically and may continue to have cumulative effects on cover for great gray owl prey within meadows in the project area.

Although human disturbance has not been recognized as a significant threat to great gray owls, the use of motorized vehicles in meadow habitats can have significant impacts to meadow hydrology and the associated flora and fauna. The greatest risk of impacts to great gray owls and their habitats is in Alternative 2 since it would not prohibit cross-country travel and meadows are often easily accessed by vehicles. Therefore, the direct and indirect effects of Alternative 2 and the effects of continued livestock grazing may have significant impacts to individuals. Although the population of great gray owls within the project area is not precisely known, it is known to be relatively small with a limited distribution. Impacts to meadows that maybe associated with unabated cross-country travel would likely impact enough individuals to result in measurable reductions to the population size within the project area.

The direct and indirect effects of motorized routes within meadows in Alternatives 1, 4, and 5, combined with the effects of past and continued livestock grazing, may adversely affect meadow habitats and associated species (as described above). 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 any individuals fitness or populations with the project area.

Determinations

Alternative 1

The addition of routes within two PACs and within 400 meters of one activity center may result in some direct effects through minor amounts of disturbance to some individual owls. Field surveys

indicated that indirect effects would be limited since routes within PACs and great gray owl emphasis habitat would not result in adverse impacts to meadow hydrology. Although the distribution of great gray owls is limited in the Sierra Nevada's, effects would only occur within two PACs and near one activity center. Since cross-country travel would be prohibited, wide-scale seasonal closures would be implemented, and potential disturbance would be minor, the effects of this alternative would not likely result in any impacts to the viability of great gray owl populations over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the great gray owl.

Alternative 2
Although this alternative would not result in the addition of any routes to the NFTS, cross-country travel would not be prohibited and route proliferation would continue to occur. Meadows and near-bye forested areas provide critical habitat for great gray owls and are easily accessed by off-road vehicles. Since meadows are easily accessed and a desirable location for camping and other forest visitors, routes would likely be proliferated in and near many of the meadows within the project area over the long-term. This would result in direct effects through increased disturbance to nesting and foraging owls over the short and long-term. Route proliferation in meadows would also likely result in indirect effects to owls through impacts to meadow hydrology over the short-term and impacts to their prey base over the long-term. These direct and indirect effects would likely result in great gray owl population declines within the project area over the long-term. Since great gray owl distribution is limited in the Sierra Nevada's and the project area represents a significant portion of their current range, unabated impacts to meadow habitats occurring from continued route proliferation would likely result in impacts to great gray owl populations over the long-term.

Therefore, it is my determination that this alternative "*would impact individuals or habitat with a consequence that the action would contribute to a trend towards federal listing or cause a loss of viability to the population or species*" for the great gray owl.

Alternative 3
Since this alternative would not result in the addition of any routes to the NFTS, there would not be any direct or indirect effects to great gray owls over the short-term. Since cross-country travel would be prohibited, disturbance would be decreased over the long-term and all unauthorized routes within PACs and emphasis habitat would slowly rehabilitate. Although there are only a limited number of unauthorized routes in these areas, the rehabilitation of these routes would result in minor improvements to great gray owl habitat over the long-term.

Therefore, it is my determination that this alternative would have a "*Beneficial Impact*" on the great gray owl.

Alternative 4
The addition of routes within two PACs and within 400 meters of one activity center may result in some direct effects through minor amounts of disturbance to some individual owls. Field surveys indicated that indirect effects would be limited since routes within PACs and great gray owl emphasis habitat would not result in adverse impacts to meadow hydrology. Although the distribution of great gray owls is limited in the Sierra Nevada's, effects would only occur within two PACs and near one activity center. Since cross-country travel would be prohibited, wide-scale seasonal closures would be implemented, and potential disturbance would be minor, the effects of this alternative would not likely result in any impacts to the viability of great gray owl populations over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the great gray owl.

Alternative 5
Since this alternative would not result in the addition of any routes to the NFTS within PAC's or near activity centers, there would not be any direct or indirect effects to great gray owls over the short-term. Since cross-country travel would be prohibited, disturbance would be decreased over the long-term and all unauthorized routes within PACs would slowly rehabilitate. Since there is only one route within emphasis habitat and the remaining unauthorized routes would likely rehabilitate over the long-term, this alternative would likely result in minor improvements to great gray owl habitat over the long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the great gray owl.

Northern Goshawk
Accipiter gentilis

Species and Habitat Account
The northern goshawk is a large raptor that is found throughout forested habitats of the western United States (Squires and Reynolds 1997). Although goshawks remain widely distributed throughout their historic range, current sampling techniques are inadequate to determine population status or trends of this species (63 FR 35183). It is estimated that there are around 600 known goshawk territories on National Forest System lands in the Sierra Nevada (USDA 2001). Surveys for goshawks have been conducted on the Forest for approximately 20 years. Although these surveys have not covered the Forest in its entirety, they have covered a large majority of it. Protected Activity Centers (PACs) are comprised of the best available habitat encompassing approximately 200 acres. Based on systematic surveys and incidental sightings, there are currently 76 documented PACs on the STF.

Suitable goshawk habitat in the Sierra Nevada consists of dense, multi-layered mature forested stands with dense canopy cover for nesting, and dense to moderately open overstories, and open understories interspersed with meadows, shrub patches, riparian area, or other openings for foraging. Goshawks use nest-sites with greater canopy cover, greater basal area, greater numbers of large diameter trees, and lower shrub/understory cover relative to random sites. High canopy cover is the most consistent structural feature similar across studies of northern goshawk nesting habitat. Goshawks typically nest in stands with canopy cover between 60% and 80% (Keane 1999, Maurer 2000).

Management Direction
The northern goshawk was identified by the Regional Forester as a Sensitive Species on the STF (USDA 2007a). The Forest Plan Direction contains the following management direction associated with the proposed project for the northern goshawk:

- Mitigate impacts where there is documented evidence of disturbance to the nest site from existing recreation, off highway vehicle route, trail, and road uses (including road maintenance). Evaluate proposals for new roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb nest sites.

Direct & Indirect Effects
General - All Alternatives
The project alternatives could result in direct and indirect effects to the northern goshawk by:

- Prohibiting cross-country travel off of the NFTS,

- Adding facilities to the NFTS,
- Changing the type of use on NFTS routes,
- Changing the season of use on NFTS routes,
- Implementing mitigation measures.

These actions may have direct and indirect effects on goshawks through: changes in behavior and habitat modification.

Changes in Behavior: Types of changes in behavior that may result from the project alternatives include: displacement or avoidance, disturbance at a specific location, or physiological response. Critical times for human disturbance are through the nesting and post fledging period (February 15 through September 15). Because goshawks initiate breeding when the ground is still covered with snow and roads and trails are not in use, nests are sometimes directly located along roads and trails that provide flight access. Following melt-out these sites can be prime candidates for conflict as humans begin using the roads and trails (USDA 2001). Northern goshawks are aggressive nest defenders that will attack humans that venture into active nest stands. The potential for negative human interactions increases where motorized routes or dispersed campsites are in proximity to goshawk nest stands (USDA 2001).

The Forest Service, Region 5, has generally assumed that activities (including road and trail use) occurring farther than 0.25 miles from a goshawk nest site have little potential to affect goshawk nesting (USDA 2004). Grubb et al. (1998) reported that vehicle traffic from roads caused no discernable behavioral response by goshawks at distances greater than 400 meters (0.25 miles) from nests. Little information is available on disturbance distances for goshawks but, as with other raptors, the risk of flushing from the nest or even nest abandonment is likely to increase as the disturbance distance decreases.

Habitat Modification: Northern goshawks may be affected by edge effects from roads when roads and trails fragment suitable habitat. Several studies indicate that goshawks are sensitive to changes in forest canopy closure and habitat fragmentation that could result from a network of roads (Beir and Drennan 1997, Daw and DeStefano 2001). Roads and trails can result in a reduction in interior forest patch size which decreases the amount of habitat available and increases the distance between suitable interior forest patches for late-successional species such as the goshawk.

Hazard tree removal along NFTS roads has the potential to reduce canopy closure and increase habitat fragmentation for goshawks. Hazard tree removal is typically conducted along Maintenance Level 2, 3, 4, and 5 roads (not Maintenance Level 1 roads or trails). The project alternatives primarily propose actions on trails and maintenance level (ML) 1 roads. Limited actions that are proposed on ML2, 3, 4, or 5 roads within any of the project alternatives would result in a net reduction in miles of road which hazard trees may be removed along. Therefore, the minor amounts of impact that the project alternatives may have on future hazard tree removal would be beneficial to goshawk habitat.

Indicators

Based upon the available literature, the following indicators were chosen to provide a relative measure of the direct and indirect effects to the northern goshawk. 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.
- Miles of ML1 roads converted to trails within PACs.
- Number of PACs intersected by routes added to the NFTS or ML1 roads converted to trails (Percentage of all PACs in Project Area).
- Miles of routes added to the NFTS within 400 meters of Activity Centers.
- Miles of ML1 roads converted to trails within 400 meters of Activity Centers.

- Number of Activity Centers occurring within 400 meters routes added to the NFTS or ML1 roads converted to trails (Percentage of all Activity Centers in Project Area).
- Percentage of goshawk PACs (total acres) occurring within a 400 meter "zone of influence" of routes added to the NFTS or ML1 roads converted to trails.

Alternative 1

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, PACs, and preferred habitat. This would reduce the risk of direct and indirect effects to goshawks from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 1, several analyses were completed (Table 26). Standards and guidelines in the Stanislaus National Forest LRMP direct that impacts be mitigated where there is documented evidence of disturbance to the nest site from existing road or motorized trail use. The Forest has not monitored goshawk nest sites in proximity to roads or trails and has not documented specific instances of disturbance. 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 many of the PACs and those nests that have been located may have moved since it was last located. Furthermore, it is not well known why goshawks choose certain nest sites from year-to-year but it is likely that the nest sites will continue to move within the PAC over the long-term. Therefore, activity centers may be defined as a nest site, a pair roost location, or a territorial single located within the PAC. In the absence of recent nest site locations for every PAC, the relative risk of project alternatives resulting in disturbance to nesting goshawks is evaluated by considering: 1) the number of goshawk activity centers occurring within 400 meters of proposed routes, 2) the number of goshawk activity centers occurring with 400 meters of ML1 roads that are being converted to trails, 3) the miles of routes that are being added to the NFTS within PACs, and 4) the miles of ML1 roads that are being converted to trails within PACs (Table 26).

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 12% of the goshawk PACs in the project area. As mentioned above, it is assumed that activities greater than 400 meters away have little potential to affect goshawks. Under this alternative, approximately 10% of goshawk PACs (% of total acres) would occur within the 400 meter "zone of influence". Disturbance resulting from these actions is likely to result in increased flushing from roosts or perches, increased alarm responses, and increased stress hormone levels in some individual goshawks.

In the absence of further field review, it is assumed that motorized use along all routes within 400 meters of activity centers would result in some disturbance to nesting goshawks. Therefore, it is assumed that approximately 9% of nest sites would receive some disturbance. Although these effects would impact individuals and some reproducing pairs over the short-term, they would not result in impacts to populations within the project area over the short or long-term.

Actions proposed in this alternative would result in some indirect effect 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.

Season of Use: Although the exact timing may vary, goshawks may start nesting in February. Therefore, seasonal closures for Zone 2 and Zone 3 (as identified for each route in Appendix I of the STF Travel Management DEIS) would overlap the beginning of the nesting period. Since approximately 96% of the goshawk PACs would be within these Zones, these closures would reduce disturbance to most goshawks during the early nesting period.

Mitigation Measures: The types of mitigation measures that would be implemented within PACs and within 400 meters of activity centers include: tread hardening, drain dips, and fence/log/rock barriers. Implementation of these mitigation measures would include hand tool and machine work that may result in short-term disturbance to individual foraging or roosting goshawks within the project area. To prevent potential disturbance to nesting goshawks, machine work on routes through PACs or within 400 meters of activity centers would not be completed until the end of the nesting season. Disturbance to foraging and roosting goshawks outside of the nesting season would not likely reduce any individual goshawk's fitness and would not result in any population level impacts within the project area.

Table 26. Northern Goshawk: Direct and Indirect Effects Indicators - Alternative 1

Alternative 1 - Northern Goshawk - Direct and Indirect Effects Indicators	
Miles of routes added to the NFTS within PACs	0.94
Miles of ML1 roads converted to trails within PACs	0.91
Number of PACs intersected by routes added to the NFTS or ML1 roads converted to trails (Percentage of all PACs in Project Area)	9 (12%)
Miles of routes added to the NFTS within 400 meters of Activity Centers	0.61
Miles of ML1 roads converted to trails within 400 meters of Activity Centers	0.99
Number of Activity Centers occurring within 400 meters of routes added to the NFTS or ML1 roads converted to trails (Percentage of all Activity Centers in Project Area)	7 (9%)
Percentage of PACs (total acres) occurring within a 400 meter "zone of influence" of routes added to the NFTS or ML1 roads converted to trails	10%

Alternative 2

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

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: Although this alternative would not result in the addition of any miles of unauthorized routes to the NFTS, vehicles would be allowed to use all existing motorized trails because cross-country travel would be allowed. Therefore, it is assumed that wheeled motorized vehicles will continue to use all of the documented unauthorized routes previously identified and continue to create new routes. The use of these routes and the continued proliferation of new routes would result in increasing amounts of direct and indirect effects to goshawks. These effects would be similar to those discussed within Alternative 4 for the short-term, but would be exacerbated over the long-term by the continued proliferation of routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would reduce potential disturbance to goshawks.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 3

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, PACs, and preferred habitat. This would reduce the risk of direct and indirect effects to goshawks from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: This alternative would not result in the addition of any motorized routes to the NFTS, nor would it change the type of use on any current NFTS routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would reduce potential disturbance to goshawks.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 4

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, PACs, and preferred habitat. This would reduce the risk of direct and indirect effects to goshawks from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 4, several analyses were completed (Table 27). Direct and indirect effects of the actions proposed in this alternative would be similar to those discussed in Alternative 1. For further discussion regarding those effects please see discussion above. In the absence of further field review, it is assumed that motorized use along all routes within 400 meters of activity centers would result in some disturbance to nesting goshawks. Therefore, it is assumed that approximately 13% of nest sites would receive some disturbance. Since there is a slight increase from Alternative 1 in the number of routes added to the system or converted to a trail within PACs, near activity centers, and within preferred habitat, there would be a slight increase in the direct and indirect effects goshawks within the project area. Although these effects would impact individuals and some reproducing pairs over the short-term, they would not result in impacts to populations within the project area over the short or long-term.

Actions proposed in this alternative would result in some indirect effects through habitat modification. 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.

Season of Use: Although the exact timing may vary, goshawks may start nesting in February. Therefore, seasonal closures for Zone 2 and Zone 3 (as identified for each route in Appendix I of the STF Travel Management DEIS) would overlap the beginning of the nesting period. Since approximately 96% of the goshawk PACs would be within these Zones, these closures would reduce disturbance to most goshawks during the early nesting period.

Mitigation Measures: The effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 27. Northern Goshawk: Direct and Indirect Effects Indicators - Alternative 4

Alternative 4 - Northern Goshawk - Direct and Indirect Effects Indicators	
Miles of routes added to the NFTS within PACs	1.51
Miles of ML1 roads converted to trails within PACs	2.16
Number of PACs intersected by routes added to the NFTS or ML1 roads converted to trails (Percentage of all PACs in Project Area)	13 (17%)
Miles of routes added to the NFTS within 400 meters of Activity Centers	1.49
Miles of ML1 roads converted to trails within 400 meters of Activity Centers	1.81
Number of Activity Centers occurring within 400 meters of routes added to the NFTS or ML1 roads converted to trails (Percentage of all Activity Centers in Project Area)	10 (13%)
Percentage of PACs (total acres) occurring within a 400 meter “zone of influence” of routes added to the NFTS or ML1 roads converted to trails	13%

Alternative 5

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, PACs, and preferred habitat. This would reduce the risk of direct and indirect effects to goshawks from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 5, several analyses were completed (Table 28). Direct and indirect effects of the actions proposed in this alternative would be similar to those discussed in Alternative 1. For further discussion regarding those effects please see discussion above. In the absence of further field review, it is assumed that motorized use along all routes within 400 meters of activity centers would result in some disturbance to nesting goshawks. Therefore, it is assumed that approximately 1% of nest sites would receive some disturbance. Since there is a significant decrease from Alternative 1 in the number of routes added to the system or converted to a trail within PACs, near activity centers, and within preferred habitat, there would be a significant decrease in the direct and indirect effects goshawks within the project area. This alternative would result in very minor amounts of habitat fragmentation that would not have any measurable effects to goshawks. Although these effects would impact individuals and some reproducing pairs over the short-term, they would not result in impacts to populations within the project area over the short or long-term.

Season of Use: Although the exact timing may vary, goshawks may start nesting in February. Therefore, seasonal closures for Zone 2 and Zone 3 (as identified for each route in Appendix I of the STF Travel Management DEIS) would overlap the beginning of the nesting period. Since approximately 96% of the goshawk PACs would be within these Zones, these closures would reduce disturbance to most goshawks during the early nesting period.

Mitigation Measures: The effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 28. Northern Goshawk: Direct and Indirect Effects Indicators - Alternative 5

Alternative 5 - Northern Goshawk - Direct and Indirect Effects Indicators	
Miles of routes added to the NFTS within PACs	0.19
Miles of ML1 roads converted to trails within PACs	0
Number of PACs intersected by routes added to the NFTS or ML1 roads converted to trails (Percentage of all PACs in Project Area)	2 (3%)
Miles of routes added to the NFTS within 400 meters of Activity Centers	0.03
Miles of ML1 roads converted to trails within 400 meters of Activity Centers	0
Number of Activity Centers occurring within 400 meters of routes added to the NFTS or ML1 roads converted to trails (Percentage of all Activity Centers in Project Area)	1 (1%)
Percentage of PACs (total acres) occurring within a 400 meter "zone of influence" of routes added to the NFTS or ML1 roads converted to trails	1%

Cumulative Effects

In 2001and 2004 the Forest Service amended Sierra Nevada Forest Plans to better address the needs of old forest-associated species (USDA 2001, USDA 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. Fuels reduction treatments and wildfire effects are identified as the predominant effectors of goshawk habitat. Appendix B (STF Travel Management DEIS) provides a list and description of past, present, and reasonably foreseeable projects on the STF and private lands within the forest boundary. Some, but not all, of these activities will contribute to effects upon northern goshawks.

Based on GIS analysis, 3 wildfires have burned through 3 goshawk PACs (4%) affecting approximately 28 acres or less than 1% of those PACs since 2000. Forest vegetation/fuels thinning projects (designed to reduce the risk of additional habitat loss to wildfires) have treated approximately 788 acres or 5% of goshawk PACs between 2000 and 2008. CDF currently lists a total of 2,365 acres of private land within the STF administrative boundary for which timber harvest plans have been submitted. Timber harvest on private lands is generally more intensive and does not typically maintain habitat suitability for spotted owls. These wildfires and fuels treatment projects have resulted in reduction in the amount and quality of spotted owl habitat on the STF.

Vegetation/fuels reduction projects will continue to be the primary activity affecting goshawk habitat on the STF (Appendix B STF Travel Management DEIS). These projects will likely occur

on an estimated 3,500 acres per year, based upon the acreage treated in 2006. Although these treatments will degrade habitat, it is anticipated that over time, the amount of habitat removed in stand replacing wildfires will be reduced as a result of these treatments (USDA 2004).

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, USDA 2004). Given the proportion of goshawk nest sites and habitat potentially affected, and considering the projections for future increases in recreation uses and OHV activity, Alternative 2 may, over time, contribute to cumulative effects upon goshawk populations. Because Alternative 2 does not restrict vehicles 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 4, 1, and 5 would result in progressively lower risk to goshawks due to the amount of motorized routes being added to the system.

Since human disturbance has been recognized as a significant risk fact, non-motorized recreation (hiking, cycling, and equestrian use) may result in additional disturbance to nesting and foraging goshawks. Non-motorized recreation occurs along an additional 394 miles of summer trails. Human disturbance from use of non-motorized routes contributes to the direct and indirect effects of the project alternatives.

Considering the proportion of goshawk habitat influenced by motorized routes and projections for future increases in recreation uses 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 impacts, they are fairly minor in comparison to existing road densities and other potentially significant impacts (fire, fuels/vegetation treatments).

Determinations

Alternative 1

This alternative would result in increased amounts of disturbance and minor habitat fragmentation within the project area, but would be limited over the long-term since cross-country travel would be prohibited. Disturbance resulting from this alternative would likely result in adverse impacts to some pairs and individual goshawks. Since goshawks are widespread throughout the project area, effects would be limited to a small percentage of the activity centers, and cross-country travel would be prohibited, these effects would not likely result in any impacts to goshawk populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the northern goshawk.

Alternative 2

Although this alternative would result in increased amounts of disturbance and habitat fragmentation within the project area, continued route proliferation would ultimately be limited by topography and wilderness areas. Disturbance resulting from this alternative would likely result in adverse impacts to individual goshawks. Increased habitat fragmentation from route proliferation would likely result in impacts to individuals over the short-term and long-term. Goshawks are distributed throughout the project area and throughout the western United States. Therefore, population level impacts would be minor and would not threaten the long-term viability of the species.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the northern goshawk.

Alternative 3
Since this alternative would not result in the addition of any routes to the NFTS, there would not be any direct or indirect effects to goshawks over the short-term. Since cross-country travel would be prohibited, disturbance would be decreased over the long-term and all unauthorized routes within PACs and emphasis habitat would slowly rehabilitate. The rehabilitation of these routes would result in minor improvements to goshawk habitat over the long-term.

Therefore, it is my determination that this alternative would have a "*Beneficial Impact*" on the northern goshawk.

Alternative 4
This alternative would result in increased amounts of disturbance and minor habitat fragmentation within the project area, but would be limited over the long-term since cross-country travel would be prohibited. Disturbance resulting from this alternative would likely result in adverse impacts to some pairs and individual goshawks. Since goshawks are widespread throughout the project area, effects would be limited to a small percentage of the activity centers, and cross-country travel would be prohibited, these effects would not likely result in any impacts to goshawk populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the northern goshawk.

Alternative 5
This alternative would result in increased amounts of disturbance and minor habitat fragmentation within the project area, but would be limited over the long-term since cross-country travel would be prohibited. Disturbance resulting from this alternative would likely result in adverse impacts to some individual goshawks. Since goshawks are widespread throughout the project area, effects would be limited to a small percentage of the activity centers, and cross-country travel would be prohibited, these effects would not likely result in any impacts to goshawk populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the northern goshawk.

