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Summary

Final Biological Evaluation For R5 Sensitive Animals

Giant Sequoia National Monument Management Plan FEIS

Fresno and Tulare Counties

Sequoia National Forest, Giant Sequoia National Monument

Summary

This Biological Evaluation (BE) covers programmatic effects of long-term management of the Giant Sequoia National Monument on sensitive aquatic and terrestrial animals (fish and wildlife, including reptiles and amphibians). Analysis of effects is tiered to the 2001 Sierra Nevada National Forest Plan Amendment. Federally listed species covered by the Endangered Species Act are addressed in a separate document (Biological Assessment). Species addressed and determinations are summarized in the following table:

Species	Status	Determination
Northern goshawk *(Accipiter gentilis)*	FSS, CSSC	All Alternatives: may affect individuals, not likely to result in a trend toward Federal listing or loss of viability.
Little willow flycatcher *(Empidonax trailii brewsterii)*	FSS, SE	Alternative A: will have no effect. Alternatives B, C, D, E, and F: may affect individuals, not likely to result in a trend toward Federal listing or loss of viability.
Bald eagle *(Haliaeetus leucocephalus)*	FSS, SP, SE	Alternatives A, B, C, D, and E: will have no effect. Alternative F: may affect individuals, not likely to result in a trend toward Federal listing or loss of viability.
Great gray owl *(Strix nebulosa)*	FSS, SE	All Alternatives: may affect individuals, not likely to result in a trend toward Federal listing or loss of viability.
California spotted owl *(Strix occidentalis occidentalis)*	FSS, CSSC	All Alternatives: may affect individuals, not likely to result in a trend toward Federal listing or loss of viability.
Pallid bat *(Antrozous pallidus)*	FSS, CSSC	All Alternatives: may affect individuals, not likely to result in a trend toward Federal listing or loss of viability.
Townsend's big eared bat *(Corynorhinus townsendii townsendii)*	FSS, CSSC	All Alternatives: will have no effect.
Western red bat *(Lasiurus blossevillii)*	FSS, CSSC	All Alternatives: may affect individuals, not likely to result in a trend toward Federal listing or loss of viability.
California wolverine *(Gulo gulo luteus)*	FSS, ST, SP, FC	All Alternatives: may affect individuals, not likely to result in a trend toward Federal listing or loss of viability.
American marten *(Martes americana)*	FSS, CSSC	All Alternatives: may affect individuals, not likely to result in a trend toward Federal listing or loss of viability.
Pacific fisher *(Martes pennanti pacifica)*	FSS, FC, CSSC	All Alternatives: may affect individuals, not likely to contribute toward a further downward trend or a loss of viability.
Relictual slender salamander *(Batrachoceps relictus)*	FSS, CSSC	All Alternatives: may affect individuals, not likely to result in a trend toward Federal listing or loss of viability.
Foothill yellow-legged frog *(Rana boylii)*	FSS, CSSC	Alternatives A, B, C, D, and F: will have no effect. Alternative E: may affect individuals, not likely to result in a trend toward Federal listing or loss of viability.

Species	Status	Determination
Mountain yellow-legged frog *(Rana muscosa)*	FSS, FC, CSSC	Alternatives A, B, C, D, and F: will have no effect. Alternative E: may affect individuals, not likely to result in a trend toward Federal listing or loss of viability.
Southwestern pond turtle *(Actinemys marmorata pallida)*	FSS, CSSC	All Alternatives: may affect individuals, not likely to result in a trend toward Federal listing or loss of viability.
California legless lizard *(Anniella pulchra)*	FSS, CSSC	All Alternatives: may affect individuals, not likely to result in a trend toward Federal listing or loss of viability.
Listing Status Key: FE=Federally Endangered, FT=Federally Threatened, FC=Federal Candidate SE=State Endangered, ST=State Threatened, SP=State Fully Protected, CSSC=Species of Special Concern FSS=U.S. Forest Service Region 5 Sensitive Species		

Introduction

This Biological Evaluation (BE) documents analysis of programmatic direction (long-term goal and objective based management) rather than individual projects under the Giant Sequoia National Monument (GSNM) Management Plan (Monument Plan) Final Environmental Impact Statement (FEIS). A determination is made on potential effects to wildlife species listed as Sensitive by the Regional Forester, Pacific Southwest Region, USDA Forest Service for the Sequoia National Forest. Site-specific documentation will occur for all individual projects carried out under this programmatic direction.

Species listed as Threatened, Endangered, or Proposed for listing (Listed species) under the Endangered Species Act (ESA) by the U.S. Fish and Wildlife Service (USFWS) are addressed in a separate document (Biological Assessment [BA] for the Monument Plan FEIS). USFWS candidates for listing under the ESA are included with Forest Service Sensitive species in this document.

This BE was prepared in accordance with Forest Service Manual (FSM) direction 2672.42. Species that were evaluated are shown in Table 1.

Table 83 Species Reviewed for Inclusion in the GSNM Biological Evaluation

Species	Status	Habitat	Potential Occurrence in Giant Sequoia NM	Analyzed?
Birds				
Northern goshawk *(Accipiter gentilis)*	FSS, CSSC	Dense mixed conifer forest to open eastside pine.	Present in GSNM. Suitable habitat and nesting occurs within GSNM.	Yes
Western yellow billed cuckoo *(Cocczyus americanus occidentalis)*	FSS, FC, SE	Dense riparian forest. Only known location at Lake Isabella.	GSNM outside known range and lacks suitable habitat.	No
Little willow flycatcher *(Empidonax trailii brewsterii)*	FSS, SE	Large meadow (15+ acre) complexes with dense willow and standing water, up to 8,000'.	Five historic sites in GSNM. Detections since 2001.	Yes
Bald eagle *(Haliaeetus leucocephalus)*	FSS, SP, SE	Lakes and open water. Nests on large trees.	Winter resident along Kings River. Occasional visitor to Tule River, White River and Hume Lake.	Yes

Species	Status	Habitat	Potential Occurrence in Giant Sequoia NM	Analyzed?
Great gray owl *(Strix nebulosa)*	FSS, SE	Large meadows & openings 2,500'-9,000'. Dense forest and large snags for nesting.	Nesting in one location in 2009. Historic records at several additional locations.	Yes
California spotted owl *(Strix occidentalis occidentalis)*	FSS, CSSC	Dense forest (>40 percent canopy closure), preference is shown for stands with ≥2 layers, but open enough to allow for observation and flying space to attack prey. Substantial amounts of dead woody debris are desirable.	Present in GSNM. Suitable habitat and nesting occur within GSNM.	Yes
Mammals				
Pallid bat *(Antrozous pallidus)*	FSS, CSSC	Open habitats, rocky crevices, tree cavities, mines, caves, or buildings for maternity roosts. Deep crevices are important for day roosts.	Present in GSNM. Presumably forages in suitable habitat throughout the forest. No maternity roosts documented in GSNM.	Yes
Townsend's big eared bat *(Corynorhinus townsendii townsendii)*	FSS, CSSC	Nocturnal, roosts in caves, uses wide variety of habitats although usually mesic areas for foraging.	Present in GSNM.	Yes
Western red bat *(Lasiurus blossevillii)*	FSS, CSSC	Associated with riparian habitat, roosts in trees and forages over open woodlands and grasslands.	Present in GSNM.	Yes
California wolverine *(Gulo gulo luteus)*	FSS, FC, ST, SP	Remote habitats, sensitive to human presence. 4,000' to 13,000' mixed habitats.	Historic and unconfirmed recent observations on the forest.	Yes
American marten *(Martes americana)*	FSS, CSSC	Dense forest (>30 percent canopy cover), high number of large snags and down logs, close proximity to dense riparian corridors for movement, and an interspersion of small (<1 acre) openings with good ground cover for foraging. Potential occupied elevation 4,000'-13,000'.	Present in GSNM. Recent surveys indicate marten occur throughout suitable habitat.	Yes
Pacific fisher *(Martes pennanti pacifica)*	FSS, FC	Dense forest (>40 percent canopy cover), high number of large snags and down logs, close proximity to dense riparian corridors for movement, and an interspersion of small (<1 acre) openings with good ground cover for foraging. Potential occupied elevation 3,500'-8,000'.	Present in GSNM. Suitable habitat and recent surveys indicate occurrence in black oak woodland and mixed conifer over most of GSNM. Generally found below deep snow zone.	Yes