Peregrine Falcon
Falco peregrinus

Species and Habitat Account
The peregrine falcon is found throughout the western United States and is a year-round resident of California. Peregrines have relatively strict nesting requirements: vertical cliff habitat with large potholes or ledges that are inaccessible to land predators and are preferentially located near habitat that has a high avian prey population. There are currently two peregrine falcons eyries located on the STF at Donnells Reservoir and Pincrest Peak.

Management Direction
The peregrine falcon was listed as a federally endangered species from 1970 through 1999. On August 25, 1999 the final rule was published to de-list the peregrine falcon and it was then identified by the Regional Forester as a Sensitive Species on the STF (64 FR 46542, USDA 2007a). The Forest Plan Direction contains the following management direction associated with the proposed project for the peregrine falcon:

- Implement a limited operating period (LOP), from February 1 through July 31, on all peregrine falcon territories active within the preceding five years, for at least 0.5 miles from the nest.
    - Restrict motor vehicle activities and new road construction; during this LOP, according to a management plan for the area.
    - Prohibit motor vehicle activity within 200 feet of lake shorelines that are used by peregrine falcons.

Direct & Indirect Effects

General - All Alternatives

The project alternatives could result in direct and indirect effects to the peregrine falcon by:

- Prohibiting cross-country travel off of the NFTS,
- Adding facilities to the NFTS,
- Changing the type of use on NFTS routes,
- Changing the season of use on NFTS routes,
- Implementing mitigation measures.

These actions may have direct and indirect effects on peregrine falcons through: human-caused mortality and changes in behavior.

Human-Caused Mortality:

Allowing cross-country travel or adding routes to the NFTS could improve access to peregrine falcon eyries, thereby; increasing the risk of capture of peregrine falcons to be used for falconry. Although capturing falcons for falconry, is not a direct form of mortality, illegal capture has been documented as a significant cause of population declines (Hickey 1969).

Changes in Behavior:

Allowing cross-country travel or adding routes to the NFTS could improve access to peregrine falcon eyries, thereby; increasing disturbance to the eyrie. The response of peregrine falcons to disturbance is variable, but may result in abandonment of the eyrie (USDI 1982). Based upon incidental observations of peregrine falcon responses to disturbance, a spatial buffer of 0.5 to 1.0 mile has been recommended to avoid breeding disturbance (Ellis 1982, Hayes and Milner 1999).

Alternative 1

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 peregrine falcon eyries and foraging habitat. This would reduce the risk of direct and indirect effects to peregrine falcons from motorized travel over the long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: The direct or indirect effects of these actions would be insignificant and discountable to peregrine falcons for the following reasons:

- This alternative would not add new routes within one mile of any existing eyrie or territory. Therefore, the alternative would not result in an increase in disturbance to eyries.
- This alternative would not propose any new motorized routes within 200 feet of lake shorelines used by peregrine falcons. Therefore, this alternative would not result in increased disturbance in foraging areas.

Season of Use: Peregrine falcon eyries within the project area are located at higher elevations and would be within Zone 3 of the seasonal closures (as identified for each route in Appendix I of the STF Travel Management DEIS). Motorized use would be seasonally restricted in near the eyries and foraging areas for a significant portion of the year; providing further beneficial impacts.

Mitigation Measures: Mitigation measures would not be implemented within one mile of peregrine falcon eyries or near foraging areas. Therefore, there would not be any direct or indirect effects to peregrine falcons from these actions.

Alternative 2
Cross-Country Travel: Cross-country travel would not be prohibited under this alternative. Therefore it is assumed that route proliferation would continue over the short and long-term and the effects would be similar to those discussed below for adding routes to the NFTS.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: Although this alternative would not result in the addition of any miles of unauthorized routes to the NFTS, vehicles would be allowed to use all existing motorized trails because cross-country travel would be allowed. Therefore, it is assumed that wheeled motorized vehicles will continue to use all of the documented unauthorized routes previously identified and continue to create new routes. The use of these routes and the continued proliferation of new routes may result in increasing amounts of disturbance to eyries and foraging areas.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would provide beneficial impacts to peregrine falcons.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 3
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 peregrine falcon eyries and foraging areas. This would reduce the risk of direct and indirect effects to peregrine falcons from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: This alternative would not result in the addition of any motorized routes to the NFTS, nor would it change the type of use on any current NFTS routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would provide beneficial impacts to peregrine falcons.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 4
The direct and indirect effects of this alternative would be the same as those discussed for Alternative 1.

Alternative 5
The direct and indirect effects of this alternative would be the same as those discussed for Alternative 1.

Cumulative Effects

Peregrine falcon numbers have increased substantially across the United States over the past two decades. The following risk factors have been identified for peregrine falcons: 1) collision with stationary structures and objects (particularly transmission lines), 2) illegal shooting or collection, 3) disturbance at eyries, 4) pesticides and contaminants, and 5) degradation of habitat.

Rock climbing near the peregrine falcon eyries likely has the greatest potential threat to nesting success. Alternatives 1, 4, and 5 would not improve access to either of the eyries on the STF, and would not increase disturbance to nesting falcons. Alternative 2 would have the greatest risk to these falcons since it does not limit human access near eyries or foraging areas. Since the majority of suitable nesting habitat is located in areas that are inaccessible to motorized vehicles, the impacts of Alternative 2 would be limited and would not likely have significant impacts to populations within the project area.

Determinations

Alternative 1
Cross-country travel would be prohibited and there would not be any motorized routes added to the NFTS within one mile of eyries or near foraging areas. Prohibiting cross-country travel would prevent disturbance to eyries and near foraging areas over the long-term.

Therefore, it is my determination that this alternative would have "*No Impact*" to the peregrine falcon.

Alternative 2
This alternative would likely result in minor increases in disturbance near foraging areas and eyries within the project area, Increased disturbance may result in impacts to individuals over the long-term. Since peregrine falcon habitat is largely inaccessible, disturbance from motorized access would not likely result in impacts to populations within the project area.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the peregrine falcon.

Alternative 3
Cross-country travel would be prohibited and there would not be any motorized routes added to the NFTS in this alternative. Prohibiting cross-country travel would prevent disturbance to eyries and near foraging areas over the long-term.

Therefore, it is my determination that this alternative would have a "*Beneficial Impact*" on the peregrine falcon.

Alternative 4
Cross-country travel would be prohibited and there would not be any motorized routes added to the NFTS within one mile of eyries or near foraging areas. Prohibiting cross-country travel would prevent disturbance to eyries and near foraging areas over the long-term.

Therefore, it is my determination that this alternative would have "*No Impact*" to the peregrine falcon.

Alternative 5
Cross-country travel would be prohibited and there would not be any motorized routes added to the NFTS within one mile of eyries or near foraging areas. Prohibiting cross-country travel would prevent disturbance to eyries and near foraging areas over the long-term.

Therefore, it is my determination that this alternative would have "*No Impact*" to the peregrine falcon.

Willow Flycatcher
Epidonax traillii

Species and Habitat Account

The willow flycatcher is a neotropical migrant that historically occupied much of California. Preferred habitat for the willow flycatcher in the Sierra Nevada is mainly mountain meadows with clumps of willows and/or alders at 2,000 to 8,000 feet elevation. Suitable meadows are generally 20 acres or greater in size, although they are known to breed in meadows less than one acre in size. Serena (1982) found a significant association between meadow size and willow flycatcher presence and Fowler et al. (1991) determined that preferred habitat generally occurred in meadows greater than 10 acres in size. There are seven willow flycatcher sites currently designated on the STF: one conditional, one historic, and five occupied. For this analysis, Emphasis habitat is defined as meadows within 5 miles of occupied willow flycatcher sites that are larger than 15 acres that have standing water on June 1 and a deciduous shrub component.

Management Direction

The willow flycatcher was identified by the Regional Forester as a Sensitive Species on the STF (USDA 2007a). The Forest Plan Direction does not provide any specific management direction related to this project for the willow flycatcher.

Direct & Indirect Effects

General - All Alternatives

The project alternatives could result in direct and indirect effects to the willow flycatcher by:

- Prohibiting cross-country travel off of the NFTS,
- Adding facilities to the NFTS,
- Changing the type of use on NFTS routes,
- Changing the season of use on NFTS routes,
- Implementing mitigation measures.

These actions may have direct and indirect effects on willow flycatchers through: human-caused mortality and habitat modification.

Human-Caused Mortality:

Allowing cross-country travel or adding routes to the NFTS could result in direct effects to willow flycatcher nest sites. Increasing the amount of motorized vehicle use near nest sites could result in nests being over-turned or branches being broke that support nests (Kus et al. 1999).

Habitat Modification

Allowing cross-country travel and adding routes to the NFTS could result in indirect effects to willow flycatchers through habitat modification. Factors responsible for the decline of willow flycatcher populations in the Sierra Nevada are primarily thought to be the result of habitat change, particularly the alteration of meadow hydrology, specifically caused by roads (Green et al. 2003). Roads and trails within meadows intercept surface and subsurface hydrologic flow, resulting in meadow drying, a reduction of standing water, and changes to flora and fauna communities (Green et al. 2003, Kattlelmann 1996). As the meadow becomes drier and there are fewer willows, suitable nesting sites will be lost. The reduction in floodplain connectivity and standing water will result in a reduction in aquatic insects and available forage for willow flycatchers.

Alternative 1

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 willow flycatcher habitat. This would reduce the risk of direct and indirect effects to willow flycatchers from motorized travel over the long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: The direct or indirect effects of these actions would be insignificant and discountable willow flycatchers for the following reasons:

- This alternative would not add any new routes within occupied willow flycatcher habitat. Therefore, direct effects to nest sites are not expected to occur.

- A GIS analysis was conducted and this alternative would result in the addition of only 49 meters of trail (18EV283) to the NFTS within emphasis habitat. Although approximately 49 meters of trail 18EV283 occurred within the emphasis habitat delineated in a GIS analysis, a field survey was conducted and it was determined that this route actually parallels the meadow and stays within the conifer forest surrounding the meadow. Therefore, the addition of this route to the NFTS would not result in indirect effects to the willow flycatcher through habitat modification.

Season of Use: Willow flycatcher habitat is located throughout mid to upper elevations within the project area and falls within Zone 2 and Zone 3 of the seasonal closures (as identified for each route in Appendix I of the STF Travel Management DEIS). Motorized use would be seasonally restricted near willow flycatcher habitat for a significant portion of the year; providing further beneficial impacts.

Mitigation Measures: Mitigation measures would not be implemented within willow flycatcher habitat. Therefore, there would not be any direct or indirect effects to willow flycatchers from these actions.

Alternative 2
Cross-Country Travel: Cross-country travel would not be prohibited under this alternative. Therefore it is assumed that route proliferation would continue over the short and long-term and the effects would be similar to those discussed below for adding routes to the NFTS.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: Although this alternative would not result in the addition of any miles of unauthorized routes to the NFTS, vehicles would be allowed to use all existing motorized trails because cross-country travel would be allowed. Therefore, it is assumed that wheeled motorized vehicles will continue to use all of the documented unauthorized routes previously identified and continue to create new routes. The use of these routes and the continued proliferation of new routes may result in increasing amounts of habitat modification/fragmentation.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would provide beneficial impacts to willow flycatchers.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 3
Cross-Country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes in and near willow flycatcher habitat. This would reduce the risk of direct and indirect effects to willow flycatchers from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: This alternative would not result in the addition of any motorized routes to the NFTS, nor would it change the type of use on any current NFTS routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would provide beneficial impacts to willow flycatchers.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 4

The direct and indirect effects of this alternative would be the same as those discussed for Alternative 1.

Alternative 5
The direct and indirect effects of this alternative would be the same as those discussed for Alternative 1.

Cumulative Effects

Appendix B (STF Travel Management DEIS) provides a list and description of past, present, and reasonably foreseeable projects on the STF and on private lands within the forest boundary. Some, but not all of these activities will likely contribute to effects upon willow flycatchers. The Forest Service has completed a Conservation Assessment of the Willow Flycatcher in the Sierra Nevada (Green et al. 2003), which identified meadow drying, loss of nesting and foraging substrates (riparian shrubs), increased predator access to meadow interiors, and potentially cowbird parasitism as among the key factors likely responsible for the decline of the willow flycatcher. Livestock management, recreation, water developments and roads are described as causative factors.

Historic livestock grazing has severely impacted many meadows and is considered to be a primary factor that has influenced the suitability of willow flycatcher habitat, and meadow habitat for birds in general (Graber 1996, Green et al. 2003, Menke et al. 1996). Livestock grazing on montane meadows decreases the height and density of herbaceous growth. Many of the landbird species utilizing these meadows feed upon insects that decline in response to removal of this herbaceous growth (Graber 1996). The willow flycatcher conservation assessment finds that there is strong evidence that densities of birds sensitive to the effects of grazing (such as the willow flycatcher) increase more on ungrazed pastures than on grazed pastures (Stanley and Knopf 2002). For numerous reasons, poorly managed grazing in riparian areas can reduce nesting densities of many bird species, particularly of habitat specialists such as Willow Flycatcher, Lincoln's Sparrow and White-crowned Sparrow (RHJV 2004).

All occupied willow flycatcher habitat within the project area is located within active livestock grazing allotments. The condition of these meadows varies, but the condition of this meadow habitat is expected to improve as the process of completing new Allotment Management Plans is completed. The plans are designed to alter livestock use to meet stricter LRMP Standards and Guidelines for meadow protection.

Factors responsible for the decline of willow flycatcher populations in the Sierra Nevada are thought to be largely an agent or result of habitat change, particularly the alteration of meadow hydrology (Green et al. 2003). Alternatives 1, 4, and 5 would not increase disturbance within occupied willow flycatcher habitat and would not result in the addition of any routes that would result in habitat modification/degradation. Therefore these alternatives would not contribute to cumulative effects to this species. Alternative 3 would prohibit cross-country travel and would not add any routes to the NFTS; therefore, this alternative would decrease the risk of disturbance and habitat modification over the long-term. Alternative 2 would have the greatest risk to willow flycatchers over the long-term since it would not limit motorized access within meadows. Although cross-country travel would be permitted; legal motorized access would not result in resource damage. Motorized vehicles would not be able to directly access wet meadows that are often associated with willow flycatcher habitat without causing resource damage; thereby preventing significant habitat modification. Although disturbance may increase around the occupied and emphasis habitat, it would not likely result in significant impacts to populations within the project area.

Determinations

Alternative 1

Cross-country travel would be prohibited and the direct and indirect effects of adding facilities would be insignificant and discountable. Prohibiting cross-country travel would prevent habitat modification/fragmentation; providing beneficial effects over the long-term.

Therefore, it is my determination that this alternative would have "*No Impact*" to the willow flycatcher.

Alternative 2
This alternative would likely result in increased amounts of disturbance and habitat fragmentation within the project area, Increased disturbance and habitat fragmentation may result in impacts to individuals over the long-term, but recreation has not been identified as a significant threat to willow flycatcher populations.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the willow flycatcher.

Alternative 3
Cross-country travel would be prohibited and there would not be any motorized routes added to the NFTS in this alternative. Prohibiting cross-country travel would prevent modification/fragmentation of willow flycatcher habitat over the long-term.

Therefore, it is my determination that this alternative would have a "*Beneficial Impact*" on the willow flycatcher.

Alternative 4
Cross-country travel would be prohibited and the direct and indirect effects of adding facilities would be insignificant and discountable. Prohibiting cross-country travel would prevent habitat modification/fragmentation; providing beneficial effects over the long-term.

Therefore, it is my determination that this alternative would have "*No Impact*" to the willow flycatcher.

Alternative 5
Cross-country travel would be prohibited and the direct and indirect effects of adding facilities would be insignificant and discountable. Prohibiting cross-country travel would prevent habitat modification/fragmentation; providing beneficial effects over the long-term.

Therefore, it is my determination that this alternative would have "*No Impact*" to the willow flycatcher.

Aquatic Wildlife

Effects Common to all Aquatic Wildlife

Due to their limited distribution on the landscape and life history requirements, most species of aquatic wildlife are similarly affected by motorized travel. Although Gaines et al. (2003) described the effects of recreation routes on "riparian species", the effects to aquatic species are very similar and can be categorized in much of the same way. Therefore, the effects of motorized travel management on aquatic species may be categorized by human-caused mortality, changes in behavior, and habitat modification. Generally, site-specific studies on the species interaction with road and trail-associated factors is lacking in the literature. Where site-specific information or literature on road and trail associated factors to aquatic species is unavailable, general information on potential impacts is presented.

Human-Caused Mortality: Allowing cross-country travel or adding routes to the NFTS may result in human-caused mortality to aquatic species in a variety of ways including: collisions and

introduction of non-native species, parasites, or disease vectors. Collisions with vehicles have not only been documented in numerous different herpetofaunal species, they may even be particularly vulnerable to it (Trombulak and Frissell 2000). Mass mortalities of other species of frogs have been documented during dispersal where roads intersect natal/breeding habitat and non-breeding foraging habitat (Hine et al. 1981, Fahrig et al. 1995). Mortality from vehicles can reduce population size and reduce movement between resources and conspecific populations (Carr and Fahrig 2001).Stream crossings are areas of particular concern for collisions. Although some stream crossings have culverts or bridges, fords or low-water crossings are very typical along trails. Locations of fords vary widely, but often occur along a relatively low gradient stretch of stream. When a ford is created in these areas, it often creates a small pool where different life history stages (fingerling fish or tadpoles) of some species may congregate. Increased densities of these species may result in higher rates of collisions. Although some species may be more prone to crushing at crossings, numerous herpetofaunal species migrate from aquatic to terrestrial environments to complete their life histories. These species are even more vulnerable to motorized travel management, because routes may parallel water bodies. Since herpetofaunal species tend to be slow-moving and may migrate across a motorized route that is near a water body, they may have a relatively higher risk of being crushed by vehicles.

Introduction of toxins, non-native organisms, parasites, and disease vectors are the final ways which motorized travel management may result in human-caused mortality. When vehicles travel along a route near a stream or cross a stream at a ford, small amounts of toxins may be introduced to the environment. Although there is a low risk that individuals will be exposed to lethal levels of any of these toxins, small exposures may elicit immune responses within individuals. McCallum and Trauth (2007) found that male northern cricket frogs that elicited immune responses had reduced fertility rates. Therefore, introduction of toxins at low levels may result in reduced reproductive fitness of some aquatic species.

The movement and introduction of non-native organisms, parasites, and disease vectors between water bodies has been recognized as a significant threat to numerous different aquatic species. When traveling roads or trails throughout the course of a day, a vehicle may cross numerous streams. When a vehicle crosses a stream through a low-water crossing or a ford it may capture soil/debris in the tread of the tires or on the body of the vehicle. Non-native organisms, parasites, and disease vectors may be captured in the soil/debris on the vehicle. When crossing subsequent streams, soil/debris may then be deposited potentially spreading non-native organisms, parasites, and disease vectors between water bodies. The risk of adverse effects to individuals and populations is highly variable among species and will be discussed further below.

Changes in Behavior: Although it is not well documented in the literature, it is reasonable to assume that aquatic species may be affected by motorized vehicles through changes in behavior. Travel management may result in increased access of vehicles and human visitors to aquatic species habitat. As with individuals of terrestrial species, individuals of aquatic species are likely to exhibit a predator avoidance response when they become disturbed by humans. Direct effects of disturbance to an individual's fitness are commonly measured through increases in stress hormone levels. Significant increases in stress hormone levels have been found to reduce reproductive success of individuals of some species.

Indirect affects of disturbance are commonly displayed through changes in an individual's time and energy budget. As a vehicle or human approaches an individual, the most obvious and common disturbance response is for that individual to avoid the threat and seek cover. After an individual exhibits the disturbance response, a period of time will elapse until that individual resumes pre-disturbance behavior. Since this change in an individual's time budget may result in less time feeding or resting, the disturbance may result in changes to the individual's energy budget. If an individual is repeatedly disturbed in an area, they may avoid the area, essentially being displaced from the habitat. Significant changes to an individual's energy budget or displacement from its habitat may result in impacts to the individual's fitness. Rodriguez-Prieto and Fernandez-Juricic (2005) found that increases in disturbance from human-visitation resulted

in significant reductions in the use of stream banks by Iberian frogs. They further concluded that disturbance from recreational activities negatively affected Iberian frogs through spatial and temporal losses in resources.

Habitat Modification: Motorized travel management may result in numerous different impacts to aquatic species habitat quality and quantity. Since many of these species are amphibians, they are acutely prone to changes in aquatic and adjacent terrestrial habitats. Alterations to terrestrial habitat may include, but are not limited to: direct reductions in cover (vegetative and underground), introductions of non-native plant species, and impacts to meadow hydrology. Alterations to aquatic habitat may include, but are not limited to: reductions in shade, increased water temperatures, increased sedimentation, altered hydrology and geomorphology.

The transfer of sediment to streams and other water bodies at road crossings is a consequence of roads and trails (Richardson et al. 1975). The surfaces of unpaved roads can route fine sediments to streams, lakes, and wetlands, increasing turbidity of the water (Reid and Dunne 1984). Various studies have demonstrated that sediment delivery to stream channels in a forested environment is correlated to road surface type, physical characteristics of the adjacent areas (e.g., litter depth, coarse wood), soils (erodibility), the steepness of slope below the road, and vehicle usage (Chin and others 2004, Clinton and Vose 2003). The knowledge of the impact of increased sediment load on amphibians is limited (Gillespie 2002). However, the negative impacts of increased sediments on aquatic species, including fish, macroinvertebrates, and periphyton, are well known (Power 1990, Newcombe and MacDonald 1991, Waters 1995). High concentrations of suspended sediment may directly kill aquatic organisms and impair aquatic productivity (Newcombe and Jensen 1996). Egg survival may be impacted by roads and trails through increases in fine sediments. Increased sedimentation may also reduce availability of important food resources for tadpoles such as algae (Power 1990). Fine sediment deposits also tend to fill pools and smooth gravel beds, degrading habitats (Forman and Alexander 1998) and possibly the availability of oviposition sites or larval refugia (Welsh and Ollivier 1998). In addition, the consequences of past sedimentation are long term and cumulative, and cannot be mitigated effectively (Hagans et al. 1986).

The effects are heightened if the sediments contain toxic materials (Maxell and Hokit 1999). At least five different general classes of chemicals are transferred into the environment from maintenance and use of roads: heavy metals, salt, organic molecules, ozone, and nutrients (Trombulak and Frissell 2000). The changes to water chemistry by road runoff may affect living organisms in several ways. For example, chemicals found in road de-icers may kill (Doughtery and Smith 2006) or displace frog life stages, or they may be accumulated in plants as toxins which, in turn, can depress larval amphibian growth.

Roads can also influence both peak flows (floods) and debris flows (rapid movements of soil, sediment, and large wood stream channels) two processes which have major influences on riparian vegetation (Jones et al. 2000) as well as aquatic and riparian patch dynamics critical to stream ecosystems (Pringle et al. 1988). Numerous frog species breed in streams which can be adversely affected by fluctuations in the frequency or magnitude of peak flows, thereby, adversely affecting recruitment.

For amphibians, the species and habitat accounts below were summarized from Lannoo (2005). Additional references are cited to address specific elements of the species and habitat accounts for all species below.

Threatened and Endangered Species

Lahontan Cutthroat Trout

Oncorhynchus clarki henshawi

Species and Habitat Account

The Lahontan cutthroat trout (LCT) is known as the largest subspecies of cutthroat and widely popular among anglers. It was historically located throughout the Lahontan Basin in Nevada, Oregon, and California. Currently, LCT occupy only a small portion of their historical range. The STF is located on the east side of the Sierra Nevada Mountains, therefore, lying outside of the Lahontan Basin and outside of the native range of the LCT. Although they are not native, LCT currently occupy four 7th field watersheds in the project area: Pacific Valley, Highland Lakes, Headwaters Highland Creek, and Disaster Creek.

Management Direction

The Lahontan cutthroat trout (LCT) was listed by the USFWS as an endangered species in 1970 (35 FR 13520). The listing was reclassified to threatened status in 1975 to facilitate recovery and management efforts and authorize regulated angling (40 FR 29864). Critical Habitat has not been designated for the LCT (USDI 1995). Project Design Criteria (PDC) for route designation were determined through a programmatic consultation with the USFWS to achieve "No Effect" or "May Affect Not Likely to Adversely Affect" determinations. PDC for the LCT are:

- Routes and areas do not cross any stream within the occupied range of LCT.
- Route and areas are not located on active landslides and do not re-route surface water onto active landslides within watersheds that provide habitat for LCT.
- Within watersheds that provide habitat for LCT, routes or areas do not have the potential to capture surface run-off and then deliver sediment into a stream.
- Areas are located outside of Riparian Conservation Areas (RCAs) that are within watersheds that provide habitat for LCT.
- Within watersheds that provide habitat for LCT, routes avoid RCAs.

Direct & Indirect Effects

General – All Alternatives

The project alternatives could result in direct and indirect effects to the LCT by:

- Prohibiting cross-country travel off of the NFTS,
- Adding facilities to the NFTS,
- Changing the type of use on NFTS routes,
- Changing the season of use on NFTS routes,
- Implementing mitigation measures.

These actions may have direct and indirect effects on LCT through: human-caused mortality and habitat modification.

Allowing cross-country travel or adding motorized routes to the NFTS may result in direct and indirect effects on trout in a variety of ways, including: crushing eggs/fry/alevins, disturbance at stream crossings, impaired water quality and spawning habitat, and improved angling access.

Alternative 1

Cross-Country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes within watersheds occupied by LCT. This would reduce the risk of direct and indirect effects to LCT from motorized travel over the long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: The direct or indirect effects of these actions would be insignificant and discountable LCT for the following reasons:

- This alternative would not improve angler access to streams occupied by LCT.
- This alternative would not designate any routes that would result in any crossings on streams that are occupied by LCT.

- This alternative would not designate any routes that would contribute sediment to drainages upstream of or currently occupied by LCT.
- The action alternatives would not designate any routes or areas within RCA's associated with LCT.

Season of Use: Watersheds occupied by LCT are located at higher elevations within the project area and fall within Zone 3 of the seasonal closures (as identified for each route in Appendix I of the STF Travel Management DEIS). Wheeled motorized use would be seasonally restricted within these for a significant portion of the year; providing further beneficial impacts.

Mitigation Measures: Mitigation measures would not be implemented within watersheds occupied by LCT. Therefore, there would not be any direct or indirect effects to LCT from these actions.

Alternative 2
Cross-Country Travel: Cross-country travel would not be prohibited under this alternative. Therefore it is assumed that route proliferation would continue over the short and long-term and the effects would be similar to those discussed below for adding routes to the NFTS.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: Although this alternative would not result in the addition of any miles of unauthorized routes to the NFTS, vehicles would be allowed to use all existing motorized trails because cross-country travel would be allowed. Therefore, it is assumed that wheeled motorized vehicles will continue to use all of the documented unauthorized routes previously identified and continue to create new routes. The use of these routes and the continued proliferation of new routes may result in increasing amounts of disturbance and habitat modification/fragmentation.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would provide beneficial impacts to LCT.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 3
Cross-Country Travel: Cross-country travel would be prohibited in this alternative. Prohibiting cross-country travel would limit the proliferation of illegally created routes within watersheds occupied by LCT. This would reduce the risk of direct and indirect effects to LCT from wheeled motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: This alternative would not result in the addition of any motorized routes to the NFTS, nor would it change the type of use on any current NFTS routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would provide beneficial impacts to LCT.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 4
The direct and indirect effects of this alternative would be the same as those discussed for Alternative 1.

Alternative 5

The direct and indirect effects of this alternative would be the same as those discussed for Alternative 1.

Cumulative Effects

Appendix B (STF Travel Management DEIS) provides a list and description of past, present, and reasonably foreseeable projects on the STF and private lands within the STF boundary. Some, but not all, of these activities will contribute to effects upon LCT. The USDI (1995) identified the following principle threats to the LCT: 1) habitat alternation from livestock grazing; 2) urban and mining development; 3) water diversions; 4) water quality; 5) hybridization with non-native fish species; and 6) competition with introduced fish species. Within the analysis area, livestock grazing, competition with introduced fish species and vegetation management activities have impacted or have the potential to result in impacts to individuals or modification of habitat.

Livestock grazing has the potential to affect individuals and habitat through numerous ways. When cattle approach and/or enter streams to drink they may directly affect LCT by disturbing juveniles and adults. When disturbed, normal behavior may be interrupted potentially resulting in increased rates of predation. Indirect effects that may occur to LCT from grazing include: reducing near-stream vegetation and de-stabilizing stream banks, which can lead to increased stream temperature, fine sediment input, and filling of pools. All occupied streams on the STF fall within active grazing allotments. Historically, livestock had unrestricted access to public land. Recently, land management agencies have recognized the widespread impacts of unrestricted grazing and have began implementing monitoring and guidelines to ensure sustainable practices. The Sierra Nevada Forest Plan Amendment (2004) provides management direction and standards and guidelines for livestock utilization and streambank disturbance. Implementation and monitoring of these standards and guidelines will likely reduce the potential habitat impacts of livestock grazing. In summary, livestock grazing has historically and could cumulatively affect LCT habitat in the future and should be appropriately monitored to reduce the potential impacts.

Ongoing and planned vegetation and fuels management projects within the project area should not add cumulative impacts to effects due to the location of planned projects in respect to occupied LCT habitat and the implementation of Best Management Practices and Riparian Conservation Objectives for Riparian Conservation Areas.

Alternatives 1, 4, and 5 would not result in any direct or indirect effects to the LCT. Therefore these alternatives would not contribute to cumulative effects to this species. Alternative 3 would prohibit cross-country travel and would not add any routes to the NFTS; therefore, this alternative would decrease the risk of disturbance and habitat modification over the long-term. Alternative 2 would have the greatest risk to LCT over the long-term since it would not prohibit motorized access near occupied LCT habitat.

Determinations

Alternative 1

Cross-country travel would be prohibited and the direct and indirect effects of adding facilities would be insignificant and discountable. Prohibiting cross-country travel would prevent disturbance and habitat modification/fragmentation; providing beneficial effects over the long-term.

Therefore, it is my determination that this alternative would have "*No Effect*" on the LCT.

Alternative 2

This alternative would likely result in increased amounts of disturbance and habitat modification within the project area, Increased disturbance and habitat fragmentation may result in impacts to individuals over the long-term, but a large portion of occupied an and suitable LCT habitat within the project area is located within roadless and wilderness areas and would not be adversely impacted by route proliferation.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the Lahontan cutthroat trout.

Alternative 3
Cross-country travel would be prohibited and there would not be any motorized routes added to the NFTS in this alternative. Prohibiting cross-country travel would prevent modification/fragmentation of willow flycatcher habitat over the long-term.

Therefore, it is my determination that this alternative would have "*Fully Beneficial Affects*" on the LCT.

Alternative 4
Cross-country travel would be prohibited and the direct and indirect effects of adding facilities would be insignificant and discountable. Prohibiting cross-country travel would prevent disturbance and habitat modification/fragmentation; providing beneficial effects over the long-term.

Therefore, it is my determination that this alternative would have "*No Effect"* on the LCT.

Alternative 5
Cross-country travel would be prohibited and the direct and indirect effects of adding facilities would be insignificant and discountable. Prohibiting cross-country travel would prevent disturbance and habitat modification/fragmentation; providing beneficial effects over the long-term.

Therefore, it is my determination that this alternative would have "*No Effect"* on the LCT.

California Red-legged Frog
Rana aurora draytonii

Species and Habitat Account

The California red-legged frog (CRLF) historically occurred from the California coast, throughout the Central Valley and into the Sierra Nevada foothills. Currently, the CRLF occupies approximately 70% of their historic range and are primarily located in streams and wetlands in coastal drainages (71 FR 19244). There are no recent (<40 years) occurrences of the STF (USDI 2002); however, historic records exist in CNDDB at Jordan Pond (1967) and Woods Creek (1950). Herpetofauna surveys have occurred extensively throughout the STF, but surveys have used a generalized visual encounter method (Fellers and Freel 1995) and have not been conducted according to the most recent CRLF protocol (USDI 2005) nor have they covered all aquatic habitat within the project area in. Between 1995 and 2005, USFWS protocol-level surveys were conducted for CRLF within the project area in the following areas: Bull Creek (in Anderson Valley), Rush Creek, Jordan Pond, Bean Creek, Smith Creek. Despite significant survey efforts, there have been no recent observations of the CRLF within the project area. Although there have not been any observations of the CRLF in the project area, all suitable habitat has not been surveyed within the last two years to the most recent protocol (USDI 2005). Therefore, this analysis assumes that suitable habitat is occupied.

The CRLF is a highly aquatic species typically found in cold water ponds and stream pools with depths exceeding 0.7 meters and with overhanging vegetation such as willows, as well as emergent and submergent vegetation (Hayes and Jennings 1988). Suitable habitat on the forest is defined as areas on the landscape that meet the definition of PCE as defined in Federal Register and consist of aquatic breeding habitat, non-breeding aquatic habitat, upland habitat, and dispersal habitat (71 FR 19244).

Management Direction

On May 23, 1996, the California red-legged frog was listed as a threatened species (61 FR 25813). On April 13, 2006 critical habitat was designated, but does not exist on the STF (71 FR 19244). To assist with the Travel Management Planning process, Region 5 USFS entered into programmatic consultation with the United States Fish and Wildlife Service (USFWS) for motorized vehicle route designation. On December 27, 2006, the USFWS issued a Letter of Concurrence for 14 National Forests in California, including the STF. The Letter of Concurrence approved the Project Design Criteria (PDC) as outlined in the document entitled "Route Designation: Project Design Criteria for 'No Effect' or 'May Affect Not Likely to Adversely Affect' determination for TE Species – October 2006 version 1". Therefore, without further consultation with USFWS all actions proposed within a Travel Management Plan Alternatives (analyzed in detail) must comply with the PDC to reach a determination of "No Effect" or "May Affect Not Likely to Adversely Affect" for TE species. PDC for the California red-legged frog are:

- Routes or areas do not have the potential to capture surface run-off and then deliver sediment into a stream associated with the California red-legged frog.
- In suitable California red-legged frog habitat, routes avoid Riparian Reserve (RR) and Riparian Conservation Areas (RCAs) except where necessary to cross streams. Crossing approaches get the riders in and out of the stream channel and riparian area in the shortest distance possible while meeting the gradient and approach length standards.
- Routes or areas do not cross any stream or waterbody within 500 feet of known occupied sites of California red-legged frog; and route or area is not within a distance of 500 feet from wetland (i.e. springs, wet meadows, ponds, marshes).
- In habitat occupied by California red-legged frog, routes or areas do not have the potential to capture or divert stream flow. The approaches to stream crossings are down-sloped toward the stream on both sides.
- Areas are located outside of RR and RCAs, meadows, and wetlands, within California red-legged frog habitat.
- No route or areas are within Critical Aquatic Refuges for California red-legged frog.

Although the PDC specifically address "unauthorized routes and areas", the action alternatives are not currently proposing any "unauthorized areas". Therefore, this analysis specifically addressed "unauthorized routes" that were identified in the site-specific analysis.

The Forest Plan Direction contains the following management direction associated with the proposed project for the California red-legged frog:

- Within 300 feet of streams or ponds that have potential suitable habitat:
    - Construct new roads or trails or use off-road routes for motorized vehicles only after conducting amphibian surveys to the most recent protocol for the frog.
    - Allow stream crossings only where the route, through the water, and the adjacent streamside areas are naturally resistant to tires or are hardened with rock or other materials.

Direct & Indirect Effects

General – All Alternatives

The project alternatives could result in direct and indirect effects to the California red-legged frog by:

- Prohibiting cross-country travel off of the NFTS,
- Adding facilities to the NFTS,
- Changing the type of use on NFTS routes,
- Changing the season of use on NFTS routes,
- Implementing mitigation measures.

These actions may have direct and indirect effects on California red-legged frogs through: human-caused mortality, changes in behavior, and habitat modification (see Effects Common to all Aquatic Wildlife). Furthermore, these frogs may be more or less prone to motorized travel management because they utilize upland habitats, frequently considerable distances from aquatic features. Bulger et al. (2003) and Fellers and Kleeman (2007) reported terrestrial movements up to 1.7 miles before and after the breeding period as adults dispersed into other non-breeding aquatic habitats. Fellers and Kleeman (2007) also reported that a large portion of the population (35%) can move during single rainfall events and a majority of all frogs in a population migrate during the breeding season. The CRLF can also move in excess of 150 yards from aquatic habitat to seek cover in upland habitats and remain for up to three weeks (Bobzien and DiDonato 2007).

Indicators
The following indicators were chosen to provide a relative measure of the direct and indirect effects to the CRLF and to determine if the project alternatives would comply with USFWS PDC. Thresholds for some of these indicators were established by the USFWS PDC (see above).

- Number of routes that have the potential to capture surface run-off and then deliver sediment into a stream associated with the California red-legged frog.
- Number of routes that do not avoid Riparian Reserve (RR) and Riparian Conservation Areas (RCAs) except where necessary to cross streams.
- Number of stream crossings on unauthorized routes within suitable habitat.
- Miles of routes added to the NFTS within 300 feet of suitable habitat.
- Miles of ML1 roads converted to trails within 300 feet of suitable habitat.
- Miles of routes added to the NFTS within dispersal habitat.
- Miles of ML1 roads converted to trails within dispersal habitat.

Alternative 1
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 suitable California red-legged frog habitat. This would reduce the risk of direct and indirect effects to these frogs from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 1, several analyses were completed (Table 29). This alternative would result in the addition of several routes with 20 stream crossings within suitable CRLF habitat. These stream crossings would likely result in direct and indirect effects to some individuals of all CRLF life history stages. The addition of routes and conversion of roads to trails within 300 feet of suitable aquatic habitat may result in direct effects to some juvenile and adult frogs and indirect effects to all life history stages. The addition of routes and conversion of roads to trails within dispersal areas may also result in direct effects to some adults dispersing between breeding sites.

Season of Use: The CRLF primarily inhabits lower elevations throughout its range and are not known to overwinter or enter into torpor. Suitable habitat within the project area is located within Zone 1 and Zone 2 of the seasonal closures (as identified for each route in Appendix I of the STF Travel Management DEIS). Since Zone 1 is open to year-round use, there would not be any beneficial impacts to the CRLF or it's habitat within this Zone. Since breeding typically occurs in late winter and early spring, restrictions on the season of use within Zone 2 would likely reduce direct effects to breeding adults and those that may be migrating between breeding sites. Furthermore, the closure of routes during the wet weather season reduces soil perturbation and subsequent sedimentation routing into streams associated with all life history stages of the CRLF.

Mitigation Measures: Types of mitigation measures proposed on routes associated with suitable CRLF habitat include: barriers, tread hardening, drain dips, and hardened stream crossings. The installation of a hardened stream crossing would likely result in a short-term increase in

sedimentation which may impact some individuals. The installation of all mitigation measures may result in short-term disturbance to some individual frogs, but will limit trail widening, reduce soil perturbation, and reduce sedimentation, providing beneficial effects over the long-term.

Table 29. California Red-legged Frog: Direct and Indirect Effects Indicators - Alternative 1

Alternative 1 - California Red-legged Frog - Direct and Indirect Effects Indicators	
Number of routes which may capture surface run-off and then deliver sediment into a stream associated with the California red-legged frog	7
Number of routes that do not avoid Riparian Reserve (RR) and Riparian Conservation Areas (RCAs) except where necessary to cross streams	13
Number of stream crossings on proposed unauthorized routes within suitable habitat	20
Miles of routes added to the NFTS within 300 feet of suitable aquatic habitat	4.45
Miles of ML1 roads converted to trails within 300 feet of suitable aquatic habitat	0.83
Miles of routes added to the NFTS within dispersal habitat	1.65
Miles of ML1 roads converted to trails within dispersal habitat	1.06

Alternative 2

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

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: Although this alternative would not result in the addition of any miles of unauthorized routes to the NFTS, vehicles would be allowed to use all existing motorized trails because cross-country travel would be allowed. Therefore, it is assumed that wheeled motorized vehicles will continue to use all of the documented unauthorized routes previously identified and continue to create new routes. The use of these routes and the continued proliferation of new routes would result in increasing amounts of direct and indirect effects to these frogs. These effects would be similar to those discussed within Alternative 4 for the short-term, but would be exacerbated over the long-term by the continued proliferation of routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would reduce potential disturbance to individual frogs.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 3

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 occupied and suitable CRLF habitat. This would reduce the risk of direct and indirect effects to these frogs from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: This alternative would not result in the addition of any motorized routes to the NFTS, nor would it change the type of use on any current NFTS routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would reduce potential direct and indirect effects to the CRLF.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 4
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 suitable California red-legged frog habitat. This would reduce the risk of direct and indirect effects to these frogs from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 4, several analyses were completed (Table 30). Direct and indirect effects of the actions proposed in this alternative would be similar to those discussed in Alternative 1. Since there is a slight increase from Alternative 1 in the number of routes added to the system or converted to a trail within 300 feet of suitable aquatic habitat, there would be a slight increase in the direct and indirect effects to these frogs within the project area.

Season of Use: The CRLF primarily inhabits lower elevations throughout its range and are not known to overwinter or enter into torpor. Suitable habitat within the project area is located within Zone 1 and Zone 2 of the seasonal closures (as identified for each route in Appendix I of the STF Travel Management DEIS). Since Zone 1 is open to year-round use, there would not be any beneficial impacts to the CRLF or it's habitat within this Zone. Since breeding typically occurs in late winter and early spring, restrictions on the season of use within Zone 2 would likely reduce direct effects to breeding adults and those that may be migrating between breeding sites. Furthermore, the closure of routes during the wet weather season reduces soil perturbation and subsequent sedimentation routing into streams associated with all life history stages of the CRLF.

Mitigation Measures: The types and effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 30. California Red-legged Frog: Direct and Indirect Effects Indicators - Alternative 4

Alternative 4 - California Red-legged Frog - Direct and Indirect Effects Indicators	
Number of routes which may capture surface run-off and then deliver sediment into a stream associated with the California red-legged frog	7
Number of routes that do not avoid Riparian Reserve (RR) and Riparian Conservation Areas (RCAs) except where necessary to cross streams	13
Number of stream crossings on proposed unauthorized routes within suitable habitat	20
Miles of routes added to the NFTS within 300 feet of suitable aquatic habitat	4.47
Miles of ML1 roads converted to trails within 300 feet of suitable aquatic habitat	2.99
Miles of routes added to the NFTS within dispersal habitat	1.65
Miles of ML1 roads converted to trails within dispersal habitat	1.32

Alternative 5
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 suitable California

red-legged frog habitat. This would reduce the risk of direct and indirect effects to these frogs from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 5, several analyses were completed (Table 31). Routes added within this alternative would not likely result in disturbance or crushing of any individuals or contribute sediment to steams associated with the CRLF. Therefore, this alternative would not result in the addition of any routes to the NFTS that would have direct or indirect effects to the CRLF.

Season of Use: The CRLF primarily inhabits lower elevations throughout its range and are not known to overwinter or enter into torpor. Suitable habitat within the project area is located within Zone 1 and Zone 2 of the seasonal closures (as identified for each route in Appendix I of the STF Travel Management DEIS). Since Zone 1 is open to year-round use, there would not be any beneficial impacts to the CRLF or it's habitat within this Zone. Since breeding typically occurs in late winter and early spring, restrictions on the season of use within Zone 2 would likely reduce direct effects to breeding adults and those that may be migrating between breeding sites. Furthermore, the closure of routes during the wet weather season reduces soil perturbation and subsequent sedimentation routing into streams associated with all life history stages of the CRLF.

Mitigation Measures: There would not be any mitigation measures implemented within this alternative within or near suitable CRLF habitat. Therefore, these mitigation measures would not have any direct or indirect effects to this species.

Table 31. California Red-legged Frog: Direct and Indirect Effects Indicators - Alternative 5

Alternative 5 - California Red-legged Frog - Direct and Indirect Effects Indicators	
Number of routes which may capture surface run-off and then deliver sediment into a stream associated with the California red-legged frog	0
Number of routes that do not avoid Riparian Reserve (RR) and Riparian Conservation Areas (RCAs) except where necessary to cross streams	0
Number of stream crossings on proposed unauthorized routes within suitable habitat	0
Miles of routes added to the NFTS within 300 feet of suitable aquatic habitat	0
Miles of ML1 roads converted to trails within 300 feet of suitable aquatic habitat	0
Miles of routes added to the NFTS within dispersal habitat	0
Miles of ML1 roads converted to trails within dispersal habitat	0

Cumulative Effects

The California red-legged frog was once numerous and widely distributed in California. Initial declines of the California red-legged frog is attributed to over-harvesting (Jennings and Hayes 1985), and then later to the loss and alteration of habitat (USDI 2002). Other important factors attributed to the decline of the CRLF include the introduction of non-native species (bullfrogs, centrarchid fish, crayfish) which have out-competed and predated on the CRLF and agricultural practices which modify aquatic and upland habitats (Davidson et al. 2002, USDI 2002) . Additional stressors that may have affected the distribution and abundance of the California red-legged frog on the STF, include historic mining, livestock grazing, recreation, and water diversions (USDI 2002). All these activities have the potential to alter California red-legged frog habitat through disturbance to vegetation, soils, and hydrology.