Species	Status	Habitat	Potential Occurrence in Giant Sequoia NM	Analyzed?
Sierra Nevada red fox *(Vulpes vulpes necator)*	FSS, ST	Appears to prefer red fir and lodgepole forests in sub alpine and alpine zone. Forages in meadows & riparian zones, mostly above 7,000'.	No confirmed historical records in area. Outside currently occupied range.	No
Amphibians				
Yellow blotched salamander *(Ensatina escholtzii croceator)*	FSS, CSSC	Valley foothil/hardwood habitats and conifer, moist habitats, and down logs in tributaries of the lower Kern River.	GSNM is outside of known range for this species.	No
Inyo Mountain slender salamander *(Batrachoceps campi)*	FSS, CSSC	Down logs and moist areas in desert. Known range limited to Inyo Mountains.	GSNM is outside of known range for this species.	No
Relictual slender salamander *(Batrachoceps relictus)*	FSS, CSSC	Down logs and moist areas, generally in mixed conifer zone.	Present in southern portion of GSNM.	Yes
Tehachapi slender salamander *(Batrachoceps stebbensii)*	FSS, ST	Down logs and moist areas, below 3,500'. Limited to canyon and desert areas of Tehachapi to Caliente.	GSNM is outside of known range for this species.	No
Kern Canyon slender salamander *(Batrachoceps simatus)*	FSS, ST	Down logs and moist areas, below 3,500'. Limited to Kern Canyon.	GSNM is outside of known range for this species.	No
Kern Plateau slender salamander *(Batrachoceps sp.)*	FSS, CSSC	Down logs and moist areas, ~7,000-8,000'. Limited to Kern Plateau.	GSNM is outside of known range for this species.	No
Breckenridge slender salamander *(Batrachoceps sp.)*	FSS, CSSC	Down logs and moist areas in the Breckenridge area.	GSNM is outside of known range for this species.	No
Foothill yellow-legged frog *(Rana biylii)*	FSS, CSSC	Low gradient streams and ponds generally below 6,000'.	Historically present in GSNM, no known populations at this time.	Yes
Mountain yellow-legged frog *(Rana muscosa)*	FSS, FC, CSSC	Historically found in lakes and streams from 4,500-12,000'.	Historically present in GSNM. Currently present only in Golden Trout Wilderness.	Yes
Reptiles				
Southwestern pond turtle *(Actinemys marmorata pallida)*	FSS, CSSC	Low gradient ponds and streams with basking sites below 5,000'. Can be found up to 1 mile from perennial water.	Present in GSNM.	Yes
Sierra night lizard *(Xantusia vigilis sierrae)*	FSS, CSSC	Annual grasslands. Not known outside of limited range near Granite Station, Kern County.	GSNM is outside of known range for this species.	No

Species	Status	Habitat	Potential Occurrence in Giant Sequoia NM	Analyzed?
California legless lizard *(Anniella pulchra)*	FSS, CSSC	Loose, moist soil in chaparral and valley foothill woodland. Generally below 6,000'.	Presumed present in suitable habitat.	Yes
Fish				
Hardhead *(Mylopharodon conocephalus)*	FSS, CSSC	Warm water rivers at low elevation.	GSNM is outside of known range for this species.	No
Volcano Creek (California) golden trout *(Oncorhynchus mykiss aguabonita)*	FSS, CSSC	Cold water tributaries of the South Fork of the Kern River above Rockhouse Basin.	GSNM is outside of known range for this species.	No
Listing Status Key: FE=Federally Endangered, FT=Federally Threatened, FC=Federal Candidate SE=State Endangered, ST=State Threatened, SP=State Fully Protected, CSSC=Species of Special Concern FSS=U.S. Forest Service Region 5 Sensitive Species				

2.0 Consultation to Date

Consultation for Federally listed species under the Endangered Species Act is documented in the BA for the GSNM Plan FEIS. This document (BE) is limited to Forest Service sensitive species. The Sensitive Species list is designated by the Regional Forester (Pacific Southwest Region) and was last updated in October, 2007.

3.0 Current Management Direction

3.1 Management Documents

Current management direction and desired conditions for Sensitive species on the Sequoia National Forest can be found in the following documents, filed at the Supervisor's Office and available online:

- Forest Service Manual and Handbooks (FSM/H 2670)
- National Forest Management Act (NFMA)
- National Environmental Policy Act (NEPA)
- Sequoia National Forest Land and Resource Management Plan 1988 (LRMP)
- Sierra Nevada Forest Plan Amendment (SNFPA) and Record of Decision (SNFPA ROD) 2001
- Regional Forester policy and management direction
- Presidential proclamation establishing the Giant Sequoia National Monument (proclamation)

Species-specific direction is described in Section 5.0 of this document. The Sequoia LRMP and amendments incorporate Regional direction for each species.

3.2 Forest Service Manuals

FSM 2670.32 Sensitive Species

- Assist States in achieving their goals for conservation of endemic species.
- 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 U.S. Fish and Wildlife Service and the States.

3.3 Local Management Direction

Three documents provide the most current and applicable requirements pertinent to this project:

- 1988 Sequoia National Forest Land and Resource Management Plan (LRMP)
- 2000 Presidential proclamation establishing the Giant Sequoia National Monument (proclamation)
- 2001 Sierra Nevada Forest Plan Amendment

Description of Alternatives

4.0 Description of the Alternatives

Below is a description of elements of the six alternatives in the Monument Plan FEIS considered important to wildlife and wildlife habitat. A complete description of the alternatives can be found in Chapter 2 of the Monument Plan FEIS.

Common to All Alternatives

Lands in the Monument continue to provide a diverse range of habitats that support viable populations of associated vertebrate species, with special emphasis on riparian areas, montane meadows, and late successional forest. Proper hydrologic and ecological functioning conditions in riparian areas and meadows are restored and maintained. Old forest habitat is in suitable quality, quantity, and distribution to support viable populations of late successional dependent species, including Pacific fishers, American martens, California spotted owls, northern goshawks, and great gray owls. The configuration of habitat in the Monument provides connectivity and heterogeneity. Ecological conditions in the Monument contribute to the recovery of federally threatened and endangered species such as the California condor and Springville clarkia, and help avoid federal listing of Forest Service sensitive species

Pacific Fisher Habitat Management

All of the alternatives would assess the effect of fuels management on fisher habitat using models appropriate to the scale of the project. Monitoring of the status of fishers in the Monument will continue as detailed in the Monument Plan.

Alternative A—(No Action–Current Management)

Current management direction for the Monument comes from several sources:

- The 1988 Sequoia National Forest Land and Resource Management Plan (Forest Plan)
- The 1990 Sequoia National Forest Land Management Plan Mediated Settlement Agreement (MSA)
- The 1991 Kings River Wild and Scenic River and Special Management Area Implementation Plan (KRSMA)
- The 2000 Presidential proclamation establishing the Monument (proclamation)
- The 2001 Sierra Nevada Forest Plan Amendment (2001 SNFPA)

There are a number of standards and guidelines associated with the existing management goals and objectives and land allocations from the 1988 Forest Plan, the 1990 MSA, the proclamation, and the 2001 SNFPA (See Appendix B).

The current management of the Monument includes a number of land allocations from the 2001 SNFPA for wildlife protection including: Southern Sierra Fisher Conservation Area (SSFCA), old forest emphasis areas, den site buffers for fisher and American marten, and protected activity centers (PACs) for California spotted owl, northern goshawks, and great gray owls. It also requires habitat protection for meadows occupied by little willow flycatchers. Riparian Conservation Areas (RCAs) and Critical Aquatic Refuges (CARs) guidelines follow the 2001 SNFPA and also provide protection for important wildlife habitat.

Alternative B

Alternative B includes the proposed action, and was developed to identify the changes to current management direction needed to comply with the Clinton proclamation. Alternative B includes strategies that are responsive to the issues of recreation and public use, fuels management/community protection, and fires spreading to tribal lands. For Alternative B, a full range of recreation

opportunities, including dispersed camping, developed camping, and the use of off-highway vehicles (OHVs) on designated roads would continue.

Protection of Objects of Interest

Alternative B would retain all of the land allocations and standards and guidelines from the 2001 SNFPA, except where noted as changed to better protect the objects of interest. For Alternative B, the Freeman Creek Grove would be designated as a botanical area, as prescribed by the 1990 MSA (MSA, p. 17). Alternative B includes multiple tools for decreasing fuel buildups and reducing the risk of uncharacteristically large-scale wildfire, which may threaten the objects of interest.

Promotion of Resiliency

Alternative B is expected to promote resilient vegetation communities through the use of prescribed fire, mechanical treatment, and managed wildfire (when available), in order of priority. Vegetation management projects for ecological restoration and maintenance would consider using prescribed fire first and be focused in the Wildland Urban Intermix (WUI) defense and threat zones, with diameter limits throughout the Monument.

Alternative B allows tree felling for fuels management and ecological restoration. No trees with a diameter greater than 20 inches dbh may be cut, except for safety issues.

Promotion of Heterogeneity

Alternative B was designed to improve heterogeneity through the use of multiple tools for ecological restoration and maintenance. It would use these tools to reduce fuels, encourage natural regeneration, and increase the diversity in species composition and age.

Recreation Opportunities

Alternative B would continue to provide current recreation opportunities, with a focus on the development of new recreation facilities or opportunities as visitor use increases.

Vegetation, Including Giant Sequoia Groves

For Alternative B, ecological restoration of forested ecosystems would be accomplished by reducing fuels, improving stand resilience and health, promoting heterogeneity, and encouraging natural regeneration of giant sequoias and other species. In areas where natural regeneration is not likely, planting would occur. Resiliency would be improved by using prescribed fire, mechanical treatment, and managed wildfire (when available).

Fire and Fuels

Alternative B uses a WUI defense zone that extends approximately one-quarter mile from developed private land, and a WUI threat zone that extends another one and one-quarter mile from the defense zone. Designated WUI defense zones would cover 45,342 acres (13 percent) of the Monument and threat zones 145,522 acres 41 percent) of the Monument.

Alternative B includes the 56,591 acre Tribal Fuels Emphasis Treatment Area (TFETA). The TFETA was developed in response to discussions with the Tule River Indian Tribe and the concern over fires spreading to tribal lands. The Tribal Forest Protection Act of 2004 authorizes the Forest Service to enter into an agreement with Indian tribes meeting certain criteria to carry out projects to protect Indian forest land. This land allocation was designed along the boundary with the Tule River Indian Reservation to not only protect the reservation and its watersheds, but also the objects of interest and watersheds in the Monument, from fires spreading from one to the other.

Wildlife and Plant Habitat

Alternative B would replace the 2001 SNFPA standards and guidelines for great gray owl and little willow flycatcher habitat with standards based on the 2004 SNFPA. The 2004 SNFPA includes management direction for these species that is adaptable to local site conditions, while carrying forward the protection measures set in place by the 2001 SNFPA.

Range

For Alternative B, standards and guidelines for livestock grazing from the 2004 SNFPA would replace the 2001 SNFPA direction. Some management direction from the 1988 Forest Plan and 1990 MSA would also be used.

Hydrological Resources

Alternative B would replace the strategies, objectives, and standards and guidelines for the riparian

conservation objectives (RCOs) from the 2001 SNFPA with management direction based on the 2004 SNFPA. The 2004 SNFPA reduces redundancy and describes more consistent direction for hydrological resources, while maintaining the intent of the Aquatic Management Strategy.

Transportation

For Alternative B, the majority of the currently designated road and trail system would be available for use, retaining access similar to current levels for dispersed recreation, private ownerships, and management activities. There would be the potential for some reduction in high-clearance vehicle roads over time.

OHVs would be allowed on designated roads. Over-snow vehicles (OSVs) would be allowed on designated roads when covered with snow, unless specifically prohibited. Non-motorized mechanized vehicles (mountain bikes) would be allowed on designated roads and trails unless specifically prohibited. Alternative B emphasizes opportunities for creating loop trails and roads, with the potential for the construction of new roads for developed recreation facilities and loop driving opportunities. Decommissioned roads could be converted to trails.

Alternative C

Alternative C was developed to manage the Monument similar to the Sequoia and Kings Canyon National Parks (SEKI) in a manner that is consistent with Forest Service regulations and the direction of the Clinton proclamation. Some management policies or direction from SEKI would not be applicable to the Monument because of differences in law, regulation, and policy for the two federal agencies. For Alternative C, restoration activities would focus on areas that have been affected by human use and occupation. Recreation opportunity management would be similar to SEKI management.

Protection of Objects of Interest

Alternative C would not use many of the land allocations associated with the 2001 SNFPA, nor the standards and guidelines associated with them, such as those for wildlife and plant habitat. New standards and guidelines would be used throughout the Monument, rather than in specific land allocations. No new special areas are proposed, because the entire Monument would be considered a special area. Alternative C would limit vegetation and fuels management to areas of human use and influence. To address fuels buildup, Alternative C relies primarily on prescribed fire and managed wildfire, and limits the use of mechanical treatments.

Promotion of Resiliency

Alternative C would allow natural processes to prevail, focusing on the resumption of natural processes in areas altered by human use. It is expected to promote resilient vegetation communities through the use of prescribed fire and managed wildfire (when available), and limited mechanical treatment, in order of priority. Alternative C would limit the tools used for ecological restoration and maintenance. It would focus necessary treatments in the WUI defense zones, with diameter limits for fuels reduction, fire protection, and giant sequoias throughout the Monument.

Promotion of Heterogeneity

Alternative C was designed to promote heterogeneity primarily through the use of prescribed burns and managed wildfire (when available). It would focus on the use of natural processes to reduce fuels, encourage natural regeneration, and increase the diversity in species composition and age, limiting treatments to areas of human use.

Recreation Opportunities

Alternative C would change the current recreation opportunities by focusing on developed recreation sites and concentrating new development in recreation opportunity areas.

Vegetation, Including Giant Sequoia Groves

For Alternative C, ecological restoration of forested ecosystems would be accomplished by reducing fuels, improving stand resilience and health, promoting heterogeneity, and encouraging natural regeneration of giant sequoias and other species. In areas where natural regeneration is not likely, planting would be used. Resiliency would be promoted by using prescribed fire and managed wildfire (when available) first, and mechanical treatment only as necessary.

Fire and Fuels

Alternative C uses a WUI defense zone that extends approximately 300 feet out from developed private land. No WUI threat zone is defined. Developed recreation sites and administrative sites would also have 300-foot buffers for fuels management. In Alternative C, WUI defense zones would only cover approximately 8,304 acres or two percent of the Monument.

Generally, any mechanical treatments for fuels reduction would only be considered in visually-sensitive buffer zones (WUI defense) around areas of concentrated human use.

Wildlife and Plant Habitat

Alternative C would not use any of the land allocations or management areas specific to wildlife and plant habitat from the 2001 SNFPA or 1988 Forest Plan.

Alternative C would replace the 2001 SNFPA standards and guidelines for great gray owl and little willow flycatcher habitat with standards based on the 2004 SNFPA. Some of the standards and guidelines for wildlife and plant habitat (such as those for limited operating periods [LOPs]) would be used throughout the Monument, rather than being tied to a specific land allocation.

Range

For Alternative C, standards and guidelines for livestock grazing from the 2004 SNFPA would replace the 2001 SNFPA direction. Some management direction from the 1988 Forest Plan and 1990 MSA would be used.

Hydrological Resources

Alternative C would make use of the strategies, objectives, and standards and guidelines for the RCOs from the 2001 SNFPA with management direction based on the 2004 SNFPA. Streamside management zones (SMZs) would be used to protect riparian areas, rather than the CARs and RCAs.