On the STF, a majority of the land containing suitable habitat for the CRLF is within active livestock allotments. The presence of livestock in near-stream environments can result in physical disturbance and livestock in aquatic habitats present a low risk of trampling individuals, particularly tadpoles who have lower mobility and tend to escape into fine sediments. Excessive livestock grazing can impact terrestrial habitats directly from browsing on obligate riparian vegetation that provides cover and feeding habitats for the frog. Excessive livestock grazing can affect aquatic habitats indirectly primarily through erosion and sedimentation processes if the activity occurs in near stream environments. Secondarily, the metabolic waste products may cause minor nutrient enrichment (nitrogen and phosphorus) of aquatic habitats. At present, it is assumed that livestock are having negligible to minor impacts to the frog and its habitats.

Recreational mining activities (suction dredging) have the potential to adversely affect individuals directly from disturbance and possible mortality if tadpoles are entrained by the dredge. Suction dredging involves the modification of aquatic habitat directly from the movement of streambed materials and from riparian area disturbances. Suction dredging occurs in several streams that provide suitable habitat for the frog including but not limited to Bean Creek, Bull Creek, Moore Creek, Rose Creek, and Smith Creek. At present, it is assumed that recreational mining activities are having minor impacts to individuals and habitats.

Timber harvest and other vegetation management projects are occurring on private lands and on lands administered by the STF. A majority of the commercial timber lands are outside of the elevation range of the frog. Harvest on these lands has the potential to impact habitat indirectly primarily through erosion and sedimentation of aquatic habitats. Other vegetation management projects (fuel reduction) do occur within the elevation range of the frog and could affect aquatic and terrestrial habitats through sedimentation and modification of dispersal and upland habitats. Typically, activities in or near RCA are mitigated by applying best management practices (BMP) where equipment and activities are prohibited or minimal. Both public and private timber lands use herbicides for site preparation and to alleviate competition from non-desirable vegetation. The STF has developed a five year plan for managing vegetation on public lands (USDA 2005). There are 10 to 15 projects that are planned or in planning that overlap with areas of suitable habitat. At present, vegetation management activities on private and public lands are having minor impacts to individuals and habitats.

Development of lands adjacent to the STF is also expected to elevate the potential for the introduction of non-native (exotic) species into aquatic systems. Introduced non-native aquatic predators such as centrarchid fishes, crayfish, and bullfrogs are believed to have affected herpetofauna populations in and adjacent to the Forest.

Determinations

Alternative 1

Although this alternative would prohibit cross-country travel, there are several routes proposed within this alternative that have the potential to capture surface run-off and deliver sediment to streams with suitable California red-legged frog habitat. Furthermore, some routes in suitable habitat do not “avoid Riparian Reserve (RR) and Riparian Conservation Areas (RCAs) except where necessary to cross streams”.

Therefore, this alternative would result in a determination of “*May Affect, Likely to Adversely Affect*” for the California red-legged frog.

Alternative 2

Although this alternative would not result in the addition of any routes to the NFTS, cross-country travel would not be prohibited and route proliferation would continue to occur.

Therefore, this alternative would result in a determination of “*May Affect, Likely to Adversely Affect*” for the California red-legged frog.

Alternative 3
Since this alternative would not result in the addition of any routes to the NFTS, there would not be any direct or indirect effects to California red-legged frogs over the short-term. Since cross-country travel would be prohibited, disturbance would be decreased over the long-term and all unauthorized routes within suitable habitat would slowly rehabilitate. The rehabilitation of these routes would result in minor improvements to California red-legged frog habitat over the long-term.

Therefore, it is my determination that this alternative would have "*Fully Beneficial Affects*" on the California red-legged frog.

Alternative 4
Although this alternative would prohibit cross-country travel, there are several routes proposed within this alternative that have the potential to capture surface run-off and deliver sediment to streams with suitable California red-legged frog habitat. Furthermore, some routes in suitable habitat do not "avoid Riparian Reserve (RR) and Riparian Conservation Areas (RCAs) except where necessary to cross streams".

Therefore, this alternative would result in a determination of "*May Affect, Likely to Adversely Affect*" for the California red-legged frog.

Alternative 5
This alternative would prohibit cross-country travel and would not result in the addition of any routes that would have direct or indirect effects to the CRLF.

Therefore, this alternative is consistent with Project Design Criteria (PDC) issued by USDI (2006) and would result in a determination of "*No Effect*" for the California red-legged frog.

Sensitive Species
Foothill Yellow-legged Frog
Rana boylii

Species and Habitat Account
The foothill yellow-legged frog (FYLF) was historically found throughout much of California and southwestern Oregon, but currently occupies only a small portion of its historical range (Amphibiaweb 2008, Jennings and Hayes 1994). Foothill yellow-legged frogs have been extirpated from at least two thirds of their historic localities over their entire Sierran range (Jennings 1996, Lind 2005). Lind (2005) estimated FYLF populations (prior to 1980) have disappeared from approximately 51% of their historic range. Herpetofauna surveys have occurred extensively throughout the STF, but have not covered aquatic habitat within the project area in entirety. Approximately 20% of all perennial streams and 6% of all seasonal streams have been surveyed. Results from these surveys indicate that these frogs have been observed in approximately 18 separate streams throughout the STF. There are many "subpopulations" associated with multiple breeding/occupancy locales in several of these streams.

The FYLF is a highly aquatic amphibian that prefers streams with a rocky substrate. Most occurrences of the frog on the STF occur at elevations below 3,000 feet (Aquasurv 2008), though historic occurrences occurred at elevations up to 4,200 feet (CNDDB 2008). Foothill yellow-legged frogs breed at locations with substrates and channel shapes that provide suitable velocities and depths over a relatively broad range of discharge volumes (Kupferberg 1996). Locally, breeding occurs in late May or early June when water levels become stable enough to reduce the risk of stranding or scour. These frogs prefer partial shade, shallow riffles, and cobble sized or greater substrate (Hayes and Jennings 1988). Kupferberg (1996) reported adult frogs may disperse into small tributary streams with persistent water following breeding and personal

observations on the STF provide support for this report. During all seasons, these frogs are rarely encountered far from permanent water, though foothill yellow-legged frogs have been observed in abandoned rodent burrows and under logs as far as 100 meters from a stream (Zeiner et al. 1988, Welsh 1994). Tadpoles typically use shallow water habitats where warmer water and food resources (diatoms, algae) are plentiful. Adults are likely to use exposed streambeds and riparian areas to forage for a variety of terrestrially- and aquatically-derived insects..

Since surveys of all aquatic habitats have not been conducted systematically for this project, suitable aquatic habitat was conservatively estimated. For the purposes of this analysis, suitable FYLF aquatic habitat has been defined and mapped as all perennial and intermittent streams within the STF below 4,500 feet in elevation. Since field surveys have not been completed on all areas adjacent to suitable aquatic habitat, this analysis assumes that all land within 30 meters of suitable aquatic habitat may provide suitable terrestrial habitat. Since the FYLF is primarily stream dwelling the potential for impacts beyond 30 meters of suitable aquatic habitat is very low and would likely result in negligible effects to the species.

Management Direction

The foothill yellow-legged frog was identified by the Regional Forester as a Sensitive Species on the STF (USDA 2007a). The Forest Plan Direction does not provide any specific management direction related to this project for the foothill yellow-legged frog.

Direct & Indirect Effects

General – All Alternatives

The project alternatives could result in direct and indirect effects to the foothill yellow-legged frog by:

- Prohibiting cross-country travel off of the NFTS,
- Adding facilities to the NFTS,
- Changing the type of use on NFTS routes,
- Changing the season of use on NFTS routes,
- Implementing mitigation measures.

These actions may have direct and indirect effects on foothill yellow-legged frogs through: human-caused mortality, changes in behavior, and habitat modification (see Effects Common to all Aquatic Wildlife). Furthermore, these frogs may be more or less prone to motorized travel management because they are rarely found far from water, the timing and location of breeding suggests they will select a favorable breeding site in highly dynamic stream environments where localized sedimentation may be less important, and they tend to be very dispersed in their distribution within any given stream. However, recently metamorphosed individuals show a strong tendency to migrate away from the natal pool prior to the onset of winter.

Indicators

Based upon the available literature, the following indicators were chosen to provide a relative measure of the direct and indirect effects to the foothill yellow-legged frog. Although biological thresholds for these indicators have not been established, they provide general measures by which the effects of the project alternatives may be compared.

- Number of stream crossings (perennial and intermittent) on routes added to the NFTS within known occupied habitat.
- Number of stream crossings (perennial and intermittent) on ML1 roads converted to trails within known occupied aquatic habitat.
- Miles of routes added to the NFTS within 30 meters of known occupied aquatic habitat.
- Miles of ML1 roads converted to trails within 30 meters of known occupied habitat
- Number of stream crossings (perennial and intermittent) on routes added to the NFTS within suitable aquatic habitat.
- Number of stream crossings (perennial and intermittent) on ML1 roads converted to trails within suitable aquatic habitat.

- Miles of routes added to the NFTS within 30 meters of suitable aquatic habitat.
- Miles of ML1 roads converted to trails within 30 meters of suitable aquatic habitat.

Alternative 1

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 occupied and suitable foothill yellow-legged frog habitat. This would reduce the risk of direct and indirect effects to these frogs from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 1, several analyses were completed (Table 32). This alternative would result in the addition of one route with one stream crossing within occupied foothill yellow-legged frog habitat and several routes with 61 stream crossings within suitable habitat. These stream crossings would likely result in direct and indirect effects to some individuals of all FYLF life history stages. The addition of routes and conversion of roads to trails within 100 meters of occupied and suitable aquatic habitat would likely result in direct effects to a few juvenile and adult FYLF and would result in indirect effects to both aquatic and terrestrial habitat over the short and long-term. Since these impacts would affect a very small percentage of suitable and occupied habitat (Table 36), these actions would likely impact some individuals but would not likely result in impacts to populations within the project area over the short or long-term.

Season of Use: The FYLF is not known to enter into torpor, but has been found overwintering as far as 100 meters from aquatic habitat. Approximately 73% of suitable FYLF habitat is within Zone 2 and Zone 3 of the seasonal closures (as identified for each route in Appendix I of the STF Travel Management DEIS). Therefore, this would reduce the potential direct effects to a significant portion of potential overwintering juveniles and adults. Furthermore, the closure of routes during the wet weather season reduces soil perturbation and sedimentation into streams associated with all life history stages of the FYLF.

Mitigation Measures: The only type of mitigation measure proposed on routes that are associated with occupied FYLF habitat are log/rock barriers. Types of mitigation measures proposed on routes associated with suitable FYLF habitat include: barriers, tread hardening, drain dips, a hardened stream crossing, and a small bridge. The installation of a hardened stream crossing and a small bridge would likely result in a short-term increase in sedimentation which may impact some individuals. The installation of all mitigation measures may result in short-term disturbance to some individual frogs, but will limit trail widening, reduce soil perturbation, and reduce sedimentation, providing beneficial effects over the long-term.

Table 32. Foothill Yellow-legged Frog: Direct and Indirect Effects Indicators - Alternative 1

Alternative 1 - Foothill Yellow-legged Frog - Direct and Indirect Effects Indicators	
Number of stream crossings (perennial and intermittent) on routes added to the NFTS within known occupied aquatic habitat	1
Number of stream crossings (perennial and intermittent) on ML1 roads converted to trails within known occupied aquatic habitat	0
Miles of routes added to the NFTS within 30 meters of known occupied aquatic habitat	0.28
Miles of ML1 roads converted to trails within 30 meters of known occupied habitat	0.11
Percentage of upland habitat (within 30 meters of occupied aquatic habitat) directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%
Number of stream crossings (perennial and intermittent) on routes added to the NFTS within suitable aquatic habitat	51

Number of stream crossings (perennial and intermittent) on ML1 roads converted to trails within suitable aquatic habitat	10
Miles of routes added to the NFTS within 30 meters of suitable aquatic habitat	5.91
Miles of ML1 roads converted to trails within 30 meters of suitable aquatic habitat	1.68
Percentage of upland habitat (within 30 meters of suitable aquatic habitat) directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%

Alternative 2
Cross-Country Travel: Cross-country travel would not be prohibited under this alternative. Therefore it is assumed that route proliferation would continue over the short and long-term and the effects would be similar to those discussed below for adding routes to the NFTS.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: Although this alternative would not result in the addition of any miles of unauthorized routes to the NFTS, vehicles would be allowed to use all existing motorized trails because cross-country travel would be allowed. Therefore, it is assumed that wheeled motorized vehicles will continue to use all of the documented unauthorized routes previously identified and continue to create new routes. The use of these routes and the continued proliferation of new routes would result in increasing amounts of direct and indirect effects to these frogs. These effects would be similar to those discussed within Alternative 4 for the short-term, but would be exacerbated over the long-term by the continued proliferation of routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would reduce potential disturbance to individual frogs.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 3
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 occupied and suitable foothill yellow-legged frog habitat. This would reduce the risk of direct and indirect effects to these frogs from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: This alternative would not result in the addition of any motorized routes to the NFTS, nor would it change the type of use on any current NFTS routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would reduce potential direct and indirect effects to the FYLF.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 4
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 occupied and suitable foothill yellow-legged frog habitat. This would reduce the risk of direct and indirect effects to these frogs from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 4, several analyses were completed (Table 33). Direct and indirect effects of the actions proposed in this alternative would be similar to those discussed in Alternative 1. Since there is a slight increase from Alternative 1 in the number of routes added to the system or converted to a trail within suitable FYLF habitat, there would be a slight increase in the direct and indirect effects to these frogs within the project area. Although these increases would result in more individuals being impacted, these increases would not likely be significant enough to result in impacts to FYLF populations within the project area.

Season of Use: The FYLF is not known to enter into torpor, but has been found overwintering as far as 100 meters from aquatic habitat. Approximately 73% of suitable FYLF habitat is within Zone 2 and Zone 3 of the seasonal closures (as identified for each route in Appendix I of the STF Travel Management DEIS). Therefore, this would reduce the potential direct effects to a significant portion of potential overwintering juveniles and adults. Furthermore, the closure of routes during the wet weather season reduces soil perturbation and sedimentation into streams associated with all life history stages of the FYLF.

Mitigation Measures: The types and effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 33. Foothill Yellow-legged Frog: Direct and Indirect Effects Indicators - Alternative 4

Alternative 4 - Foothill Yellow-legged Frog - Direct and Indirect Effects Indicators	
Number of stream crossings (perennial and intermittent) on routes added to the NFTS within known occupied aquatic habitat	1
Number of stream crossings (perennial and intermittent) on ML1 roads converted to trails within known occupied aquatic habitat	0
Miles of routes added to the NFTS within 30 meters of known occupied aquatic habitat	0.28
Miles of ML1 roads converted to trails within 30 meters of known occupied habitat	0.18
Percentage of upland habitat (within 30 meters of occupied aquatic habitat) directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%
Number of stream crossings (perennial and intermittent) on routes added to the NFTS within suitable aquatic habitat	53
Number of stream crossings (perennial and intermittent) on ML1 roads converted to trails within suitable aquatic habitat	21
Miles of routes added to the NFTS within 30 meters of suitable aquatic habitat	6.22
Miles of ML1 roads converted to trails within 30 meters of suitable aquatic habitat	3.31
Percentage of upland habitat (within 30 meters of suitable aquatic habitat) directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%

Alternative 5

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 occupied and suitable foothill yellow-legged frog habitat. This would reduce the risk of direct and indirect effects to these frogs from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 5, several analyses were completed (Table 34). Direct and indirect effects of the actions proposed in this alternative would be similar to those discussed in Alternative 1. Since there is a decrease from Alternative 1 in the number of routes added to the system or converted to a trail within suitable and occupied FYLF habitat, there would be a significant decrease in the direct and indirect effects to these frogs within the project area. Since these impacts would affect a very small percentage of suitable and occupied habitat (Table 34), these actions would likely impact some individuals but would not likely result in impacts to populations within the project area over the short or long-term.

Season of Use: The FYLF is not known to enter into torpor, but has been found overwintering as far as 100 meters from aquatic habitat. Approximately 73% of suitable FYLF habitat is within Zone 2 and Zone 3 of the seasonal closures (as identified for each route in Appendix I of the STF Travel Management DEIS). Therefore, this would reduce the potential direct effects to a significant portion of potential overwintering juveniles and adults. Furthermore, the closure of routes during the wet weather season reduces soil perturbation and sedimentation into streams associated with all life history stages of the FYLF.

Mitigation Measures: The types and effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 34. Foothill Yellow-legged Frog: Direct and Indirect Effects Indicators - Alternative 5

Alternative 5 - Foothill Yellow-legged Frog - Direct and Indirect Effects Indicators	
Number of stream crossings (perennial and intermittent) on routes added to the NFTS within known occupied aquatic habitat	0
Number of stream crossings (perennial and intermittent) on ML1 roads converted to trails within known occupied aquatic habitat	0
Miles of routes added to the NFTS within 30 meters of known occupied aquatic habitat	0.02
Miles of ML1 roads converted to trails within 30 meters of known occupied habitat	0
Percentage of upland habitat (within 30 meters of occupied aquatic habitat) directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%
Number of stream crossings (perennial and intermittent) on routes added to the NFTS within suitable aquatic habitat	20
Number of stream crossings (perennial and intermittent) on ML1 roads converted to trails within suitable aquatic habitat	1
Miles of routes added to the NFTS within 30 meters of suitable aquatic habitat	1.39
Miles of ML1 roads converted to trails within 30 meters of suitable aquatic habitat	0.05
Percentage of upland habitat (within 30 meters of suitable aquatic habitat) directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%

Cumulative Effects

Many past cumulative impacts have likely contributed to the decline in FYLF numbers and distribution. The reduction in foothill yellow-legged frog distribution and population numbers has largely been attributed to loss or alteration of habitats and increased competition/predation from introduced species. Habitat loss and alteration is associated with the following management

activities on the STF: livestock grazing, mining, water development projects, vegetation management, and pesticide exposure.

Historic livestock grazing likely had a significant cumulative impact to FYLF and their habitat. Historic livestock grazing evidence indicates that heavy livestock use in the Sierra Nevada led to riparian habitat degradation across much of the Sierra Nevada. Livestock trampling has the potential to directly kill most life stages of FYLF. The mortality risk from livestock trampling is greatest for tadpoles and recently metamorphosed frogs. Tadpoles have limited mobility and have a tendency to seek cover in the spaces between streambed substrates. By seeking cover in this manner, tadpoles may be unaware of the potential peril from trampling. The risk is particularly high in intermittent streams where water resources may be limited and livestock have few options for accessing water. Risk is also higher following metamorphosis when metamorphs are concentrated along aquatic margins. Sedimentation arising from concentrated livestock use areas is considered to be the biggest impact to FYLF habitat. Ten active livestock allotments overlap known localities of the foothill yellow-legged frog and suitable foothill yellow-legged frog habitat (no known detections) overlaps with an additional 4 allotments. Livestock grazing is considered to currently have a very minor impact on individuals and habitat on the STF.

As with the California red-legged frog, recreational gold mining activities overlap with known occupied FYLF sites and the activity has the potential to impact individuals and habitat. Tadpoles are potentially vulnerable to being sucked into the dredge and mortality or injury could result. Suction dredging also presents a physical disturbance to frogs and prolonged dredging could affect the distribution of individuals in a stream. Some of the actions involved with suction dredging include moving streambed substrates, digging into streambanks, and loss of riparian vegetation. At some locations, there has been a modification of rearing habitat resulting in the loss of shallow, warm water foraging habitat for tadpoles. Also, the rearrangement of streambed substrates has the potential to change the streamflow patterns thereby affecting the suitability of habitat for deposition of egg masses. Suction dredging occurs at six to ten of the known occupied streams. Suction dredging is considered to currently have a minor impact on individuals and to moderate impact on habitat.

Water development projects have resulted in the loss of suitable habitat and have reduced the suitability of habitat for the frog. Hydroelectric projects or impoundments are present on all major rivers on the STF with the exception of the Clavey River. The New Melones Reservoir and Don Pedro Reservoir effectively eliminated dozens of miles of suitable habitat when they were impounded. These reservoirs also effectively eliminated the potential for individuals to move between watersheds. Several impoundments located upstream of suitable habitat have modified stream discharge patterns and water temperatures. Lind et al. (1996) and Bobzien and DiDonato (2007) documented reduced breeding success downstream of dams due to releases of water that either strand or scour egg masses from their attachment sites. Reduced water temperatures may delay breeding or may delay the development of tadpoles which may affect survivorship upon metamorphosis. Water developments have had a major impact on individuals and habitat in the past. Currently, water developments are having a moderate impact on individuals and habitat.

Vegetation management activities have the potential to impact individuals and habitat if activities occur in close proximity to occupied habitat. Ground disturbing activities, including timber harvest, have the potential to result in sedimentation of habitats with primary implications for tadpole survivorship and fitness. Prescribed fire in riparian areas may result in mortality of individuals or a disturbance of behavior. Prescribed fire also has the potential to modify riparian habitats if the fire is severe enough to consume woody and herbaceous species. Modification of habitat may locally reduce the suitability of riparian habitat for refuge and foraging activities; however, fire may be beneficial in providing a diversity of conditions that may meet the needs of the frog. In general, current vegetation and fuels projects are designed to reduce potential impact on FYLF habitats and minimize disturbance to the species. Best management practices are implemented and monitored to minimize sediment delivery to streams and to prevent unexpected consequences to riparian habitats. The STF has developed a five year plan for managing

vegetation on public lands (USDA 2005) and there are 10 to 15 projects that are planned or in planning that overlap with areas of occupied/suitable habitat. At present, vegetation management activities on private and public lands are having minor impacts to individuals and habitats. Historically, vegetation management and fuels reduction projects likely had minor to moderate impacts on FYLF and habitats, especially if project activities occurred in or immediately adjacent to FYLF aquatic habitats.