Human Use

In Alternative C, dispersed camping would no longer be allowed at the end of roads or along roadsides. Dispersed camping would be allowed only by permit in the Wildlands niche setting, in inventoried roadless areas, and portions of the KRSMA. Target shooting would not be allowed. Other forms of dispersed recreation (e.g., hiking, birdwatching, fishing, picnicking) would be allowed.

Transportation

Under Alternative C, the majority of the currently designated roads maintained for passenger vehicle use would remain open to the public. Most of the roads for high-clearance vehicles would be closed over time due to a reduction in dispersed recreation, and would only be open for administrative use. Roads not needed for public access or management activities could be decommissioned, resulting in a substantial reduction in roads over time. Decommissioned roads could be converted to pedestrian trails. OHVs would not be allowed on roads, and OSVs would only be allowed on snow-covered roads to access private property, or for administrative and emergency use. Non-motorized mechanized vehicles (mountain bikes) would be allowed only on designated roads, not trails. Alternative C could include the construction of new roads for developed recreation facilities and loop driving opportunities.

Alternative D

Alternative D focuses on managing through natural processes with little to no human manipulation. It relies on naturally-occurring fire to reduce fuels, to protect the objects of interest, and to promote giant sequoia regeneration. Alternative D includes strategies that are responsive to the issues of tree removal, fuels management/community protection, and methods for sequoia regeneration. Dispersed and developed camping would still be available, although creation of new sites would be limited.

Protection of Objects of Interest

Alternative D focuses on allowing natural processes to restore and maintain ecosystems. To address fuels buildup, it would use primarily managed wildfire and prescribed fire, allowing mechanical treatment only under limited circumstances in the WUI defense zones.

Promotion of Resiliency

Alternative D would allow natural processes to prevail and focus on the resumption of natural processes in areas altered by human use. It is expected to promote

resilient vegetation communities through the use of managed wildfire (when available), prescribed fire, and limited mechanical treatment, in order of priority. Alternative D would limit the tools used for ecological restoration and maintenance. It would focus necessary treatments in the WUI defense zones, with diameter limits for tree felling.

Promotion of Heterogeneity

Alternative D was designed to promote heterogeneity primarily through the use of managed wildfire (when available) and prescribed burns. It would focus on the use of natural processes to reduce fuels, encourage natural regeneration, and increase the diversity in species composition and age, limiting treatments to areas of human use.

Recreation Opportunities

Alternative D would limit the development of new recreation sites to walk-in campgrounds and picnic areas near existing roads. Instead, developed recreation would be encouraged outside the Monument.

Vegetation, Including Giant Sequoia Groves

For Alternative D, ecological restoration of forested ecosystems would be accomplished by reducing fuels, improving stand resilience and health, promoting heterogeneity, and relying on natural regeneration of giant sequoias and other species. No planting or herbicides or pesticides would be used to promote regeneration. Resiliency would be promoted by using managed wildfire (when available), prescribed fire, and mechanical treatment only as necessary.

Fire and Fuels

Alternative D uses a WUI defense zone that extends approximately 200 feet out from developed private land. No WUI threat zone or TEFTA is included in Alternative D. WUI defense zones would only cover 4,603 acres or one percent of the Monument.

In Alternative D, mechanical treatments would be used to reduce fuels so that prescribed fire or managed wildfire could burn without harming the objects of interest. Any trees cut in the WUI defense zone would be kept on site. Tree felling outside of the WUI defense zone would only be allowed to reduce risks to public and firefighter safety.

Wildlife and Plant Habitat

Alternative D includes most of the land allocations or management areas specific to wildlife and plant habitat from the 2001 SNFPA and 1988 Forest Plan, but not the old forest emphasis area and SSFCA allocations.

Alternative D would replace the 2001 SNFPA standards and guidelines for great gray owl and littlewillow flycatcher habitat with standards based on the 2004 SNFPA.

Range

Under Alternative D, standards and guidelines for livestock grazing from the 2004 SNFPA would replace the 2001 SNFPA direction. Some management direction from the 1988 Forest Plan and 1990 MSA would be used.

Hydrological Resources

Alternative D would replace the strategies, objectives, and standards and guidelines for the RCOs from the 2001 SNFPA with management direction based on the 2004 SNFPA.

Human Use

In Alternative D, dispersed camping would be allowed, but new development would be limited to walk-in campgrounds and picnic areas. No new non-recreation special uses would be permitted, except for scientific research, administrative needs, or nondiscretionary uses.

Transportation

For Alternative D, the majority of the currently designated roads maintained for passenger vehicle use would remain open to the public. Many of the roads for high-clearance vehicles and closed roads would be decommissioned over time due to a reduced need for access. Decommissioned roads could be converted to pedestrian trails. Roads would continue to be managed for dispersed recreation access. No new roads would be constructed. OHVs would not be allowed on roads, and OSVs would only be allowed on paved roads. Not all roads and trails are expected to be designated for bicycles, including mountain bikes. Non-motorized mechanized vehicles (mountain bikes) would be allowed on designated roads and trails.

Alternative E

Alternative E was designed to manage the Monument as guided by the 1990 MSA. The 1990 MSA "remains in effect to the extent it has not been amended by other NEPA-compliant amendments" (*People of the State of California, ex rel. Lockyer v. United States Department of Agriculture, et al., No. C-05-00898 CRB*). Alternative E incorporates all appropriate 1990 MSA provisions. It includes current management direction from the 1988 Forest Plan and the 1990 MSA that was modified to comply with the Bush and Clinton proclamations. Alternative E includes strategies that are responsive to the issue of the obligation to analyze the 1990 MSA under NEPA, and is designed to meet that obligation to consider and analyze the actions, standards, and guidelines contained in the 1990 MSA.

Protection of Objects of Interest

Alternative E would not use many of the land allocations from the 2001 SNFPA, but would use those 1988 Forest Plan management areas and associated management emphases, and their related standards and guidelines, that comply with the Clinton proclamation. All provisions of the 1990 MSA that are appropriate for the Monument are incorporated. For Alternative E, the Freeman Creek Grove would be designated as a botanical area, as prescribed by the 1990 MSA (MSA, p. 17). In addition, portion of the Moses Inventoried Roadless Area would be recommended to include in the Wilderness System (MSA 1990, p. 70). Alternative E includes multiple tools for decreasing fuel buildups and reducing the risk of uncharacteristically large-scale wildfire, which may threaten the objects of interest.

Promotion of Resiliency

Alternative E is expected to promote resilient vegetation communities through the use of mechanical treatment, prescribed fire, and managed wildfire (when available), in order of priority. Vegetation management for ecological restoration and maintenance would consider using mechanical treatment first, to prepare for the use of fire, and be focused first in the WUI defense and threat zones. Diameter limits are set in the WUI zones, in the Spotted Owl Habitat Areas (SOHAs), and for giant sequoias throughout the Monument.

Promotion of Heterogeneity

Alternative E was designed to improve heterogeneity through the use of multiple tools for ecological restoration and maintenance. It would use these tools to reduce fuels, encourage natural regeneration, and increase the diversity in species composition and age.

Recreation Opportunities

Alternative E would continue to provide current recreation opportunities, with a focus on the development of new recreation facilities or opportunities. Alternative E includes vegetation management for old growth values in SOHAs, riparian zones, wilderness, giant sequoia groves, and other areas for wildlife and visual values (MSA, p. 51).

Vegetation, Including Giant Sequoia Groves

The 1988 Forest Plan was designed to manage the majority of the forest for timber production (no longer applicable per the Clinton proclamation and 2001 SNFPA) and recreation use. The 1988 Forest Plan and subsequent 1990 MSA contained no diameter limits for tree felling or removal, except for giant sequoias. For Alternative E, vegetation management direction would be shifted for Management Area "Conifer Forest (CF)" and the associated Management Emphasis "7 (emphasize production of sawtimber volume in conifer)" that covers much of the Monument. Prescription CF7 from the 1988 Forest Plan focuses on commercial forestry based on allowable sale quantity. Since the Clinton proclamation prohibits this type of commercial forestry in the Monument, this timber portion of Prescription CF7 is no longer applicable.

For Alternative E, ecological restoration of forested ecosystems would be accomplished by reducing fuels, improving stand resilience and health, promoting heterogeneity, and encouraging natural regeneration of giant sequoias and other species. In areas where natural regeneration is not likely, planting would occur. Resiliency would be promoted by using mechanical treatment, prescribed fire, and managed wildfire (when available).

Fire and Fuels

For Alternative E, the WUI defense and threat zones are the only land allocations included from the 2001

SNFPA. The 1990 MSA did not address the need to protect the objects of interest and the urban interface from wildfire. Alternative E uses a WUI defense zone that extends approximately one-quarter mile out from developed private land, and a WUI threat zone that extends another one and one-quarter mile out from the defense zone. Designated WUI defense zones would cover 45,342 acres (13 percent of the Monument) and threat zones 145,522 acres (41 percent of the Monument).

Wildlife and Plant Habitat

Alternative E does not use the land allocations or associated standard and guidelines from the 2001 SNFPA for the SSFCA; RCAs; CARs; PACs for California spotted owls, northern goshawks, and great gray owls; or den site buffers for American marten and fisher. Alternative E would use the direction from the 1990 MSA to protect wildlife and plant habitat, including SOHAs.

Range

For Alternative E, grazing management would be directed by the 1988 Forest Plan and the 1990 MSA. Standards and guidelines from these documents do not contain specific guidelines for grazing within occupied little willow flycatcher or great gray owl habitat. Current range management practices would continue, including the Aquatic Management Strategy from the 2001 SNFPA. The allowable use factors from the 2001 SNFPA would not be used. They would be determined at the local level as described in the Forest Service Range Analysis Handbook.

Hydrological Resources

Alternative E includes the Riparian and Wetland standards and guidelines from the 1988 Forest Plan and the 1990 MSA. Standards and guidelines from the 2001 and 2004 SNFPAs, such as those for the Aquatic Management Strategy, RCAs, CARs, and RCOs, are not included.

Transportation

Under Alternative E, the majority of the currently designated road and trail system would be available for use, retaining access similar to current levels for dispersed recreation, private ownerships, and management activities. There would be the potential for some reduction in high-clearance vehicle roads over time.

OHVs would be allowed on designated roads. OSVs would be allowed on designated roads when covered with snow, unless specifically prohibited. Non-motorized mechanized vehicles (mountain bikes) would be allowed on designated roads and trails unless specifically prohibited. Alternative E emphasizes opportunities for creating loop trails and roads, and could include the construction of new roads for developed recreation facilities and loop driving opportunities. Decommissioned roads could be converted to trails.

Alternative F

Alternative F is designed to allow more flexibility in treatment methods to promote ecological restoration and maintenance, and forest health, and achieve the desired conditions in less time. Alternative F includes strategies that are responsive to the issues of recreation and public use, tree removal, fuels management/community protection, fires spreading to tribal lands, and methods for giant sequoia regeneration. It is similar to Alternative B, but proposes upper diameter limits for only giant sequoias.

Protection of Objects of Interest

Alternative F would retain the land allocations and standards and guidelines from the 2001 SNFPA, except where noted. Diameter limits in California spotted owl and northern goshawk PACs would be removed. For Alternative F, the Freeman Creek Grove would be designated as a botanical area, as prescribed by the 1990 MSA (MSA, p. 17). Alternative F includes multiple tools for decreasing fuel buildups and reducing the risk of uncharacteristically large-scale wildfire, which may threaten the objects of interest.

Promotion of Resiliency

Alternative F is expected to promote resilient vegetation communities through the use of prescribed fire, mechanical treatment, and managed wildfire (when available), with priorities and combinations determined by site-specific project analysis. It would allow flexibility in treatments where clearly needed for ecological restoration and maintenance or public safety, focusing first on the WUI defense and threat zones. It includes diameter limits only for giant sequoias.

Promotion of Heterogeneity

Alternative F was designed to improve heterogeneity through the use of multiple tools for ecological restoration and maintenance. It would use these tools to reduce fuels, encourage natural regeneration, and increase the diversity in species composition and age.

Recreation Opportunities

Alternative F would continue to provide current recreation opportunities, with a focus on the development of new recreation facilities or opportunities as visitor use increases.

Vegetation, Including Giant Sequoia Groves

For Alternative F, ecological restoration of forested ecosystems would be accomplished by reducing fuels, improving stand resilience and health, promoting heterogeneity, and encouraging natural regeneration of giant sequoias and other species. In areas where natural regeneration is not likely, planting would be used. Resiliency would be improved by using a combination of fire and mechanical treatments determined by site-specific analysis.

Alternative F would eliminate the standard and guideline from the 2001 SNFPA requiring retention of all conifer trees with a dbh of 30 inches or greater and hardwoods with a dbh of 12 inches or larger when implementing vegetation and fuels treatments.

Fire and Fuels

Alternative F uses a WUI defense zone that extends approximately one-quarter mile from developed private land and a WUI threat zone that extends another one and one-quarter mile from the defense zone. The actual boundaries of the WUI are determined locally, based on the distribution of structures and communities adjacent to or intermixed with national forest lands. Strategic landscape features such as roads, changes in fuel types, and topography are used in delineating the physical boundary of the WUI. In Alternative F, WUI defense zones would cover 45,342 acres (13 percent of the Monument) and threat zones 145,522 acres (41 percent of the Monument).

Alternative F includes the 56,591-acre TFETA. This land allocation was designed along the boundary with the Tule River Indian Reservation to not only protect the reservation and its watersheds, but also the objects of interest and watersheds in the Monument, from fires spreading from one to the other.

Wildlife and Plant Habitat

Alternative F would replace the 2001 SNFPA standards and guidelines for great gray owl and little willow flycatcher habitat with standards based on the 2004 SNFPA. The 2004 SNFPA includes management direction for these species that is adaptable to local site conditions, while carrying forward the protection measures set in place by the 2001 SNFPA. Diameter limits in California spotted owl and northern goshawk PACs would be removed.

Range

For Alternative F, standards and guidelines for livestock grazing from the 2004 SNFPA would replace the 2001 SNFPA direction. Some management direction from the 1988 Forest Plan and 1990 MSA would be used.

Hydrological Resources

Alternative F would replace the strategies, objectives, and standards and guidelines for the RCOs from the 2001 SNFPA with management direction based on the 2004 SNFPA. The 2004 SNFPA reduces redundancy and describes more consistent direction for hydrological resources, while maintaining the intent of the Aquatic Management Strategy.

Transportation

For Alternative F, the majority of the currently designated road and trail system would be available for use, retaining access similar to current levels for dispersed recreation, private ownerships, and management activities. There would be the potential for some reduction in high-clearance vehicle roads over time.

OHVs would be allowed on designated roads. OSVs would be allowed on designated roads when covered with snow, unless specifically prohibited. Non-motorized mechanized vehicles (mountain bikes) would be allowed on designated roads and trails unless specifically prohibited. Alternative F emphasizes opportunities for creating loop trails and roads, with the potential for the construction of new

roads for developed recreation facilities and loop driving opportunities. Decommissioned roads could be converted to trails.

Affected Environment

Location

The Monument includes approximately 327,000 acres of National Forest system lands (encompasses 354,000 acres including private land) located in the southern Sierra Nevada on the Sequoia National Forest, in Fresno and Tulare Counties and a small portion of Kern County, California. The Monument is situated approximately 37 miles south of Yosemite National Park, directly west and south of Sequoia and Kings Canyon National Parks, approximately 45 miles east of Fresno and 20 miles east of Porterville. Approximate Universal Transverse Mercator (UTM) coordinates for the northern section are zone 11, 0346900E, 4075500N, 0321600E, 4057750N and 4007850N, 3955900N, 0370000E, 0348000E for the southern section.

General Habitat Discussion

The Monument is located along the west slope of the southern Sierra Nevada. Elevations in the Monument range from approximately 1,000 to over 10,000 feet. Habitat types within the Monument include: mixed conifer (including giant sequoia groves), red fir, oak woodland, montane and mixed chaparral, wet meadow, riparian, annual grassland and rock outcrop.