Exposure to a variety of pesticides has the potential to impact individuals. Pesticides are introduced into the aquatic environment either through direct application, groundwater contamination, and/or drift. Herbicides are commonly used in forestry to establish plantations and to release the growing conifers from competition. The STF and private forestry have applied herbicides extensively across the forest and in proximity to occupied and suitable habitat for the FYLF. Monitoring on the STF has shown that herbicide applications have resulted in very low concentrations of herbicide contaminating aquatic habitats in the past. One project on the STF is in the planning stage that would propose to apply herbicides for site preparation and release in close proximity to occupied FYLF habitat. Herbicides are and have been extensively used on private forest lands. Lenoir et al. (1999) and Sparling et al. (2001) showed a variety of pesticides are present in precipitation falling in the Sierra Nevada, a result of drift from agricultural applications in the Central Valley of California. The implications of this drift are poorly understood; however, Davidson et al. (2002) used spatial tests to link upwind herbicide application with the decline of the FYLF. Pesticide exposure is currently having a very minor impact on individuals, but historic applications likely had a minor to moderate impact on individuals.

Introduced species have the potential to impact the FYLF primarily through increased competition and predation. Kupferberg (1997) showed grazing competition from bullfrog tadpoles reduced the survivorship and mass at metamorphosis of FYLF tadpoles. Kupferberg (1997) also reported foothill yellow-legged frogs were rarely encountered in areas invaded by bullfrogs, suggesting a population-level impact. Bullfrogs have been observed across the STF, typically at lower elevations (<3,000 feet) and within the range of the FYLF (Aquasurv 2008). Fellers (2005) reports non-native bullfrogs and fish (green sunfish) are predators on the FYLF. As Moyle (1973), Jennings and Hayes (1994), and Jennings (1996) suggest, water developments (dams and diversions) may be responsible for the introduction of non-native game fish and for modifying habitats that facilitate the invasion of aquatic habitats by non-native species. Non-native game fish are found below and above many low elevation impoundments on the STF. Introduced species have had a minor to moderate impact on FYLF populations in the past, and the expectation is that competition from bullfrogs will increase as this species expands its range on the forest.

Determinations

Alternative 1

This alternative may result in minor amounts of human-caused mortality, would likely increase disturbance to some individuals, and would result in minor amounts of habitat modification within the project area, but these effects would be limited over the long-term since cross-country travel would be prohibited. Since the direct effects would be limited to only some individuals and the indirect effects would impact only a small percentage of occupied and suitable habitat, this alternative would not likely result in any measurable impacts to FYLF populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the foothill yellow-legged frog.

Alternative 2

Although this alternative would result in increased amounts of human-caused mortality, disturbance, and habitat fragmentation within the project area, continued route proliferation within occupied and suitable habitat would ultimately be limited by topography and vegetation. These direct and indirect effects would likely result in adverse impacts to some individuals over short and long-term. Since route proliferation near suitable and occupied habitat would be limited over the long-term by topography and vegetation, these effects would relatively minor but may have minor impacts on some populations within the project area. Although minor impacts may occur to some populations, these are not likely to result in the loss of any populations within the project area.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the foothill yellow-legged frog.

Alternative 3
Cross-country travel would be prohibited and there would not be any motorized routes added to the NFTS in this alternative. Prohibiting cross-country travel would reduce future impacts to the foothill yellow-legged frog and prevent further fragmentation of their habitat over the short and long-term.

Therefore, it is my determination that this alternative would have a "*Beneficial Impact*" on the foothill yellow-legged frog.

Alternative 4
This alternative may result in minor amounts of human-caused mortality, would likely increase disturbance to some individuals, and would result in minor amounts of habitat modification within the project area, but these effects would be limited over the long-term since cross-country travel would be prohibited. Since the direct effects would be limited to only some individuals and the indirect effects would impact only a small percentage of occupied and suitable habitat, this alternative would not likely result in any measurable impacts to FYLF populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the foothill yellow-legged frog.

Alternative 5
This alternative may result in minor amounts of human-caused mortality, would likely increase disturbance to some individuals, and would result in minor amounts of habitat modification within the project area, but these effects would be limited over the long-term since cross-country travel would be prohibited. Since the direct effects would be limited to only some individuals and the indirect effects would impact only a small percentage of occupied and suitable habitat, this alternative would not likely result in any measurable impacts to FYLF populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the foothill yellow-legged frog.

Mountain Yellow-legged Frog
Rana muscosa

Species and Habitat Account
Historically the mountain yellow-legged frog (MYLF) was extremely abundant within high elevation aquatic ecosystems of the Sierra Nevada Mountains (Grinnell and Storer 1924, Zweifel

1955). Beginning around the 1970s, the MYLF has undergone dramatic population declines throughout the Sierra Nevada (Knapp and Matthews 2000, ranging between 50-90% decline of their historic localities (USDI 2004). Although they are found throughout most of their historic range, many populations within their range have become extirpated (Amphibiaweb 2008). Previously the mountain yellow-legged frog in the Sierra Nevada was considered to be one species; Rana muscosa. Recent genetic studies indicate mountain yellow-legged frogs in the Sierra Nevada are comprised of two species: R. sierrae, with a distribution in the northern and central Sierra Nevada, and R. muscosa, with a distribution in the southern Sierra Nevada and southern California. The contact zone for these two newly recognized species is in the vicinity of Mather Pass and the Monarch Divide, Fresno County (Vredenburg et al. 2006). Though the Regional Forester's list of sensitive species has not been revised to specifically address this apparent change in taxonomy, it is assumed that this analysis pertains to R. sierrae, the Sierra Nevada yellow-legged frog.

Over the last 15 years herpetofauna surveys have provided broad spatial coverage of aquatic habitat within the STF, but surveys were not systematic nor did they cover all potential FYLF habitat. Approximately 10-15% of all perennial streams, and 40-60% of lakes/ponds, within the elevational range of this species have been surveyed. Frogs have been found in at least 40 distinct sites forest-wide, most of which were located in designated wilderness areas.

Mountain yellow-legged frogs in the Sierra Nevada inhabit high mountain lakes, ponds, tarns, and streams, largely in areas that were glaciated (Zweifel 1955). These frogs occur in the Sierra Nevada from 4,500 feet to over 12,000 feet elevation (Jennings and Hayes 1994) however, local observations have all occurred above 5,400 feet and 95% of all observations are above 7,000 feet (Aquasurv 2008). Mountain yellow-legged frogs are seldom far from water, although they have been observed moving overland to disperse to other pond habitats. Typically, these frogs prefer well illuminated, sloping banks of meadow streams, riverbanks, isolated pools, and lake borders with vegetation that is continuous to the water's edge (Martin 1992, Zeiner et al. 1988).Most of the populations on the STF occur within fish-free lakes and ponds within wilderness areas and in fish-free lakes and ponds above 5,500' in elevation, but they are known to occur within some streams as well.

Since systematic surveys of all aquatic habitats have not been conducted as a part of this project, suitable aquatic was conservatively estimated. For the purposes of this analysis, suitable MYLF aquatic habitat has been defined and mapped as all perennial streams, lakes, and ponds above 5,500 feet in elevation. Since field surveys have not been completed on all areas adjacent to suitable aquatic habitat, this analysis assumes that all land within 30 meters of suitable aquatic habitat may provide suitable terrestrial habitat. Since the MYLF is highly aquatic and typically seen within one meter of the water's edge, the potential for impacts beyond 30 meters of suitable aquatic habitat is very low and would likely result in negligible effects to the species.

Management Direction

The mountain yellow-legged frog was identified by the Regional Forester as a Sensitive Species on the STF (USDA 2007a). The Forest Plan Direction does not provide any specific management direction related to this project for the mountain yellow-legged frog.

Direct & Indirect Effects

General – All Alternatives

The project alternatives could result in direct and indirect effects to the mountain yellow-legged frog by:

- Prohibiting cross-country travel off of the NFTS,
- Adding facilities to the NFTS,
- Changing the type of use on NFTS routes,
- Changing the season of use on NFTS routes,
- Implementing mitigation measures.

These actions may have direct and indirect effects on mountain yellow-legged frogs through: human-caused mortality, changes in behavior, and habitat modification (see Effects Common to all Aquatic Wildlife). Furthermore, these frogs may be more or less prone to motorized travel management because they are closely associated with aquatic features and less likely to be exposed to direct mortality. They presumably do not make long distance migrations outside of the breeding season, remaining close to suitable aquatic habitat. In streams, the larvae of the MYLF are typically associated with deeper pool habitats that have limited potential for direct mortality.

Indicators
Based upon the available literature, the following indicators were chosen to provide a relative measure of the direct and indirect effects to the mountain yellow-legged frog. Although biological thresholds for these indicators have not been established, they provide general measures by which the effects of the project alternatives may be compared.

- Number of stream crossings (perennial) on routes added to the NFTS within known occupied habitat.
- Number of stream crossings (perennial) on ML1 roads converted to trails within known occupied aquatic habitat.
- Miles of routes added to the NFTS within 30 meters of known occupied aquatic habitat.
- Miles of ML1 roads converted to trails within 30 meters of known occupied habitat
- Number of stream crossings (perennial) on routes added to the NFTS within suitable aquatic habitat.
- Number of stream crossings (perennial) on ML1 roads converted to trails within suitable aquatic habitat.
- Miles of routes added to the NFTS within 30 meters of suitable aquatic habitat.
- Miles of ML1 roads converted to trails within 30 meters of suitable aquatic habitat.

Alternative 1
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 occupied and suitable mountain yellow-legged frog habitat. This would reduce the risk of direct and indirect effects to these frogs from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 1, several analyses were completed (Table 35). This alternative would not result in the addition of any stream crossings within occupied mountain yellow-legged frog habitat, but would result in the addition of 8 stream crossings within suitable habitat. These stream crossings may result in direct and indirect effects to some individuals of all MYLF life history stages. The addition of routes and conversion of roads to trails within 30 meters of occupied and suitable aquatic habitat would likely result in direct effects to a few juvenile and adult MYLF and would result in indirect effects to both aquatic and terrestrial habitat over the short and long-term. Since these impacts would affect a very small percentage of suitable and occupied habitat, these actions would likely impact some individuals but would not likely result in impacts to populations within the project area over the short or long-term.

Season of Use: The MYLF inhabits higher elevations and spends the cold winter months in torpor. All occupied and suitable MYLF habitat would be within Zone 2 and Zone 3 of the seasonal closures (as identified for each route in Appendix I of the STF Travel Management DEIS). Since these frogs typically overwinter in aquatic habitat (mountain lakes or deep pools) the use of wheeled motor vehicles during the winter months would have very little impact on them. Although impacts are expected to be minimal during the winter, these closures may provide some additional protection prior to these frogs entering torpor in fall and after emergence in the spring. Furthermore, the closure of routes during the wet weather season reduces soil perturbation and sedimentation into streams associated with all life history stages of the MYLF.

Mitigation Measures: There would not be any mitigation measures proposed on routes that are associated with occupied MYLF habitat. Types of mitigation measures proposed on routes associated with suitable MYLF habitat include: barriers, tread hardening, drain dips, and a hardened stream crossing. The installation of a hardened stream crossing would likely result in a short-term increase in sedimentation which may impact some individuals. The installation of all mitigation measures may result in short-term disturbance to some individual frogs, but will limit trail widening, reduce soil perturbation, and reduce sedimentation, providing beneficial effects over the long-term.

Table 35. Mountain Yellow-legged Frog: Direct and Indirect Effects Indicators - Alternative 1

Alternative 1 - Mountain Yellow-legged Frog - Direct and Indirect Effects Indicators	
Number of stream crossings (perennial) on routes added to the NFTS within known occupied aquatic habitat	0
Number of stream crossings (perennial) on ML1 roads converted to trails within known occupied aquatic habitat	0
Miles of routes added to the NFTS within 30 meters of known occupied aquatic habitat	0
Miles of ML1 roads converted to trails within 30 meters of known occupied habitat	0.02
Percentage of upland habitat (within 30 meters of occupied aquatic habitat) directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%
Number of stream crossings (perennial) on routes added to the NFTS within suitable aquatic habitat	2
Number of stream crossings (perennial) on ML1 roads converted to trails within suitable aquatic habitat	6
Miles of routes added to the NFTS within 30 meters of suitable aquatic habitat	1.19
Miles of ML1 roads converted to trails within 30 meters of suitable aquatic habitat	0.61
Percentage of upland habitat (within 30 meters of suitable aquatic habitat) directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%

Alternative 2

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

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: Although this alternative would not result in the addition of any miles of unauthorized routes to the NFTS, vehicles would be allowed to use all existing motorized trails because cross-country travel would be allowed. Therefore, it is assumed that wheeled motorized vehicles will continue to use all of the documented unauthorized routes previously identified and continue to create new routes. The use of these routes and the continued proliferation of new routes would result in increasing amounts of direct and indirect effects to these frogs. These effects would be similar to those discussed within Alternative 4 for the short-term, but would be exacerbated over the long-term by the continued proliferation of routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would reduce potential disturbance to these frogs.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 3
Cross-Country Travel: Cross-country travel would not be prohibited under this alternative. Therefore it is assumed that route proliferation would continue over the short and long-term and the effects would be similar to those discussed below for adding routes to the NFTS.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: This alternative would not result in the addition of any miles of unauthorized routes to the NFTS and would not change the use on any NFTS routes, but there would not be any restrictions on cross-country travel. Therefore, it is assumed that wheeled motorized vehicles would continue to use all of the documented unauthorized routes previously identified and continue to create new unauthorized routes. The use of all documented unauthorized routes and the continued proliferation of routes would result in increasing amounts of direct and indirect effects to the MYLF and its habitat. These effects would be similar to those discussed within Alternative 4 for the short-term, but would be exacerbated over the long-term by the continued proliferation of routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would reduce potential direct and indirect effects to the MYLF.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 4
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 occupied and suitable mountain yellow-legged frog habitat. This would reduce the risk of direct and indirect effects to these frogs from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 4, several analyses were completed (Table 36). Direct and indirect effects of the actions proposed in this alternative would be similar to those discussed in Alternative 1. Since there is a slight increase from Alternative 1 in the number of ML1 roads converted to a trail within suitable MYLF habitat, there would be a slight increase in the direct and indirect effects to these frogs within the project area. Although these increases may result in more individuals being impacted, these increases would not likely be significant enough to result in impacts to MYLF populations within the project area.

Season of Use: The MYLF inhabits higher elevations and spends the cold winter months in torpor. All occupied and suitable MYLF habitat would be within Zone 2 and Zone 3 of the seasonal closures (as identified for each route in Appendix I of the STF Travel Management DEIS). Since these frogs typically overwinter in aquatic habitat (mountain lakes or deep pools) the use of wheeled motor vehicles during the winter months would have very little impact on them. Although impacts are expected to be minimal during the winter, these closures may provide some additional protection prior to these frogs entering torpor in fall and after emergence in the spring. Furthermore, the closure of routes during the wet weather season reduces soil perturbation and sedimentation into streams associated with all life history stages of the MYLF.

Mitigation Measures: The effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 36. Mountain Yellow-legged Frog: Direct and Indirect Effects Indicators - Alternative 4

Alternative 4 - Mountain Yellow-legged Frog - Direct and Indirect Effects Indicators	
Number of stream crossings (perennial) on routes added to the NFTS within known occupied aquatic habitat	0
Number of stream crossings (perennial) on ML1 roads converted to trails within known occupied aquatic habitat	0
Miles of routes added to the NFTS within 30 meters of known occupied aquatic habitat	0
Miles of ML1 roads converted to trails within 30 meters of known occupied habitat	0.02
Percentage of upland habitat (within 30 meters of occupied aquatic habitat) directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%
Number of stream crossings (perennial) on routes added to the NFTS within suitable aquatic habitat	2
Number of stream crossings (perennial) on ML1 roads converted to trails within suitable aquatic habitat	7
Miles of routes added to the NFTS within 30 meters of suitable aquatic habitat	1.19
Miles of ML1 roads converted to trails within 30 meters of suitable aquatic habitat	0.63
Percentage of upland habitat (within 30 meters of suitable aquatic habitat) directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%

Alternative 5

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 occupied and suitable mountain yellow-legged frog habitat. This would reduce the risk of direct and indirect effects to these frogs from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 5, several analyses were completed (Table 37). This alternative would not result in the addition of any stream crossings within occupied or suitable mountain yellow-legged frog habitat. The conversion of approximately 0.26 miles of roads to trails within 30 meters of suitable aquatic habitat may result in direct effects to very few juvenile and adult MYLF. The conversion of this route to trail may result in minor indirect effects to both aquatic and terrestrial habitat over the short and long-term. Since these impacts would affect a very small percentage of suitable and occupied habitat, these actions would likely impact some individuals but would not likely result in impacts to populations within the project area over the short or long-term.

Season of Use: The MYLF inhabits higher elevations and spends the cold winter months in torpor. All occupied and suitable MYLF habitat would be within Zone 2 and Zone 3 of the seasonal closures (as identified for each route in Appendix I of the STF Travel Management DEIS). Since these frogs typically overwinter in aquatic habitat (mountain lakes or deep pools) the use of wheeled motor vehicles during the winter months would have very little impact on them. Although impacts are expected to be minimal during the winter, these closures may provide some additional protection prior to these frogs entering torpor in fall and after emergence in the spring. Furthermore, the closure of routes during the wet weather season reduces soil perturbation and sedimentation into streams associated with all life history stages of the MYLF.

Mitigation Measures: The effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 37. Mountain Yellow-legged Frog: Direct and Indirect Effects Indicators - Alternative 5

Alternative 5 - Mountain Yellow-legged Frog - Direct and Indirect Effects Indicators	
Number of stream crossings (perennial) on routes added to the NFTS within known occupied aquatic habitat	0
Number of stream crossings (perennial) on ML1 roads converted to trails within known occupied aquatic habitat	0
Miles of routes added to the NFTS within 30 meters of known occupied aquatic habitat	0
Miles of ML1 roads converted to trails within 30 meters of known occupied habitat	0
Percentage of upland habitat (within 30 meters of occupied aquatic habitat) directly impacted by routes added to the NFTS or ML1 roads converted to trails	0%
Number of stream crossings (perennial) on routes added to the NFTS within suitable aquatic habitat	0
Number of stream crossings (perennial) on ML1 roads converted to trails within suitable aquatic habitat	0
Miles of routes added to the NFTS within 30 meters of suitable aquatic habitat	0.26
Miles of ML1 roads converted to trails within 30 meters of suitable aquatic habitat	0
Percentage of upland habitat (within 30 meters of suitable aquatic habitat) directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%

Cumulative Effects

Many past and current cumulative impacts have contributed to the decline in mountain yellow-legged frog numbers and distribution. One factor attributed to wide-scale population declines of the mountain yellow-legged frog has been the introduction of salmonid fishes during the last century (Bradford et al. 1993, Knapp 1993, Knapp 1996). Recently, it has been determined that a chytridomycete fungus has been associated with numerous MYLF die-offs in the Sierra Nevada of California (Rachowicz 2006). Other factors that have contributed to cumulative impacts to the species includes pesticides, ultraviolet radiation; bacterial, fungal, and viral pathogens; acidification from the atmospheric deposition; nitrate deposition; livestock grazing; recreational activities; and drought have all been identified as potential factors affecting the species and its habitat (USDA 2001).

Introduced trout species within high mountain lakes has severely affected mountain yellow-legged frog population trends in the Sierra Nevada including the STF. In recent years, the California Department of Fish and Game has actively addressing this issue to proactively manage for mountain yellow-legged frog restoration opportunities while still providing a recreational fisheries within high mountain lakes. Recent experimental efforts to remove introduced trout species from high mountain lakes has shown that mountain yellow-legged frog populations may positively respond. Non-native game fish are found in many high mountain lakes on the STF and have likely had a major impact on MYLF populations in the past. Although some actions are presently being taken to mitigate the impacts of introduced game fish, it is costly, labor intensive, and difficult to remove fish populations from some high mountain lakes. Therefore, they will likely continue to have significant impacts on the ability of MYLF populations to grow and expand on the STF in the future.

The chytrid fungus Batrachochytrium dendrobatidis has recently been determined to be common within MYLF populations within the Sierra Nevada and that it has likely played a significant role in population declines (Fellers et al. 2001, Rachowicz et al. 2006). Although it is well documented that this fungus may play a significant role in population declines, its dispersal ability is not currently well understood (Rachowicz 2006). Without further research, it is difficult to determine the level of risk motorized use and access may have on the dispersal of this disease.

Historic livestock grazing likely had a significant cumulative impact to this species and their habitat. Historic livestock grazing evidence indicates that heavy livestock use in the Sierra Nevada led to riparian habitat degradation across much of the Sierra Nevada. Livestock trampling has the potential to directly kill all life stages of MYLF. The greatest potential of mortality risk from livestock trampling is expected to occur when adult MYLF aggregate and lay egg masses in the early season, and during metamorphosis, when juveniles are metamorphosing along aquatic margins. Current standards and guidelines in the Sierra Nevada Forest Plan Amendment were implemented to reduce the risk of trampling by livestock (USDA 2004). Known mountain yellow-legged frog habitat sites currently overlap with 9 active livestock grazing allotments. Potential mountain yellow-legged frog habitat overlaps with approximately 18 additional allotments. Management direction including standards and guidelines for grazing should reduce potential grazing impacts from livestock grazing over the long-term.

Historic vegetation management and fuels reduction projects have likely contributed to past and present cumulative affects, especially if projects occurred adjacent to MYLF aquatic habitats. Ground disturbing activities including timber harvest and fuels treatment projects (burning and mastication projects) potentially caused direct mortality to this species which may have affected the abundance of the species on the STF. In general, current vegetation and fuels projects are designed to reduce potential impacts on MYLF habitats, and therefore, minimize disturbance to the species. However, as MYLF migrate between breeding sites, and between breeding sites and overwintering sites (usually in or very near water), there is some potential for direct impacts from being crushed or burned from vegetation and fuels projects. In general the magnitude of this happening across the range of the MYLF frog habitats on the STF should be limited given the timing of MYLF migration which is in the spring, with the exception to spring prescribed burning projects. In general, the adverse impacts of spring burning is expected to be low given the relatively low amount that occurs on the Forest within an average year.