Red fir forests in the Monument are dominated by red fir (*Abies magnifica*), interspersed with lodgepole pine (*Pinus contorta*) and some areas of western white pine (*Pinus monticola*). Above 10,000 feet, alpine and subalpine vegetation dominate.

Mixed-conifer forests contains a mixture of two or more dominant conifer species, including giant sequoia (*Sequoiadendron giganteum*), ponderosa pine (*Pinus ponderosa*), Jeffrey pine (*Pinus jeffreyi*), white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), and sugar pine (*Pinus lambertiana*) with a complex understory of *Arctostaphylos*, *Ceanothus*, and other shrubs. This is the most common habitat type in the Monument.

Oak woodlands include blue oak (blue oak savanna) (*Quercus douglasii*) with a chaparral and annual grass understory, canyon live oak (*Quercus chrysolepis*) and at higher elevations, mixed conifer/oak woodlands with black oak (*Quercus kelloggii*).

Montane and mixed chaparral habitats are found in patches throughout the Monument. These are shrub communities dominated at lower elevations by buckbrush (*Ceanothus cuneatus*), birchleaf mountain mahogany (*Cercocarpus betuloide*s), poison oak (*Toxicodendron diversilobum*) and at higher elevations by mountain whitethorn (*Ceanothus cordulatus*), deerbrush (*C. integerimus*), chinquapin (*Castinopsis sempervirens*), and greenleaf manzanita (*Arctostaphylos patula*).

Wet meadows are wetland habitats associated with groundwater seeps and margins of seasonal drainages. This plant community is dominated by grass and grass-like species growing with varying combinations of herbaceous perennials. Riparian habitat is associated with the margins of seasonal and perennial drainages, and with seeps and wet meadow margins at scattered locations in the Monument. Riparian habitat is dominated by willows including Lemmon's willow (*Salix lemmonii*), Sierra willow (*S. eastwoodii*), and Scouler's willow (*S. scouleriana*), with occasional quaking aspen (*Populus tremuloides*) and mountain alder (*Alnus incana spp. tenuifolia*).

Annual grasslands are found throughout the lower elevations of the Monument. The areas are dominated by species such as bromes (*Bromus spp.*), needlegrass (*Achnatherum spp*.) and wild oats (*Avena spp.*). Dominant forbs in annual grasslands include owl's clover (*Orthocarpus spp.*), fiddleneck (*Amsinckia intermedia*) and stork's bill (*Erodium spp*). These grasses and forbs may occur in pure stands or contain an overstory of scattered oaks (*Quercus spp.*) or California buckeye (*Aesculus californica*).

The rock outcrop, talus, and rock scree plant community is located along the upper slopes and along ridges. A variety of forbs occur in these sparsely vegetated habitats, but some places are entirely devoid of vegetation.

Environmental Effects

Legal and Regulatory Compliance

Compliance with Forest Plan and Other Direction

	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Guidance from the 1988 Sequoia National Forest LMRP						
Protect fisheries and wildlife through compliance with Sequoia National Forest riparian and meadow guidelines.	X	X	X	X	X	X
Management of California condors is to be congruent with the California Condor Recovery Plan.	X	X	X	X	X	X
Guidance from the 2001 Sierra Nevada Forest Plan Amendment						
Forest carnivores (den site buffers, limited operating periods, vegetation management restrictions, etc.)	X	X		X		X
California spotted owls and northern goshawks (PACs, limited operating periods, vegetation management restrictions, etc.)	X	X		X		X
Great gray owls (PACs, limited operating periods, grazing restrictions, etc.)	X	*		*		*
Little willow flycatchers (survey requirements, grazing restrictions, etc.)	X	*		*		*
Snags and down woody material	X	X	X	X		X
Old forest habitat (connectivity, etc.)	X	X	X	X		X
Large tree retention	X	X	X	X		
X= complies with 1988 Forest Plan or 2001 SNFPA guidelines *= follows 2004 SNFPA guidelines						

All of the alternatives comply with the applicable wildlife-related guidelines in the Forest Plan (USDA 1988). Alternatives A, B, and D comply with the applicable wildlife-related guidelines in the 2001 or 2004 SNFPA (USDA 2001, 2004). There are no land allocation based guidelines in Alternative C, but many of the wildlife related guidelines are similar to the 2001 SNFPA. Surveys and LOPs would be utilized as needed.

Alternative E fails to meet many of the applicable guidelines because it does not incorporate 2001 or 2004 SNFPA guidelines for wildlife. Alternative F would eliminate the standard and guideline from the 2001 SNFPA requiring retention of all conifer trees with a dbh of 30 inches or greater and hardwoods with a dbh of 12 inches or larger when implementing vegetation and fuels treatments. Diameter limits in California spotted owl and northern goshawk PACs would also be removed.

Analysis Assumptions and Methodology

Assumptions

Ecological Restoration and Wildlife

Ecological restoration for wildlife is defined as a reestablishment of natural functions and processes in the Monument that provide a diverse range of high quality habitats. Priority areas for restoration are those sites which were modified from their natural state by

fire suppression, logging, unmanaged grazing, adverse changes in hydrology and historic development. The goal of management of wildlife habitat is to return human-disturbed areas to the natural conditions and processes characteristic of the ecological zone in which the damaged resources are situated. Ultimately, restored areas would be maintained as valuable wildlife habitat through natural processes, with little human management required. These restored areas could then contribute to the maintenance of viable populations of animal species in the Monument.

Restoration efforts may include, for example:

- Return of a natural fire regime
- Removal of exotic species
- Restoration of abandoned unneeded roads, areas over-grazed by domestic animals, or disrupted natural waterways
- Restoration of areas disturbed by management activities or by public use (such as construction or OHV damage)
- Restoration of native plants and animals

Throughout the Monument, even in the WUI zones and the TFETA, mechanical treatments will be limited or prohibited in wilderness (existing or proposed), in wild and scenic river corridors, in inventoried roadless areas, in research natural areas, in riparian conservation areas, on slopes exceeding 35 percent, in areas greater than 9,000 feet in elevation, and in areas more than one quarter mile from a road, with the exception of hazard trees. Based on these constraints, approximately 23 percent of the 328,315 acres in the Monument could be considered for mechanical treatment (alone or in conjunction with fire), compared to about 77 percent that could be considered for fire treatments.

Assumptions for All Alternatives

All of the alternatives would allow short-term reductions in habitat quality (by removing trees, snags and down woody material) for some species and create potential disturbance to individual animals. In the long-term, vegetation treatments may reduce the frequency and scale of uncharacteristically severe wildfire in the Monument and improve resiliency to drought, insects and disease.

Assumptions for Alternative A

There are a number of ongoing activities in Alternative A (No Action) that have the potential to impact wildlife. These activities would continue in the action alternatives. They include:

- Meadow restoration
- Trail and road maintenance
- Use of designated roads and trails (with some differences in the available routes by alternative)
- Vegetation treatments, including thinning, fuels, and planting
- Prescribed burning and managed wildfire
- Water improvement projects
- Campground and administrative site operations and maintenance
- Hazard tree removal
- Livestock grazing on designated allotments
- Recreational use of caves
- Rock climbing
- Special use permits
- Hunting and fishing
- Science and research
- Winter sports, including snowmobiles

Methodology

Scientific Advisory Board (SAB) Advisories

The SAB recommended:

> The Monument should closely follow current and future research on the relationships between LS/OG-correlated species, and stand-structure modification as well as grazing. Direct monitoring of sensitive LS/OG species, not merely monitoring of habitat, is called for until habitat/species relationships are better understood. The California Wildlife Habitat Relationships System (California Dept. of Fish and Game 2000), however imperfect, is presently the most powerful tool available for predicting which species will be advantaged and which species disadvantaged when habitats are changed in specific ways. Assuming that stand

modification through burning or mechanical thinning is detrimental to some of these vertebrate species, science cannot say whether long-term forest health or short-term conservative protection of LS/OG-dependent vertebrates is the correct choice (Scientific Advisory Board 2003).

A great deal of knowledge of fisher's use of habitat has been gained since the SAB recommendations in 2003. While monitoring all of the Monument's sensitive species would be a great help to management, it would also be cost prohibitive. Therefore, monitoring would be limited to project-level surveys and some limited annual monitoring of fisher, California spotted owls, northern goshawks, great gray owls, and little willow flycatchers would continue in all alternatives of the Monument Plan FEIS.

Determining Direct and Indirect Effects

This is a programmatic level FEIS with no proposed ground disturbing activities and therefore, no direct effects.

Indirect effects of the six alternatives in the Monument Plan FEIS were evaluated using three primary metrics:

1. **Vegetation Management:** Vegetation management projects for fuels reduction and ecological restoration may affect habitat important to a particular species.
2. **Recreation Impacts:** Roads, trails, and recreation sites may affect the quality of habitat through disturbance, fragmentation, or the loss of key habitat features.
3. **Special Management Areas:** In some alternatives, special management areas or land allocations are utilized to protect habitat features important to sensitive species.

Note: The number of acres and miles of roads reported in this effects analysis for wildlife habitat were derived from a GIS analysis and are based on totals inside the Monument boundary. There was no distinction made between public, private, or state-owned land inside the Monument boundary, which may differ from other analyses in this Monument Plan FEIS. Numbers reported in the BE are based on conditions existing in June 2011.

Large stand-replacing fires have the potential to affect habitat suitability for a number of wildlife species. The location and extent of large wildfires are impossible to accurately predict. Modeling of the alternatives estimated that stand-replacing fire would occur on a maximum of four percent of forested land in the Monument per decade in the next 30 years (SPECTRUM model). While these fires may drastically change habitat in limited areas, the effects would only affect a small portion of habitat Monument-wide. These changes may improve habitat function for some species while degrading or otherwise limiting abundance and distribution of habitat for others.

Determining Cumulative Effects

The cumulative effects analysis evaluates the six alternatives in context with past, present, and reasonably foreseeable actions that when taken collectively might negatively influence the species. The cumulative effects of past management activities are incorporated within the existing condition in the Monument. The Forest Service recognizes that significant scientific advances in evaluating landscape conditions have been made in the past decade and will employ improved cumulative effects analysis techniques as they become available. For example, Forest Inventory and Analysis plots may provide reference points of forest conditions over time, and landscape trajectory analyses can be used to evaluate trends in habitat quality without requiring detailed analysis of past actions. Where appropriate and based on available data, this cumulative effects analysis for site-specific projects will consider whether proposals exacerbate or moderate habitat trends. The analysis areas vary by species.

Climate change will cause changes in the distribution of individual species and of forest and rangeland ecosystems. The precise effects of climate change on individual species are difficult to predict and will not be addressed in the effects analysis. For a more detailed description of how climate change may affect the Monument, see the Trends in Climate Change section in Volume 2, Appendix C of the Monument Plan FEIS.

Northern Goshawk–Effects

Northern Goshawk (*Accipiter gentilis*)

Habitat Preferences and Biology

Preferred habitat consists of older-age coniferous, mixed, and deciduous forest habitat. The habitat is also composed of large trees for nesting, a closed canopy for protection and thermal cover, and open spaces allowing maneuverability below the canopy (Hargis et al. 1994, Squires and Kennedy 2006). Snags, downed logs, and high canopy cover appear to be preferred habitat features although many east side Sierran territories are relatively open and have fewer snags. Snags and down logs are an important component used by numerous prey species. In addition, many of the species that provide the prey base for northern goshawks are associated with open stands of trees or natural openings containing an understory of native shrubs and grass (Fowler 1988). Northern goshawk demography is strongly influenced by prey availability (Squires and Kennedy 2006).

Northern goshawk nesting habitat is characterized by dense canopy closure (50 to 90 percent) in mature forest with open flight paths under the canopy (McGrath et al. 2003). Nest trees for this species are commonly located on benches or basins surrounded by much steeper slopes (Hargis et al. 1994). Mature trees serve as nest and perch sites, while plucking posts are frequently located in denser portions of the secondary canopy. The same nest may be used for several seasons, but alternate nests are common within a single territory. The chronology of nesting activity varies annually and by elevation. In general, nesting activities are initiated in February with nest construction, egg laying, and incubation occurring through May and June (Dewey et al. 2003). Young birds hatch and begin fledging in late June and early July and are independent by mid-September.

Habitat models based on best professional opinion contained in the California Wildlife Habitat Relationships (CWHR) database rate the following vegetation types and strata as providing high nesting and feeding habitat capability for northern goshawks: structure classes 4M, 4D, 5M, 5D and 6 in Sierran mixed conifer, white fir, ponderosa pine, montane hardwood-conifer, montane riparian, red fir, Jeffrey pine, lodgepole pine, subalpine conifer, and montane hardwood (CWHR 2005). CWHR assigns habitat values according to expert panel ratings. Using the CWHR model, there are 208,590 acres of moderate and high suitability nesting and foraging habitat for northern goshawks in the Monument. Known nest sites within the Monument are associated with these forest cover types.

Historic and Current Distribution

Sequoia National Forest has conducted surveys for nesting northern goshawks intermittently in relation to projects or based on reported sightings for at least two decades in portions of the Monument. Fourteen territories have been identified based on nest location or location of an adult and juvenile. It is likely that there are many more territories that have not been located. Surveys of areas with active management will continue following Regional protocol and management direction.

Risk Factors

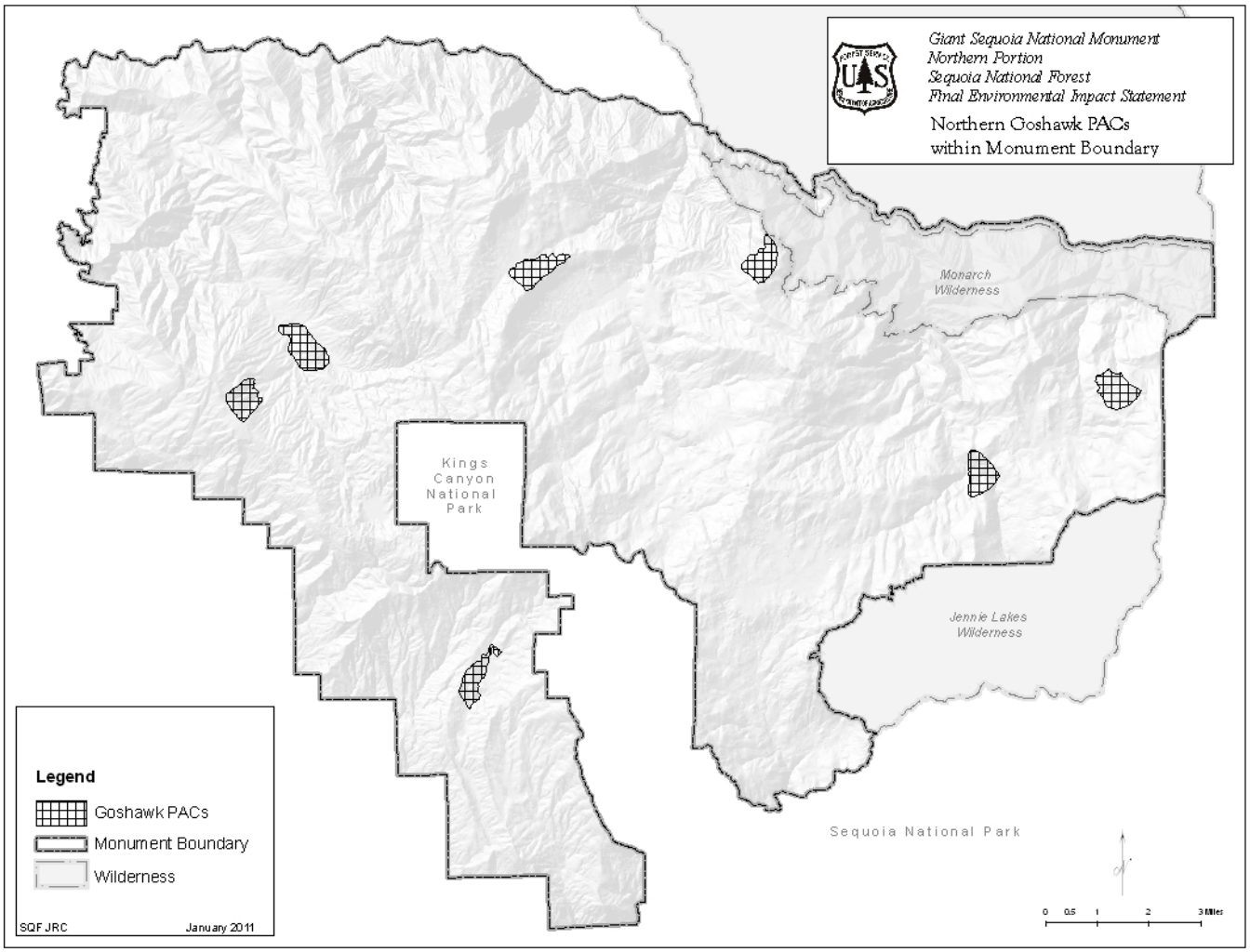
Collection, habitat loss or fragmentation, disturbance at a specific site, and edge effects were described by Gaines et al. (2003) as factors that potentially affect northern goshawks.