Recreation use has increased and is expected to continue to increase on the STF (see Recreation section Affected Environment), resulting in greater likelihood and magnitude of human disturbance to aquatic wildlife. OHV use has been increasing at an even more rapid pace than other forms of recreation, based upon State figures for OHV sales (see Recreation section). The project alternatives would contribute to these past and current conditions with added displacement from noise and human activity, and indirect effects to aquatic habitat. In the future, there is approximately 5 miles of new trail construction that is proposed to be added to the NFTS as well as numerous short route segments for dispersed camping access. These trails are proposed to provide “connector routes” between existing NFTS routes and motorized access to historical dispersed camping opportunities.

Although motorized vehicle use has not been identified as one a major contributing factors to MYLF declines, the direct and indirect effects of the project alternatives would likely contribute to cumulative effects for this species. Because Alternative 2 does not prohibit cross-country travel, there is a high degree of uncertainty about future route proliferation and associated cumulative impacts upon FYLF. Alternative 3 would prohibit cross-country travel and would not add any routes to the NFTS, therefore the effects of this alternative would be beneficial. Alternatives 1, 4, and 5 contribute cumulatively to the disturbance and habitat alteration from activities described above. Alternatives 4, 1, and 5 would result in progressively lower risk to these frogs due to the amount of motorized routes being added to the system. These alternatives do not result in a loss of habitat (no route construction), but would likely influence habitat suitability. Although the action

alternatives may result in additional cumulative impacts, they are very minor in comparison to other factors affecting this species.

Determinations

Alternative 1
This alternative may result in minor amounts of human-caused mortality, may increase disturbance to some individuals, and would result in minor amounts of habitat modification within the project area, but these effects would be limited over the long-term since cross-country travel would be prohibited. Since the direct effects would be limited to only some individuals and the indirect effects would impact only a small percentage of occupied and suitable habitat, this alternative would not likely result in any impacts to MYLF populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the mountain yellow-legged frog.

Alternative 2
Although this alternative would result in increased amounts of human-caused mortality, disturbance, and habitat fragmentation within the project area, continued route proliferation within and near occupied and suitable habitat would be limited by topography, vegetation, and wilderness areas. These direct and indirect effects would likely result in adverse impacts to some individuals over short and long-term. Since route proliferation near suitable and occupied habitat would be limited over the long-term by topography, vegetation, and wilderness areas these impacts would not likely result in measurable impacts to populations within the project area.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the mountain yellow-legged frog.

Alternative 3
Cross-country travel would be prohibited and there would not be any motorized routes added to the NFTS in this alternative. Prohibiting cross-country travel would reduce future impacts to the mountain yellow-legged frog and prevent further fragmentation of their habitat over the short and long-term.

Therefore, it is my determination that this alternative would have a "*Beneficial Impact*" on the mountain yellow-legged frog.

Alternative 4
This alternative may result in minor amounts of human-caused mortality, may increase disturbance to some individuals, and would result in minor amounts of habitat modification within the project area, but these effects would be limited over the long-term since cross-country travel would be prohibited. Since the direct effects would be limited to only some individuals and the indirect effects would impact only a small percentage of occupied and suitable habitat, this alternative would not likely result in any impacts to MYLF populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the mountain yellow-legged frog.

Alternative 5
This alternative may result in minor amounts of human-caused mortality, may increase disturbance to some individuals, and would result in minor amounts of habitat modification within the project area, but these effects would be limited over the long-term since cross-country travel

would be prohibited. Since the direct effects would be limited to only some individuals and the indirect effects would impact only a small percentage of occupied and suitable habitat, this alternative would not likely result in any impacts to MYLF populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the mountain yellow-legged frog.

Western Pond Turtle
Clemmys marmorata

Species and Habitat Account

The western pond turtle (WPT) is the only extant aquatic turtle native to California and ranges from Washington to southern California (Stebbins 1985, Reese and Welsh 1997). They have been found throughout lower elevations of the STF, but are primarily located on the southern portions of the project area at elevations <4,500 feet (Aquasurv 2008). While herpetofauna surveys have occurred extensively throughout the STF, but surveys have not been conducted systematically as part of this project nor have they covered aquatic habitat within the project area in entirety. Approximately 20% of all perennial streams, 6% of all seasonal streams, and approximately 20% of all lakes and ponds have been surveyed. Results from these surveys and various other sources indicate that pond turtles have been observed at more than 20 locations throughout the STF.

Western pond turtles are habitat generalists, occurring in a wide variety of permanent and intermittent aquatic habitats and by using terrestrial habitats extensively. Although they may occur up to 6,000 feet in elevation, they have rarely been observed above 5,000 feet within the project area (Stebbins 1972, Aquasurv 2008). Individual western pond turtles (usually males) may have large home ranges and may wander within a given watercourse for several kilometers on a regular basis (Holland 1994, Reese and Welsh 1997). In streams, Reese (1996) found that all turtles in the study used terrestrial habitats during the course of the year. Terrestrial habitats are needed for nesting, overwintering, and for seasonal uses. Western pond turtle nests have been found as far as 435 yards from the stream (Reese and Welsh 1997) in open sunny areas on hillslopes, generally with a south to southwest facing aspect. Nest sites typically occur in open areas dominated by grasses or herbaceous annuals on dry, well-drained soils with high clay/silt content and low (less than 15 degree) slope (Holland 1994). There is some indication that most nesting excursions occur at night (Rathbun et al. 2002). Western pond turtles also move into upland slopes while overwintering or during periods when aquatic habitats become unsuitable (dry). Overwintering can occur The timing of overwintering movements is poorly understood, but generally occur within the project area from the fall (October) to early spring (April).

For the purposes of this analysis, suitable western pond turtle aquatic habitat has been defined and mapped as continuous (minimum of 200 feet) perennial and intermittent streams with less than 6% gradient and all lentic habitats below 5,000 feet in elevation. Since systematic surveys for the project were not conducted for pond turtles in all potentially suitable aquatic habitat, occupied aquatic habitat was conservatively estimated. These estimates were determined using the most current recorded sightings of pond turtles. Since locations of pond turtles were often associated with a specific point on land, all adjacent potentially suitable aquatic habitats were assumed occupied. Suitable stream habitat was assumed occupied upstream and downstream of the sighting until a reach of unsuitable (> 6% gradient) stream habitat greater than 400 meters was encountered. Further, this analysis assumes that all land within 400 meters of suitable aquatic habitat may provide suitable nesting habitat. Although pond turtles may travel further than 400 meters from aquatic habitat for overwintering purposes, these movements appear to be far less frequent. Since nesting primarily occurs within 400 meters of aquatic habitat, potential for impacts beyond 400 meters of suitable aquatic habitat is very low and would likely result in

negligible effects to the species (Storer 1930, Holland 1994, Rathbun et al. 1992, Reese 1996, Reese and Welsh 1997, Rathbun et al. 2002).

Management Direction

The western pond turtle was identified by the Regional Forester as a Sensitive Species on the STF (USDA 2007a). The Forest Plan Direction contains the following management direction associated with the proposed project for the western pond turtle:

- In areas adjacent to waters with known populations of western pond turtle:
    - Construct new roads or trails or use existing off-road routes for motorized vehicles only if at least ¼ mile from occupied habitat or where approved by a Wildlife Biologist.

Direct & Indirect Effects

General – All Alternatives

The project alternatives could result in direct and indirect effects to the western pond turtle by:

- Prohibiting cross-country travel off of the NFTS,
- Adding facilities to the NFTS,
- Changing the type of use on NFTS routes,
- Changing the season of use on NFTS routes,
- Implementing mitigation measures.

These actions may have direct and indirect effects on pond turtles through: human-caused mortality, changes in behavior, and habitat modification (see Effects Common to all Aquatic Wildlife). Furthermore, pond turtles may be more or less prone to motorized travel management because essentially all individuals use terrestrial habitats extensively throughout the year and they are wary of human presence. During nesting excursions, females are very sensitive to disturbance and will abandon the nesting effort (Reese 1996, Rathbun et al. 2002). The WPT also uses upland habitats extensively as overwintering habitat (Holland 1994, Rathbun et al. 2002), a period of reduced activity partially in response to cold weather and limited availability of food resources.

Indicators

Based upon the available literature, the following indicators were chosen to provide a relative measure of the direct and indirect effects to the western pond turtle. Although biological thresholds for these indicators have not been established, they provide general measures by which the effects of the project alternatives may be compared.

- Number of stream crossings on routes added to the NFTS within known occupied habitat.
- Number of stream crossings on ML1 roads converted to trails within known occupied aquatic habitat.
- Miles of routes added to the NFTS within 400 meters of known occupied aquatic habitat.
- Miles of ML1 roads converted to trails within 400 meters of known occupied habitat
- Number of stream crossings (perennial and intermittent) on routes added to the NFTS within suitable aquatic habitat.
- Number of stream crossings on ML1 roads converted to trails within suitable aquatic habitat.
- Miles of routes added to the NFTS within 400 meters of suitable aquatic habitat.
- Miles of ML1 roads converted to trails within 400 meters of suitable aquatic habitat.

Alternative 1

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 occupied and suitable western pond turtle habitat. This would reduce the risk of direct and indirect effects to these frogs from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 1, several analyses were completed (Table 38). This alternative would result in the addition of several routes and 22 stream crossings within occupied western pond turtle habitat and several routes with 38 stream crossings within suitable habitat. These routes and stream crossings would likely result in direct and indirect effects to some juvenile and adult individual western pond turtles. The addition of routes and conversion of roads to trails within 400 meters of occupied and suitable aquatic habitat may result in direct effects to adults (females) moving overland to find suitable nesting locations. Since nests are prepared in terrestrial habitat with vegetation providing some cover, it is unlikely that nests would be built directly in routes. Therefore, motorized use on routes would not likely result in the destruction of pond turtle nests. In areas where routes intersect suitable nesting habitat, hatchlings may be disturbed or crushed as they leave the nest to find suitable aquatic habitat.

The addition of routes and conversion of ML1 roads to trails would result in indirect effects to both aquatic and terrestrial habitat over the short and long-term. Indirect effects that are likely to occur to suitable and occupied habitat include: the loss of suitable nesting habitat and increased sedimentation into streams. Since these impacts would affect a very small percentage of suitable and occupied habitat, these actions would likely impact some individuals but would not likely result in impacts to populations within the project area over the short or long-term.

Season of Use: Western pond turtles generally move into upland terrestrial habitat to overwinter. Most of the occupied and suitable pond turtle habitat in the project area is within Zone 2 or Zone 3 of the seasonal closures (as identified for each route in Appendix I of the STF Travel Management DEIS). Limiting the season of use would likely reduce disturbance to some individual overwintering pond turtles. Furthermore, the closure of routes during the wet weather season reduces soil perturbation and sedimentation into streams associated with all life history stages of the western pond turtle.

Mitigation Measures: Types of mitigation measures proposed on routes associated with occupied pond turtle habitat include: barriers, tread hardening, and drain dips. Types of mitigation measures proposed on routes associated with suitable pond turtle habitat include: barriers, tread hardening, drain dips, hardened stream crossings, water bars, a cattle guard, and a small bridge. The installation of hardened stream crossings and a small bridge would likely result in a short-term increase in sedimentation which may impact some individuals. The installation of all mitigation measures may result in short-term disturbance to some individual pond turtles, but will limit trail widening, reduce soil perturbation, and reduce sedimentation, providing beneficial effects over the long-term.

Table 38. Western Pond Turtle: Direct and Indirect Effects Indicators - Alternative 1

Alternative 1 - Western Pond Turtle - Direct and Indirect Effects Indicators	
Number of stream crossings on routes added to the NFTS within known occupied aquatic habitat	22
Number of stream crossings on ML1 roads converted to trails within known occupied aquatic habitat	0
Miles of routes added to the NFTS within 400 meters of known occupied aquatic habitat	8.21
Miles of ML1 roads converted to trails within 400 meters of known occupied habitat	6.95
Percentage of upland habitat (within 400 meters of occupied aquatic habitat) directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%
Number of stream crossings on routes added to the NFTS within suitable aquatic habitat	34

Number of stream crossings on ML1 roads converted to trails within suitable aquatic habitat	4
Miles of routes added to the NFTS within 400 meters of suitable aquatic habitat	34.1
Miles of ML1 roads converted to trails within 400 meters of suitable aquatic habitat	30.12
Percentage of upland habitat (within 400 meters of suitable aquatic habitat) directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%

Alternative 2
Cross-Country Travel: Cross-country travel would not be prohibited under this alternative. Therefore it is assumed that route proliferation would continue over the short and long-term and the effects would be similar to those discussed below for adding routes to the NFTS.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: Although this alternative would not result in the addition of any miles of unauthorized routes to the NFTS, vehicles would be allowed to use all existing motorized trails because cross-country travel would be allowed. Therefore, it is assumed that wheeled motorized vehicles will continue to use all of the documented unauthorized routes previously identified and continue to create new routes. The use of these routes and the continued proliferation of new routes would result in increasing amounts of direct and indirect effects to pond turtles. These effects would be similar to those discussed within Alternative 4 for the short-term, but would be exacerbated over the long-term by the continued proliferation of routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would reduce potential disturbance to pond turtles.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 3
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 occupied and suitable western pond turtle habitat. This would reduce the risk of direct and indirect effects to these frogs from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: This alternative would not result in the addition of any motorized routes to the NFTS, nor would it change the type of use on any current NFTS routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would reduce potential direct and indirect effects to the western pond turtle.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 4
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 occupied and suitable western pond turtle habitat. This would reduce the risk of direct and indirect effects to these frogs from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 4, several analyses were completed (Table 39). Direct and indirect effects of the actions proposed in this alternative would be similar to those discussed in Alternative 1. Since there is an increase from Alternative 1 in the number of routes added to the system or converted to a trail within occupied and suitable pond turtle habitat, there would be an increase in the direct and indirect effects to individuals within the project area. Although these increases would result in more individuals being impacted, these increases would not likely be significant enough to result in impacts to FYLF populations within the project area.

Season of Use: Western pond turtles generally move into upland terrestrial habitat to overwinter. Most of the occupied and suitable pond turtle habitat in the project area is within Zone 2 or Zone 3 of the seasonal closures (as identified for each route in Appendix I of the STF Travel Management DEIS). Limiting the season of use would likely reduce disturbance to some individual overwintering pond turtles. Furthermore, the closure of routes during the wet weather season reduces soil perturbation and sedimentation into streams associated with all life history stages of the western pond turtle.

Mitigation Measures: The effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 39. Western Pond Turtle: Direct and Indirect Effects Indicators - Alternative 4

Alternative 4 - Western Pond Turtle - Direct and Indirect Effects Indicators	
Number of stream crossings on routes added to the NFTS within known occupied aquatic habitat	22
Number of stream crossings on ML1 roads converted to trails within known occupied aquatic habitat	4
Miles of routes added to the NFTS within 400 meters of known occupied aquatic habitat	8.6
Miles of ML1 roads converted to trails within 400 meters of known occupied habitat	15.49
Percentage of upland habitat (within 400 meters of occupied aquatic habitat) directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%
Number of stream crossings on routes added to the NFTS within suitable aquatic habitat	34
Number of stream crossings on ML1 roads converted to trails within suitable aquatic habitat	13
Miles of routes added to the NFTS within 400 meters of suitable aquatic habitat	39.91
Miles of ML1 roads converted to trails within 400 meters of suitable aquatic habitat	43.99
Percentage of upland habitat (within 400 meters of suitable aquatic habitat) directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%

Alternative 5

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 occupied and suitable western pond turtle habitat. This would reduce the risk of direct and indirect effects to these frogs from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 5, several analyses were completed (Table 40). Direct and indirect effects of the actions proposed in this alternative would be similar to those discussed in Alternative 1. Since there is a significant decrease from Alternative 1 in the number of routes added to the system or converted to a trail within suitable and occupied pond turtle habitat, there would be a significant decrease in the direct and indirect effects to individuals within the project area. Since these impacts would affect a very small percentage of suitable and occupied habitat (Table 40), these actions would likely impact some individuals but would not likely result in impacts to populations within the project area over the short or long-term.

Season of Use: Western pond turtles generally move into upland terrestrial habitat to overwinter. Most of the occupied and suitable pond turtle habitat in the project area is within Zone 2 or Zone 3 of the seasonal closures (as identified for each route in Appendix I of the STF Travel Management DEIS). Limiting the season of use would likely reduce disturbance to some individual overwintering pond turtles. Furthermore, the closure of routes during the wet weather season reduces soil perturbation and sedimentation into streams associated with all life history stages of the western pond turtle.

Mitigation Measures: The effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 40. Western Pond Turtle: Direct and Indirect Effects Indicators - Alternative 5

Alternative 5 - Western Pond Turtle - Direct and Indirect Effects Indicators	
Number of stream crossings on routes added to the NFTS within known occupied aquatic habitat	0
Number of stream crossings on ML1 roads converted to trails within known occupied aquatic habitat	0
Miles of routes added to the NFTS within 400 meters of known occupied aquatic habitat	0
Miles of ML1 roads converted to trails within 400 meters of known occupied habitat	0.36
Percentage of upland habitat (within 400 meters of occupied aquatic habitat) directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%
Number of stream crossings on routes added to the NFTS within suitable aquatic habitat	2
Number of stream crossings on ML1 roads converted to trails within suitable aquatic habitat	1
Miles of routes added to the NFTS within 400 meters of suitable aquatic habitat	5.94
Miles of ML1 roads converted to trails within 400 meters of suitable aquatic habitat	2.06
Percentage of upland habitat (within 400 meters of suitable aquatic habitat) directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%

Cumulative Effects

Like the amphibians discussed above, the western pond turtle has experienced dramatic declines within its range. The Federal Register (57 FR 45761) listed habitat destruction as the primary cause for the decline of the species. Within the analysis area, livestock grazing, suction dredge mining, water developments, and vegetation management activities have impacted or have the potential to result in impacts to individuals or modification of habitat.

Grazing has the potential to affect the western pond turtle. Livestock may incur injury or mortality to individuals through trampling, particularly hatchlings in the nest or in shallow water habitats. Sediment arising from areas of high use by livestock may impact pool habitat (reduction in volume). Grazing likely does not have a major influence on upland habitat attributes, such as vegetation composition or availability of overwintering sites. When livestock access water, there is the potential that their presence will result in a physical disturbance to individual turtles and cause them to seek refuge in aquatic habitat. The consequence of this disturbance is likely very minor in that it may interrupt an activity like basking that is necessary for basic metabolism. Basking is tied to metabolism which is linked with food intake and growth. If the interruptions are occasional, then the effect on metabolism is likely to be negligible. Extended disturbance may result in dispersal from the affected area or in loss of body mass (Cadi and Joly 2003). Nine active allotments overlap known populations of WPT and six other allotments overlap suitable habitat. Historic grazing likely had a minor impact on individuals and habitats, while current livestock grazing has minor impact on individuals and habitats.

Suction dredge mining can result in disturbance to individuals and modification of habitat. The presence of people operating dredges in occupied habitat can cause physical disturbance to individuals, thereby interrupting their normal activity pattern. As noted above, if the disturbance is occasional then the effect on metabolism is assumed to be negligible; however, if the disturbance is excessive then physiological effects on growth is expected. Dredging can also alter habitats, possibly favoring the turtle. On the STF, observations have indicated that pool habitats are frequently deepened by dredging and WPT take advantage of this “improved” pool habitat. It is unlikely that dredgers unintentionally suck turtles into the dredge because they are relatively conspicuous and typically attempt to avoid capture. The impact of past and current suction dredging is minor to individuals and negligible to the aquatic habitats needed by the species.

Water developments have the potential to impact the WPT through loss and/or modification of habitat. As noted above, several impoundments have been constructed on rivers across the STF resulting in a direct loss of habitat. Holland (1994) found that large impoundments are largely unsuitable for the WPT. Indirect impacts to habitat include loss of habitat complexity and alterations in water temperatures. Reese and Welsh (1998) investigated the impacts of regulated streamflow downstream of an impoundment and found that habitat suitability was reduced in a dammed stream because there were fewer slow-velocity and warm water habitats than in an undimmed stream. The implication of reduced habitat suitability was more time spent basking for thermoregulation which increased predation risk (Reese and Welsh 1998). Dams also physically interrupt the continuity of aquatic habitats which can effectively separate populations of turtles and limit genetic dispersal. The impact of past and current water developments on the STF have had, and continue to have, moderate to major impacts on the western pond turtle and its habitats.

Vegetation management activities have the potential to impact individuals and the habitats required by the WPT. Since the turtle uses upland habitats extensively, there is the potential that timber harvest, fuel reduction activities, and prescribed fire can impact individuals directly. Mechanical operations (harvest, shredding) and prescribed fire frequently occur within 100 meters of occupied streams. These activities can injure or kill individual females attempting to nest, overwintering, or by impacting nests (eggs and hatchlings). Fuel reduction and prescribed fire have the potential to modify upland and riparian habitats directly by changing the composition and density of vegetation in upland habitats. There may be detrimental and beneficial effects associated with loss of leaf duff/overwintering habitat and increased nesting habitat, respectively. Typically, the amount of sediment arising from vegetation management projects is minor and only has small and localized impacts to aquatic habitat (reduced pool volume). There are 10 to 15 projects that are planned or in the planning phase on the STF that could affect WPT habitats. Additional vegetation management projects have and will occur on private timber lands within the analyzed landscape. Past activities likely had a greater impact (moderate) on the WPT because protections have only occurred in the last 10 years and management activities occurred close to streams. At present, mitigation measures are incorporated to minimize effects at occupied sites and the current level of impact is minor on the turtle.

Determinations

Alternative 1

This alternative may result in minor amounts of human-caused mortality, would likely increase disturbance to some individuals, and would result in minor amounts of habitat modification within the project area, but these effects would be limited over the long-term since cross-country travel would be prohibited. Since the direct effects would be limited to only some individuals and the indirect effects would impact only a small percentage of occupied and suitable habitat, this alternative would not likely result in any impacts to western pond turtle populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the western pond turtle.

Alternative 2

Although this alternative would result in increased amounts of human-caused mortality, disturbance, and habitat fragmentation within the project area, continued route proliferation within and near occupied and suitable habitat would be limited by topography and vegetation. These direct and indirect effects would likely result in adverse impacts to some individuals over short and long-term. Since route proliferation near suitable and occupied habitat would be limited over the long-term by topography and vegetation these impacts would not likely result in measurable impacts to populations within the project area.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the western pond turtle.

Alternative 3

Cross-country travel would be prohibited and there would not be any motorized routes added to the NFTS in this alternative. Prohibiting cross-country travel would reduce future impacts to the western pond turtle and prevent further fragmentation of their habitat over the short and long-term.

Therefore, it is my determination that this alternative would have a "*Beneficial Impact*" on the western pond turtle.

Alternative 4

This alternative may result in minor amounts of human-caused mortality, would likely increase disturbance to some individuals, and would result in minor amounts of habitat modification within the project area, but these effects would be limited over the long-term since cross-country travel would be prohibited. Since the direct effects would be limited to only some individuals and the indirect effects would impact only a small percentage of occupied and suitable habitat, this alternative would not likely result in any impacts to western pond turtle populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the western pond turtle.

Alternative 5

This alternative may result in minor amounts of human-caused mortality, would likely increase disturbance to some individuals, and would result in minor amounts of habitat modification within the project area, but these effects would be limited over the long-term since cross-country travel would be prohibited. Since the direct effects would be limited to only some individuals and the indirect effects would impact only a small percentage of occupied and suitable habitat, this

alternative would not likely result in any impacts to western pond turtle populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the western pond turtle.

Yosemite Toad
Bufo canorus

Species and Habitat Account

The Yosemite toad is an endemic species to the state of California and is found at high elevations in the Sierra Nevada Mountains. Although they occur in habitats that are less impacted by humans, they currently only occupy approximately 50% of their historic range (Lannoo 2005). Herpetofauna surveys have occurred throughout the STF, but surveys have not been conducted systematically for this project nor have they covered Yosemite toad habitat within the project area in entirety. Approximately 55% of all wet meadows within the range of the toad have been surveyed. Results from these surveys and various other sources indicate that these toads have been observed at approximately 65-70 locations throughout the STF.

The Yosemite toad inhabits high elevation meadows that are typically associated with a water source and a willow component. Upon snowmelt, the toad moves from a hibernaculum to a breeding site typically located in a meadow. Shallow water sheeting across/through vegetation appears to be favored for breeding because water temperatures are very warm and allow for rapid development of the eggs and tadpoles. However, tadpoles have been observed in small streams in wet meadows. Females may breed once every two to three years. Following breeding, the adults move into the rest of the meadow, willow thickets, and the uplands surrounding the meadow to forage (Kagarise Sherman and Morton 1984, Martin 2008). Dispersal distance from the breeding site to foraging habitat is variable, but Martin (2008) reports movements exceeding 600 meters are possible. At the end of the season, toads seek underground refugia (ex. rodent burrows) to overwinter. Morton (1981) reported toads may overwinter up to 750 meters from the nearest breeding site. Kagarise Sherman and Morton (1984) reported a majority of activity occurred during the day; however, Martin (2008) reported most longer distance movements occurred at night. Although the elevation range of the species begins at approximately 6,400 feet, they have only been found within the project area above 7,200 feet. For the purposes of this analysis, potentially suitable Yosemite toad habitat has been defined and mapped as the Wet Willow and Wet Other CWHR types above 7,000 feet in elevation.

Management Direction

The Yosemite toad was identified by the Regional Forester as a Sensitive Species on the STF (USDA 2007a). The Forest Plan Direction does not provide any specific management direction related to this project for the Yosemite toad.

Direct & Indirect Effects

General – All Alternatives

The project alternatives could result in direct and indirect effects to the Yosemite toad by:

- Prohibiting cross-country travel off of the NFTS,
- Adding facilities to the NFTS,
- Changing the type of use on NFTS routes,
- Changing the season of use on NFTS routes,
- Implementing mitigation measures.

These actions may have direct and indirect effects on toads through: human-caused mortality, changes in behavior, and habitat modification (see Effects Common to all Aquatic Wildlife).

Furthermore, pond turtles may be more or less prone to motorized travel management because breeding movements typically occur when roads near breeding sites are impassable due to snow, trails/roads are not located within meadows, and because most post-breeding movements occur in the breeding meadow or upland habitats adjacent to the breeding meadow. However, the dispersal and overwintering movements are large (exceeding 600 meters) making it possible that toads may have to cross roads to reach preferred foraging or overwintering sites.

Indicators
Based upon the available literature, the following indicators were chosen to provide a relative measure of the direct and indirect effects to the Yosemite toad. Although biological thresholds for these indicators have not been established, they provide general measures by which the effects of the project alternatives may be compared.

- Number of stream crossings on routes added to the NFTS within known occupied habitat.
- Number of stream crossings on ML1 roads converted to trails within known occupied habitat.
- Miles of routes added to the NFTS within known occupied habitat.
- Miles of ML1 roads converted to trails within known occupied habitat.
- Percentage of occupied habitat directly impacted by routes added to the NFTS or ML1 roads converted to trails.
- Miles of routes added to the NFTS within 100 meters of known occupied habitat.
- Miles of ML1 roads converted to trails within 100 meters of known occupied habitat.
- Miles of routes added to the NFTS within 400 meters of known occupied habitat.
- Miles of ML1 roads converted to trails within 400 meters of known occupied habitat.
- Number of stream crossings on routes added to the NFTS within known suitable habitat.
- Number of stream crossings on ML1 roads converted to trails within known suitable habitat.
- Miles of routes added to the NFTS within potentially suitable habitat.
- Miles of ML1 roads converted to trails within potentially suitable habitat.
- Percentage of suitable habitat directly impacted by routes added to the NFTS or ML1 roads converted to trails.

Alternative 1
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 occupied and suitable Yosemite toad. This would reduce the risk of direct and indirect effects to these frogs from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 1, several analyses were completed (Table 41). This alternative would result in the addition of zero stream crossings in occupied habitat and three stream crossings within suitable habitat. These stream crossings may result in direct and indirect effects to some individuals of all Yosemite toad life history stages. Routes being added to the system within or near occupied and suitable Yosemite toad habitat may result in direct effects to some juveniles and adults and indirect effects to all life history stages of this toad. Since these impacts would affect a very small percentage of suitable and occupied habitat, these actions would likely impact some individuals but would not likely result in impacts to populations within the project area over the short or long-term.

Season of Use: The Yosemite toad inhabits higher elevations and spends the cold winter months in torpor. All occupied and suitable Yosemite toad habitat would be within Zone 2 and Zone 3 of the seasonal closures (as identified for each route in Appendix I of the STF Travel Management DEIS). Since these frogs typically overwinter in earthen cavities (rodent burrows, rock crevices) the use of wheeled motor vehicles during the winter months would have very little impact on them. Although impacts are expected to be minimal during the winter, these closures may

provide some additional protection prior to these toads entering torpor in fall and after emergence in the spring. Furthermore, the closure of routes during the wet weather season reduces soil perturbation and sedimentation into streams associated with all life history stages of the Yosemite toad.

Mitigation Measures: The only type of mitigation measure proposed on routes that are associated with occupied Yosemite toad habitat is a drain dip. Types of mitigation measures proposed on routes associated with suitable Yosemite toad habitat include barriers and drain dips. The installation of all mitigation measures may result in short-term disturbance to some individual toads, but will limit trail widening, reduce soil perturbation, and reduce sedimentation, providing beneficial effects over the long-term.

Table 41. Yosemite Toad: Direct and Indirect Effects Indicators - Alternative 1

Alternative 1 - Yosemite Toad - Direct and Indirect Effects Indicators	
Number of stream crossings on routes added to the NFTS within known occupied habitat	0
Number of stream crossings on ML1 roads converted to trails within known occupied habitat	0
Miles of routes added to the NFTS within known occupied habitat	0.19
Miles of ML1 roads converted to trails within known occupied habitat	0
Percentage of occupied habitat directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%
Miles of routes added to the NFTS within 100 meters of known occupied habitat	0.3
Miles of ML1 roads converted to trails within 100 meters of known occupied habitat	0
Miles of routes added to the NFTS within 400 meters of known occupied habitat	0.3
Miles of ML1 roads converted to trails within 400 meters of known occupied habitat	0
Number of stream crossings on routes added to the NFTS within potentially suitable habitat	0
Number of stream crossings on ML1 roads converted to trails within potentially suitable habitat	3
Miles of routes added to the NFTS within potentially suitable habitat	0.14
Miles of ML1 roads converted to trails within potentially suitable habitat	0.1
Percentage of suitable habitat directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%

Alternative 2

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

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: Although this alternative would not result in the addition of any miles of unauthorized routes to the NFTS, vehicles would be allowed to use all existing motorized trails because cross-country travel would

be allowed. Therefore, it is assumed that wheeled motorized vehicles will continue to use all of the documented unauthorized routes previously identified and continue to create new routes. The use of these routes and the continued proliferation of new routes would result in increasing amounts of direct and indirect effects to these toads. These effects would be similar to those discussed within Alternative 4 for the short-term, but would be exacerbated over the long-term by the continued proliferation of routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would reduce potential disturbance to these toads.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 3

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 occupied and suitable Yosemite toad. This would reduce the risk of direct and indirect effects to these frogs from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: This alternative would not result in the addition of any motorized routes to the NFTS, nor would it change the type of use on any current NFTS routes.

Season of Use: Seasonal closures that would be implemented under this alternative are only those that currently exist. Although they would be limited, the seasonal closures implemented within this alternative would reduce potential direct and indirect effects to the Yosemite toad.

Mitigation Measures: There would not be any mitigation measures implemented as part of this alternative.

Alternative 4

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 occupied and suitable Yosemite toad. This would reduce the risk of direct and indirect effects to these frogs from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 4, several analyses were completed (Table 42). Direct and indirect effects of the actions proposed in this alternative would be the same as those discussed in Alternative 1.

Season of Use: The Yosemite toad inhabits higher elevations and spends the cold winter months in torpor. All occupied and suitable Yosemite toad habitat would be within Zone 2 and Zone 3 of the seasonal closures (as identified for each route in Appendix I of the STF Travel Management DEIS). Since these frogs typically overwinter in earthen cavities (rodent burrows, rock crevices) the use of wheeled motor vehicles during the winter months would have very little impact on them. Although impacts are expected to be minimal during the winter, these closures may provide some additional protection prior to these toads entering torpor in fall and after emergence in the spring. Furthermore, the closure of routes during the wet weather season reduces soil perturbation and sedimentation into streams associated with all life history stages of the Yosemite toad.

Mitigation Measures: The effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 42. Yosemite Toad: Direct and Indirect Effects Indicators - Alternative 4

Alternative 4 - Yosemite Toad - Direct and Indirect Effects Indicators	
Number of stream crossings on routes added to the NFTS within known occupied habitat	0
Number of stream crossings on ML1 roads converted to trails within known occupied habitat	0
Miles of routes added to the NFTS within known occupied habitat	0.19
Miles of ML1 roads converted to trails within known occupied habitat	0
Percentage of occupied habitat directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%
Miles of routes added to the NFTS within 100 meters of known occupied habitat	0.3
Miles of ML1 roads converted to trails within 100 meters of known occupied habitat	0
Miles of routes added to the NFTS within 400 meters of known occupied habitat	0.3
Miles of ML1 roads converted to trails within 400 meters of known occupied habitat	0
Number of stream crossings on routes added to the NFTS within potentially suitable habitat	0
Number of stream crossings on ML1 roads converted to trails within potentially suitable habitat	3
Miles of routes added to the NFTS within potentially suitable habitat	0.14
Miles of ML1 roads converted to trails within potentially suitable habitat	0.1
Percentage of suitable habitat directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%

Alternative 5

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 occupied and suitable Yosemite toad. This would reduce the risk of direct and indirect effects to these frogs from motorized travel over the short and long-term.

Adding Routes to the NFTS or Changing the Type of Use on Current NFTS Routes: To determine the relative risk of the direct and indirect effects of Alternative 5, several analyses were completed (Table 43). Direct and indirect effects of the actions proposed in this alternative would be similar to those discussed in Alternative 1. Since there is a slight decrease from Alternative 1 in the amount of routes added to the system or converted to a trail within suitable habitat, there would likely be a slight decrease in the direct and indirect effects to individuals within the project area. Since these impacts would affect a very small percentage of suitable and occupied habitat (Table 43), these actions would likely impact some individuals but would not likely result in impacts to populations within the project area over the short or long-term.

Season of Use: The Yosemite toad inhabits higher elevations and spends the cold winter months in torpor. All occupied and suitable Yosemite toad habitat would be within Zone 2 and Zone 3 of the seasonal closures (as identified for each route in Appendix I of the STF Travel Management DEIS). Since these frogs typically overwinter in earthen cavities (rodent burrows, rock crevices)

the use of wheeled motor vehicles during the winter months would have very little impact on them. Although impacts are expected to be minimal during the winter, these closures may provide some additional protection prior to these toads entering torpor in fall and after emergence in the spring. Furthermore, the closure of routes during the wet weather season reduces soil perturbation and sedimentation into streams associated with all life history stages of the Yosemite toad.

Mitigation Measures: The effects of mitigation measures in this alternative would be similar to those discussed for Alternative 1.

Table 43. Yosemite Toad: Direct and Indirect Effects Indicators - Alternative 5

Alternative 5 - Yosemite Toad - Direct and Indirect Effects Indicators	
Number of stream crossings on routes added to the NFTS within known occupied habitat	0
Number of stream crossings on ML1 roads converted to trails within known occupied habitat	0
Miles of routes added to the NFTS within known occupied habitat	0.19
Miles of ML1 roads converted to trails within known occupied habitat	0
Percentage of occupied habitat directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%
Miles of routes added to the NFTS within 100 meters of known occupied habitat	0.3
Miles of ML1 roads converted to trails within 100 meters of known occupied habitat	0
Miles of routes added to the NFTS within 400 meters of known occupied habitat	0.3
Miles of ML1 roads converted to trails within 400 meters of known occupied habitat	0
Number of stream crossings on routes added to the NFTS within potentially suitable habitat	0
Number of stream crossings on ML1 roads converted to trails within potentially suitable habitat	3
Miles of routes added to the NFTS within potentially suitable habitat	0.03
Miles of ML1 roads converted to trails within potentially suitable habitat	0.1
Percentage of suitable habitat directly impacted by routes added to the NFTS or ML1 roads converted to trails	<1%

Cumulative Effects

While the causes of decline for Yosemite toad are unclear, several past and current stressors have contributed to the decline in Yosemite toad numbers and distribution. The decline of the Yosemite toad has largely been hypothesized to include factors such as livestock grazing, disease, and pesticide drift.

Martin (2008) associated declines in Yosemite toad populations primarily to livestock grazing. Beginning in the 1860's, high elevation meadows were heavily impacted by unrestricted, large numbers of sheep. Cattle were introduced in the early 1900's and large numbers were allowed unrestricted access to the high elevation meadows that provide suitable habitat for the toad. Primary impacts to individuals include the trampling of tadpoles in breeding habitat, adults and

subadults in upland habitats, and recent metamorphs who have limited mobility. Impacts to habitat may have been more severe, with many meadows losing hydrologic function when streams incised and widened, thereby preventing annual flood waters from inundating the meadow and lowering the water table. Lowered water tables may be important in the persistence of breeding habitat (early desiccation), which is naturally vulnerable in a Mediterranean climate. Livestock have the tendency to linger in the wet habitats in late summer because these habitats frequently support palatable forage. As such, breeding habitats tend to be heavily trampled and pocked by hooves. Livestock also graze the vegetation that may be important to toads for cover, foraging, and creating a cool, moist microclimate at the ground surface. There is also some speculation that the metabolic waste products degrade breeding habitats occupied by tadpoles through exposure to nitrogen (nitrates, nitrites, ammonium) and phosphorus compounds. On the STF, livestock allotments overlap a majority of the occupied Yosemite toad habitat. Approximately 45% of the known occupied sites occur outside of livestock allotments, primarily in the Emigrant Wilderness area. Historic livestock grazing likely had major impacts to individuals and habitat. Current impacts are considered to be moderate, since livestock numbers have steadily declined over the last 80 years and because restrictions on utilization and the timing of grazing have been recently implemented.

Kagarise Sherman and Morton (1993) documented declines of Yosemite toad populations in and near Yosemite National Park. Using pathological examinations of toads collected during this die-off, Green and Kagarise Sherman (2001) indicated disease may have been critical in the declines of Yosemite toad populations within protected areas. Several diseases and parasites were detected in preserved specimens, including the chytrid fungus (Batrachochytrium dendrobatidis) suspected in many amphibian die offs (Berger et al. 1998, Lips 1998, Fellers et al. 2001, Daszak et al. 2003). This fungus is apparently widespread and has the potential to affect every population of Yosemite toad on the STF. While the past and present impact of disease on Yosemite toad populations is unknown, it is assumed that diseases (in general) and chytridiomycosis (in specific) have a major potential to impact the remaining populations on the STF.

Davidson et al. (2002) used spatial tests to determine that windborne contaminants were consistent with Yosemite toad declines because at historic sites where Yosemite toads were absent had twice as much agricultural land upwind compared to historic sites that still have toads. Fellers et al. (2004) found elevated levels of DDE and other organochlorines in frog tissues in an area upwind of extensive agriculture. Fellers et al. (2007) and Davidson and Knapp (2007) both suggest airborne agrochemical deposition in the Sierra Nevada are contributing to declines of amphibians in relatively undisturbed environments. It is not known how pesticide contamination has affected the Yosemite toad on the STF in the past or currently. It is assumed that airborne contaminants are having a minor to moderate effect on Yosemite toad populations and habitat.

Determinations

Alternative 1

This alternative may result in minor amounts of human-caused mortality, would likely increase disturbance to some individuals, and would result in minor amounts of habitat modification within the project area, but these effects would be limited over the long-term since cross-country travel would be prohibited. Since the direct effects would be limited to only some individuals and the indirect effects would impact only a small percentage of occupied and suitable habitat, this alternative would not likely result in any impacts to Yosemite toad populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the Yosemite.

Alternative 2

Although this alternative would result in increased amounts of human-caused mortality, disturbance, and habitat fragmentation within the project area, continued route proliferation within and near occupied and suitable habitat would be limited by topography and wilderness areas. These direct and indirect effects would likely result in adverse impacts to some individuals over short and long-term. Since route proliferation near suitable and occupied habitat would be limited over the long-term by topography and wilderness areas these impacts would not likely result in measurable impacts to populations within the project area.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the Yosemite toad.

Alternative 3
Cross-country travel would be prohibited and there would not be any motorized routes added to the NFTS in this alternative. Prohibiting cross-country travel would reduce future impacts to the Yosemite toad and prevent further fragmentation of their habitat over the short and long-term.

Therefore, it is my determination that this alternative would have a "*Beneficial Impact*" on the Yosemite toad.

Alternative 4
This alternative may result in minor amounts of human-caused mortality, would likely increase disturbance to some individuals, and would result in minor amounts of habitat modification within the project area, but these effects would be limited over the long-term since cross-country travel would be prohibited. Since the direct effects would be limited to only some individuals and the indirect effects would impact only a small percentage of occupied and suitable habitat, this alternative would not likely result in any impacts to Yosemite toad populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the Yosemite.

Alternative 5
This alternative may result in minor amounts of human-caused mortality, would likely increase disturbance to some individuals, and would result in minor amounts of habitat modification within the project area, but these effects would be limited over the long-term since cross-country travel would be prohibited. Since the direct effects would be limited to only some individuals and the indirect effects would impact only a small percentage of occupied and suitable habitat, this alternative would not likely result in any impacts to Yosemite toad populations within the project area over the short or long-term.

Therefore, it is my determination that this alternative "*may impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species*" for the Yosemite.

Hell Hollow Slender Salamander
Hydromantes brunus

Species and Habitat Account

The Hell Hollow slender salamander is an endemic species to the state of California formerly assigned to the relictual slender salamander complex (Jockusch et al. 1998). Jockusch et al. (1998) report the distribution of the Hell Hollow slender salamander extends from the lower Merced River canyon (Mariposa County) to the American River canyon (Placer County) at elevations below 2,000 feet. Herpetofauna surveys have occurred throughout the STF, but

surveys have not been conducted systematically for this project nor have they covered Hell Hollow slender salamander habitat within the project area in entirety. Other occurrence records from near the STF boundary include the Stanislaus River canyon (Tuolumne County, now impounded by New Melones Reservoir), Table Mountain near Jamestown, California, and the Merced River canyon (Mariposa County).

Individual salamanders can be found under surface objects (rocks, logs, bark) during periods of high soil moisture (November to April). The primary vegetative communities in suitable habitat include mixed oak woodlands and areas of chaparral. The one occurrence record of the Hell Hollow slender salamander on the STF is from the North Fork Tuolumne River at the Riverside Day Use Area (Jockusch, personal communication).

Management Direction

The Hell Hollow slender salamander was identified by the Regional Forester as a Sensitive Species on the STF (USDA 2007a). The Forest Plan Direction does not provide any specific management direction related to this project for this salamander.

Direct & Indirect Effects

General – All Alternatives

The use of motorized routes is not known or suspected to have direct or indirect effects upon this species. The Hell Hollow slender salamander is terrestrial species that has a strong association with deep talus, surface cover objects, and a proclivity towards steep slopes (Gorman 1954). Since this type of terrain has very limited opportunity for cross-country travel there would be negligible impacts from motorized use. Furthermore, there would not be any routes added to the NFTS within Hell Hollow slender salamander habitat (below 2,000 feet) within the action alternatives and the lack of surface cover objects within the trail tread of designated routes would significantly reduce the risk of crushing to any individuals within any existing unauthorized routes.

Cumulative Effects

The lack of direct or indirect adverse effects of the project alternatives precludes them from having any cumulative effects to this species.

Determinations

It is my determination that the project alternatives would have *"No Impact"* on the Hell Hollow slender salamander.

Compliance with the Forest Plan and USFWS Management Guidelines and Project Design Criteria

American Marten

The American marten was identified by the Regional Forester as a Sensitive Species and Management Indicator Species (MIS) on the STF (USDA 2007a, USDA 2007b). The FSEIS amended the STF Forest Plan with updated guidelines for managing furbearers, including the marten (USDA 2004). The FSEIS removed the 1991 plan requirements for marten territories and the associated standards and guidelines.

Forest Plan Direction

1. Minimize old forest habitat fragmentation. Assess potential impacts of fragmentation on old forest associated species (particularly fisher and marten) in biological evaluations.
2. Mitigate impacts where there is documented evidence of disturbance to the den site from existing recreation, off highway vehicle route, trail, and road uses (including road

maintenance). Evaluate proposals for new roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb den sites.

Forest Plan Compliance

1. Alternative 2 would not prohibit cross-country travel; therefore, this alternative would not minimize old forest habitat fragmentation and would not comply with the above mentioned S&G. Alternatives 1, 3, 4, 5 would prohibit cross-country travel; therefore, they would minimize old forest habitat fragmentation and would comply with the above mentioned S&G.
2. There are no known marten den sites within the project area; therefore, all of the project alternatives would not have the potential to disturb den sites and would comply with the above mentioned S&G.

Pacific Fisher

The Pacific fisher was identified by the Regional Forester as a Sensitive Species on the STF (USDA 2007a). The FSEIS amended the STF Forest Plan with updated guidelines for managing furbearers, including the fisher (USDA 2004). The FSEIS removed the 1991 plan requirements for marten territories and the associated standards and guidelines.

Forest Plan Direction

1. Minimize old forest habitat fragmentation. Assess potential impacts of fragmentation on old forest associated species (particularly fisher and marten) in biological evaluations.
2. Mitigate impacts where there is documented evidence of disturbance to the den site from existing recreation, off highway vehicle route, trail, and road uses (including road maintenance). Evaluate proposals for new roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb den sites.

Forest Plan Compliance

1. Alternative 2 would not prohibit cross-country travel; therefore, this alternative would not minimize old forest habitat fragmentation and would not comply with the above mentioned S&G. Alternatives 1, 3, 4, 5 would prohibit cross-country travel; therefore, they would minimize old forest habitat fragmentation and would comply with the above mentioned S&G.
2. There are no known fisher den sites within the project area; therefore, all of the project alternatives would not have the potential to disturb den sites and would comply with the above mentioned S&G.

California Spotted Owl

The California spotted owl was identified by the Regional Forester as a Sensitive Species and Management Indicator Species (MIS) on the STF (USDA 2007a, USDA 2007b).

Forest Plan Direction

Mitigate impacts where there is documented evidence of disturbance to the nest site from existing recreation, off highway vehicle route, trail, and road uses (including road maintenance). Evaluate proposals for new roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb nest sites.

Forest Plan Compliance

The STF does not monitor spotted owl nest sites for disturbance from motorized recreation; therefore, there is not any documented disturbance to spotted owl nest sites from existing recreation.

Northern Goshawk

The northern goshawk was identified by the Regional Forester as a Sensitive Species on the STF (USDA 2007a).

Forest Plan Direction

Mitigate impacts where there is documented evidence of disturbance to the nest site from existing recreation, off highway vehicle route, trail, and road uses (including road maintenance). Evaluate proposals for new roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb nest sites.

Forest Plan Compliance

The STF does not monitor goshawk nest sites for disturbance from motorized recreation; therefore, there is not any documented disturbance to goshawk nest sites from existing recreation.

Bald Eagle

The bald eagle was listed by the U.S. Fish and Wildlife Service (USDI) as a federally endangered species in 1978 and was removed from the federal list of Threatened and Endangered Species on June 28, 2007. The bald eagle was identified by the Regional Forester as a Sensitive Species on the STF (USDA 2007a). Since 1978 populations have increased nationwide as well as in the Sierra Nevada (USDA 2001). Management direction for the bald eagle is now provided by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c) and the Migratory Bird Treaty Act (16 USC 703-712) of 1972. Under these acts, disturbance that is likely to cause injury, substantial interference with normal breeding, feeding or sheltering behavior, or nest abandonment is prohibited (USDI 2007).

USFWS Management Guidelines

1. Off-road vehicle use (including snowmobiles). No buffer is necessary around nest sites outside the breeding season. During the breeding season, do not operate off-road vehicles within 330 feet of the nest. In open areas, where there is increased visibility and exposure to noise, this distance should be extended to 660 feet.
2. Minimize potentially disruptive activities and development in the eagles' direct flight path between their nest and roost sites and important foraging areas.

USFWS Compliance

1. Alternative 2 would not prohibit cross-country travel; therefore, this alternative would not prevent disturbance to nest sites during the breeding season and would not comply with the above mentioned management guideline. Alternatives 1, 3, 4, 5 would prohibit cross-country travel and would not add any routes within 660 feet of nest sites; therefore, these alternatives would prevent disturbance to nest sites during the breeding season and would comply with the above mentioned management guideline.
2. Alternative 2 would not prohibit cross-country travel; therefore, this alternative would not "minimize potentially disruptive activities… between the eagles' nest and roost sites and important foraging areas" and would not comply with the above mentioned management guideline. Alternatives 1, 3, 4, 5 would prohibit cross-country travel and would not add any routes "between the eagles' nest and roost sites and important foraging areas"; therefore, these alternatives would comply with the above mentioned management guideline.

Forest Plan Direction

1. Within Designated Territories (delineated bald eagle management areas, or additional territories, based on nesting occupancy):

- Implement a Limited Operating Period (LOP) from January 1 through August 31.
- Apply LOP restriction to motor vehicle activities on level 1 roads and OHV routes open to the general public.
- Prohibit motor vehicle activity in wetlands, streamside management zones, and within 200 feet of lake shorelines that are used by bald eagles.

2. Outside Designated Territories (new active bald eagle nests outside of designated management territories):

    - From January 1 through August 31, implement the following restriction around the nest for a distance determined by the Wildlife Biologist on a site-specific basis.
    - Re-route existing OHV use to routes at a safe distance from the nest.
    - Close or detour existing roads in the proximity of the nest site.
    - Prohibit motor vehicle activities in the roost area.

Forest Plan Compliance

1. Alternative 2 would not prohibit cross-country travel; therefore, this alternative would not prevent disturbance within Designated Territories; therefore, this alternative would not comply with the above mentioned S&G. Alternatives 1, 3, 4, 5 would prohibit cross-country travel and would not add any routes within Designated Territories; therefore, these alternatives would comply with the above mentioned S&G.
2. Alternative 2 would not prohibit cross-country travel; therefore, this alternative would not prevent disturbance outside Designated Territories; therefore, this alternative would not comply with the above mentioned S&G. Alternatives 1, 3, 4, 5 would prohibit cross-country travel and would not add any routes near nest sites outside of Designated Territories; therefore, these alternatives would comply with the above mentioned S&G.

Peregrine Falcon

The peregrine falcon was listed as a federally endangered species from 1970 through 1999. On August 25, 1999 the final rule was published to de-list the peregrine falcon and it was then identified by the Regional Forester as a Sensitive Species on the STF (64 FR 46542, USDA Forest Service 2007a).

Forest Plan Direction

Implement a limited operating period (LOP), from February 1 through July 31, on all peregrine falcon territories active within the preceding five years, for at least 0.5 miles from the nest.

- Restrict motor vehicle activities and new road construction; during this LOP, according to a management plan for the area.
- Prohibit motor vehicle activity within 200 feet of lake shorelines that are used by peregrine falcons.

Forest Plan Compliance

Alternative 2 would not prohibit cross-country travel; therefore, this alternative would not prevent disturbance within peregrine falcon territories; therefore, this alternative would not comply with the above mentioned S&G. Alternatives 1, 3, 4, 5 would prohibit cross-country travel and would not add any routes within peregrine falcon territories; therefore, these alternatives would comply with the above mentioned S&G.

Valley Elderberry Longhorn Beetle

On August 8, 1980, the valley elderberry longhorn beetle (VELB) was listed as a threatened species (45 FR 52803). Critical habitat was also designated at this time, but does not occur on the STF. Project Design Criteria (PDC) for route designation were determined through a

programmatic consultation with the USFWS to achieve “No Effect” or “May Affect Not Likely to Adversely Affect” determinations.

USFWS Project Design Criteria

1. Staging areas are not within 100 feet of occupied VELB sites or suitable habitat of elderberry plants containing stems measuring 1.0 inches or greater in diameter at ground level.
2. Routes or areas are not within 20 feet of occupied VELB sites or suitable habitat of elderberry plants containing stems measuring 1.0 inches or greater in diameter at ground level.

Project Design Criteria Compliance

1. The project alternatives do not propose to add any staging areas; therefore, all project alternatives would be in compliance with the above mentioned PDC.
2. Alternative 2 would not prohibit cross-country travel; therefore, this alternative would not prevent the creation of routes within 20 feet of occupied VELB sites or suitable habitat; therefore, this alternative would not comply with the above mentioned PDC. Field surveys were completed on all routes below 3000 feet in elevation that were proposed to be added within Alternatives 1, 4 and 5. Alternatives 1, 3, 4, 5 would prohibit cross-country travel and would not add any routes within 20 feet of occupied VELB sites or suitable habitat; therefore, these alternatives would comply with the above mentioned PDC.

Lahontan Cutthroat Trout

The Lahontan cutthroat trout (LCT) was listed by the USFWS as an endangered species in 1970 (35 FR 13520). The listing was reclassified to threatened status in 1975 to facilitate recovery and management efforts and authorize regulated angling (40 FR 29864). Critical Habitat has not been designated for the LCT (USDI 1995). Project Design Criteria (PDC) for route designation were determined through a programmatic consultation with the USFWS to achieve “No Effect” or “May Affect Not Likely to Adversely Affect” determinations.

USFWS Project Design Criteria

1. Routes and areas do not cross any stream within the occupied range of LCT.
2. Route and areas are not located on active landslides and do not re-route surface water onto active landslides within watersheds that provide habitat for LCT.
3. Within watersheds that provide habitat for LCT, routes or areas do not have the potential to capture surface run-off and then deliver sediment into a stream.
4. Areas are located outside of Riparian Conservation Areas (RCAs) that are within watersheds that provide habitat for LCT.
5. Within watersheds that provide habitat for LCT, routes avoid RCAs.

Project Design Criteria Compliance

1. Alternative 2 would not prohibit cross-country travel; therefore, this alternative would not prevent the creation of routes and stream crossings within the occupied range of LCT; therefore, this alternative would not comply with the above mentioned PDC. Alternatives 1, 3, 4, 5 would prohibit cross-country travel and would not add any routes or stream crossings within the occupied range of LCT; therefore, these alternatives would comply with the above mentioned PDC.
2. Alternative 2 would not prohibit cross-country travel; therefore, this alternative would not prevent the creation of routes on active landslides nor would it prevent the creation of routes that could potentially divert surface water onto active landslides within watersheds that provide habitat for LCT; therefore, this alternative would not comply with the above mentioned PDC. Alternatives 1, 3, 4, 5 would prohibit cross-country travel and would not add any routes on active landslides nor would they add any routes that could potentially divert

surface water onto active landslides within watersheds that provide habitat for LCT; therefore, these alternatives would comply with the above mentioned PDC.

3. Alternative 2 would not prohibit cross-country travel; therefore, this alternative would not prevent the creation of routes that may have the potential to capture surface run-off and then deliver sediment into a stream that provides habitat for LCT; therefore, this alternative would not comply with the above mentioned PDC. Alternatives 1, 3, 4, 5 would prohibit cross-country travel and would not add any routes that may have the potential to capture surface run-off and then deliver sediment into a stream that provides habitat for LCT; therefore, these alternatives would comply with the above mentioned PDC.
4. Alternative 2 would not prohibit cross-country travel; therefore, this alternative would not prevent the creation of routes within RCAs that are within watersheds that provide habitat for LCT; therefore, this alternative would not comply with the above mentioned PDC. Alternatives 1, 3, 4, 5 would prohibit cross-country travel and would not add any routes within RCAs that are within watersheds that provide habitat for LCT; therefore, these alternatives would comply with the above mentioned PDC.
5. Alternative 2 would not prohibit cross-country travel; therefore, this alternative may result in the creation of routes that do not avoid RCAs within watershed that provide habitat for LCT; therefore, this alternative would not comply with the above mentioned PDC. Alternatives 1, 3, 4, 5 would prohibit cross-country travel and would not add any routes within RCAs that are within watersheds that provide habitat for LCT; therefore, these alternatives would comply with the above mentioned PDC.

California Red-legged Frog

On May 23, 1996, the California red-legged frog was listed as a threatened species (61 FR 25813). On April 13, 2006 critical habitat was designated, but does not exist on the STF (71 FR 19244). To assist with the Travel Management Planning process, Region 5 USFS entered into programmatic consultation with the United States Fish and Wildlife Service (USFWS) for motorized vehicle route designation. On December 27, 2006, the USFWS issued a Letter of Concurrence for 14 National Forests in California, including the STF. The Letter of Concurrence approved the Project Design Criteria (PDC) as outlined in the document entitled “Route Designation: Project Design Criteria for ‘No Effect’ or ‘May Affect Not Likely to Adversely Affect’ determination for TE Species – October 2006 version 1”. Therefore, without further consultation with USFWS all actions proposed within a Travel Management Plan Alternatives (analyzed in detail) must comply with the PDC to reach a determination of “No Effect” or “May Affect Not Likely to Adversely Affect” for TE species.

USFWS Project Design Criteria

1. Routes or areas do not have the potential to capture surface run-off and then deliver sediment into a stream associated with the California red-legged frog.
2. In suitable California red-legged frog habitat, routes avoid Riparian Reserve (RR) and Riparian Conservation Areas (RCAs) except where necessary to cross streams. Crossing approaches get the riders in and out of the stream channel and riparian area in the shortest distance possible while meeting the gradient and approach length standards.
3. Routes or areas do not cross any stream or waterbody within 500 feet of known occupied sites of California red-legged frog; and route or area is not within a distance of 500 feet from wetland (i.e. springs, wet meadows, ponds, marshes).
4. In habitat occupied by California red-legged frog, routes or areas do not have the potential to capture or divert stream flow. The approaches to stream crossings are down-sloped toward the stream on both sides.
5. Areas are located outside of RR and RCAs, meadows, and wetlands, within California red-legged frog habitat.
6. No route or areas are within Critical Aquatic Refuges for California red-legged frog.

Project Design Criteria Compliance

1. Alternative 2 would not prohibit cross-country travel; therefore, this alternative would not prevent the creation of routes that may have the potential to capture surface run-off and then deliver sediment into a stream associated with the California red-legged frog; therefore, this alternative would not comply with the above mentioned PDC. Alternative 3 would prohibit cross-country travel and would not add any routes to the NFTS; therefore, this alternative would comply with the above mentioned PDC. Alternatives 1 and 4 would prohibit cross-country travel but would add routes that may have the potential to capture surface run-off and then deliver sediment into a stream associated with the California red-legged frog; therefore, these alternatives would not comply with the above mentioned PDC (Table 3.11-52). Alternative 5 would prohibit cross-country travel and would not add routes that may have the potential to capture surface run-off and then deliver sediment into a stream associated with the California red-legged frog; therefore, this alternative would comply with the above mentioned PDC (Table 3.11-52).
2. Alternative 2 would not prohibit cross-country travel; therefore, this alternative would not prevent the creation of routes that avoid RCAs except where necessary to cross streams in suitable California red-legged frog habitat; therefore, this alternative would not comply with the above mentioned PDC. Alternative 3 would prohibit cross-country travel and would not add any routes to the NFTS; therefore, this alternative would comply with the above mentioned PDC. Alternatives 1 and 4 would prohibit cross-country travel but would add routes that do not avoid RCAs except where necessary to cross streams in suitable California red-legged frog habitat; therefore, these alternatives would not comply with the above mentioned PDC (Table 3.11-52). Alternative 5 would prohibit cross-country travel and would not add routes that do not avoid RCAs except where necessary to cross streams in suitable California red-legged frog habitat; therefore, this alternative would comply with the above mentioned PDC (Table 3.11-52).
3. There are not any known occupied sites of California red-legged frog within the project area; therefore, all the project alternatives would comply with the above mentioned PDC.
4. There are not any known occupied sites of California red-legged frog within the project area; therefore, all the project alternatives would comply with the above mentioned PDC.
5. There are not any Critical Aquatic Refuges for California red-legged frog within the project area; therefore, all the project alternatives would comply with the above mentioned PDC.

Table 44. Routes inconsistent with USFWS PDC for the California red-legged frog

Route Number	PDC Consistency	Addition to the NFTS		
		ALT 1	ALT 4	ALT 5
17EV192	Inconsistent	Yes	Yes	No
17EV192A	Inconsistent	Yes	Yes	No
17EV192B	Inconsistent	Yes	Yes	No
17EV194	Inconsistent	Yes	Yes	No
1S17M	Inconsistent	Yes	Yes	No
FR98488	Inconsistent	Yes	Yes	No
FR98508	Inconsistent	Yes	Yes	No
FR98509	Inconsistent	Yes	Yes	No
FR98510	Inconsistent	Yes	Yes	No
FR98511	Inconsistent	Yes	Yes	No
FR98514	Inconsistent	Yes	Yes	No
FR98566	Inconsistent	Yes	Yes	No
FR98575	Inconsistent	Yes	Yes	No

Forest Plan Direction

Within 300 feet of streams or ponds that have potential suitable habitat:

- Construct new roads or trails or use off-road routes for motorized vehicles only after conducting amphibian surveys to the most recent protocol for the frog.

- Allow stream crossings only where the route, through the water, and the adjacent streamside areas are naturally resistant to tires or are hardened with rock or other materials.

Forest Plan Compliance

Table 45. Routes inconsistent with the Forest Plan for the California red-legged frog

Route Number	Forest Plan Consistency	Addition to the NFTS		
		ALT 1	ALT 4	ALT 5
17EV192	Inconsistent	Yes	Yes	No
17EV192A	Inconsistent	Yes	Yes	No
17EV192B	Inconsistent	Yes	Yes	No
17EV194	Inconsistent	Yes	Yes	No
17EV195	Inconsistent	Yes	Yes	No
17EV196	Inconsistent	Yes	Yes	No
17EV197	Inconsistent	Yes	Yes	No
1S1734A	Inconsistent	No	Yes	No
1S17E35B	Inconsistent	Yes	Yes	No
1S17M	Inconsistent	Yes	Yes	No
FR10178	Inconsistent	Yes	Yes	No
FR8516	Inconsistent	Yes	Yes	No
FR98481	Inconsistent	Yes	Yes	No
FR98488	Inconsistent	Yes	Yes	No
FR98508	Inconsistent	Yes	Yes	No
FR98509	Inconsistent	Yes	Yes	No
FR98510	Inconsistent	Yes	Yes	No
FR98511	Inconsistent	Yes	Yes	No
FR98513	Inconsistent	Yes	Yes	No
FR98514	Inconsistent	Yes	Yes	No
FR98566	Inconsistent	Yes	Yes	No
FR98575	Inconsistent	Yes	Yes	No

Alternative 2 would not prohibit cross-country travel; therefore, this alternative would not prevent the creation of routes or unhardened stream crossings within 300 feet of potential suitable habitat for the California red-legged frog; therefore, this alternative would not comply with the above mentioned S&G. Alternative 3 would prohibit cross-country travel and would not add any routes to the NFTS; therefore, this alternative would comply with the above mentioned S&G. Alternative 5 would prohibit cross-country travel and would not add any routes within 300 feet of potential suitable California red-legged frog habitat; therefore, this alternative would comply with the above mentioned S&G. Alternatives 1 and 4 would prohibit cross-country travel but would add routes and unhardened stream crossings within 300 feet of potential suitable habitat for the California red-legged frog (Table 3.11-53). Mitigation measures (surveys completed to protocol and hardened stream crossings) are proposed on these routes to ensure that Alternatives 1 and 4 would comply with the above mentioned S&G.

Western Pond Turtle

The western pond turtle was identified by the Regional Forester as a Sensitive Species on the STF (USDA 2007a).

Forest Plan Direction

In areas adjacent to waters with known populations of western pond turtle:

- Construct new roads or trails or use existing off-road routes for motorized vehicles only if at least ¼ mile from occupied habitat or where approved by a Wildlife Biologist.

Forest Plan Compliance

Table 46. Routes inconsistent the Forest Plan for the western pond turtle

Route Number	Forest Plan Consistency	Addition to the NFTS		
		ALT 1	ALT 4	ALT 5
17EV192	Inconsistent	Yes	Yes	No
17EV192A	Inconsistent	Yes	Yes	No
17EV192B	Inconsistent	Yes	Yes	No
17EV194	Inconsistent	Yes	Yes	No
17EV195	Inconsistent	Yes	Yes	No
17EV196	Inconsistent	Yes	Yes	No
17EV197	Inconsistent	Yes	Yes	No
17EV197A	Inconsistent	Yes	Yes	No
17EV901	Inconsistent	Yes	Yes	No
1S1727	Inconsistent	Yes	Yes	No
1S17E35B	Inconsistent	Yes	Yes	No
1S17M	Inconsistent	Yes	Yes	No
1S1902	Inconsistent	Yes	Yes	No
1S1907A	Inconsistent	No	Yes	No
1S1929	Inconsistent	Yes	Yes	No
1S1929C	Inconsistent	Yes	Yes	No
FR10178	Inconsistent	Yes	Yes	No
FR8516	Inconsistent	Yes	Yes	No
FR8601	Inconsistent	Yes	Yes	No
FR98482	Inconsistent	Yes	Yes	No
FR98486	Inconsistent	Yes	Yes	No
FR98488	Inconsistent	Yes	Yes	No
FR98504	Inconsistent	Yes	Yes	No
FR98508	Inconsistent	Yes	Yes	No
FR98509	Inconsistent	Yes	Yes	No
FR98510	Inconsistent	Yes	Yes	No
FR98511	Inconsistent	Yes	Yes	No
FR98513	Inconsistent	Yes	Yes	No
FR98514	Inconsistent	Yes	Yes	No
FR98515	Inconsistent	Yes	Yes	No
FR98520	Inconsistent	Yes	Yes	No
FR98537	Inconsistent	Yes	Yes	No
FR98539	Inconsistent	Yes	Yes	No
FR98541	Inconsistent	Yes	Yes	No
FR98548	Inconsistent	Yes	Yes	No
FR98554	Inconsistent	Yes	Yes	No
FR98560	Inconsistent	Yes	Yes	No
FR98566	Inconsistent	Yes	Yes	No
FR98575	Inconsistent	Yes	Yes	No
FR98599	Inconsistent	Yes	Yes	No

Alternative 2 would not prohibit cross-country travel; therefore, this alternative would not prevent the creation of routes within ¼ mile of occupied pond turtle habitat and would not comply with the above mentioned S&G. Alternative 3 would prohibit cross-country travel and would not add any routes to the NFTS; therefore, this alternative would comply with the above mentioned S&G. Alternative 5 would prohibit cross-country travel and would not add any routes to the NFTS within ¼ mile of occupied pond turtle habitat; therefore, this alternative would comply with the above mentioned S&G. Alternatives 1 and 4 would prohibit cross-country travel but would add routes

within ¼ mile of occupied pond turtle habitat that were not approved by a Wildlife Biologist; therefore, these routes would not comply with the above mentioned S&G (Table 3.11-54).

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