Human disturbance has the potential to cause northern goshawks to abandon nest sites during the nesting (Boal and Mannan 1994) and post fledging period (February 15 through September 15). Response to these disturbances can be quite variable and dependent on the individuals occupying the site. Northern goshawks initiate breeding when the ground is still covered in snow and sometimes nests are located along roads and trails when they are not yet in use. Additionally, roads and trails provide flight access for northern goshawks. When the snow melts, these sites can potentially be areas of conflict as these roads and trails are used by people (USDA 2001).

Management

Management direction in the 2001 SNFPA for northern goshawks includes delineating a 200-acre PAC around the most recent nest site and alternate nest sites containing the best available suitable forested habitat in the largest contiguous patch as possible (USDA 2001). An LOP of February 15 through September 15 for activities within one-quarter mile of the nest site may be required if documented

Map 5



disturbance to nesting activities is occurring (USDA 2001). Suitable habitat must be surveyed prior to land disturbance. There are currently 14 designated northern goshawk PACs within the Monument (Maps 5 and 6). The California Department of Fish and Game has designated northern goshawks as a California species of special concern.

Effects

Direct Effects

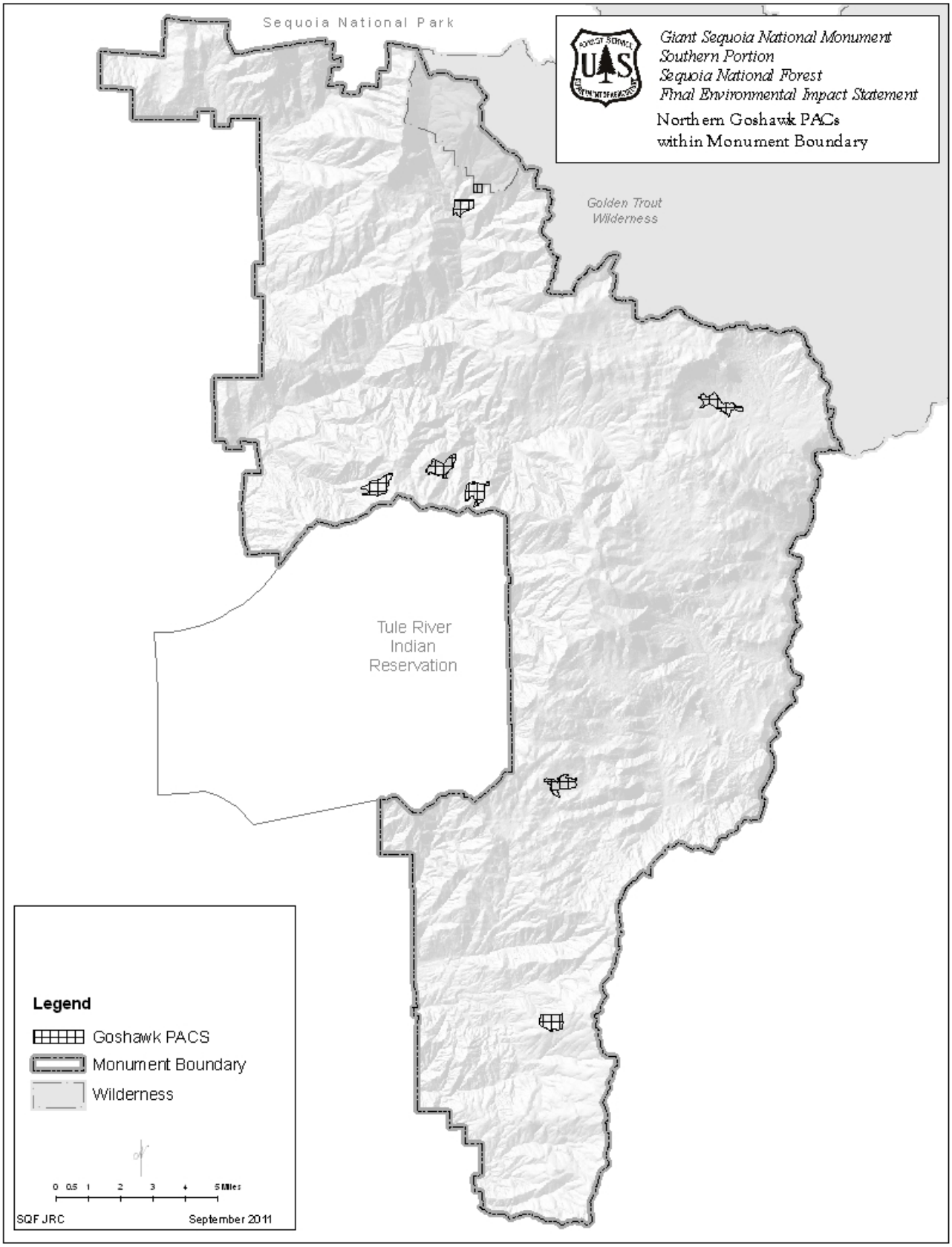
This is a programmatic level FEIS with no proposed ground disturbing activities and, therefore, no direct effects.

Indirect Effects

1. Vegetation Management: Vegetation management projects for fuels reduction and ecological restoration may affect northern goshawk habitat by reducing canopy cover and removing key habitat features (large trees, snags, down woody debris). All of the alternatives would follow management direction to set the highest priority for fuels reduction activities in the WUI.

Alternative A (No Action)—Alternative A would continue the existing direction in the 2001 SNFPA to locate fuels treatments across broad landscapes, in order to reduce the spread and intensity of fires. Of the 208,590 total acres identified as suitable northern goshawk habitat (using CWHR model), there are 25,551 acres within the WUI defense zone (12 percent of the goshawk habitat in the Monument) and 83,935 acres within the WUI threat zone (40 percent of the goshawk habitat in the Monument). These areas have the highest priority for fuels treatments and have less stringent requirements for maintaining habitat features

Map 6


Sequoia National Park
Giant Sequoia National Monument
Southern Portion
Sequoia National Forest
Final Environmental Impact Statement
Northern Goshawk PACs
within Monument Boundary
Golden Trout
Wilderness
Tule River
Indian
Reservation
Legend
Goshawk PACS
Monument Boundary
Wilderness
0 0.5 1 2 3 4 5 Miles
SQF JRC
September 2011

important to northern goshawks than areas outside of WUIs.

Alternative B—WUIs would be the same acreage as in Alternative A. In addition, the TFETA which includes 33,609 acres of northern goshawk habitat would be established along the border with the Tule River Reservation. This would place an additional 18,307 acres of northern goshawk habitat that is not already in WUI, in a priority area for fuels reduction. The short-term loss of habitat features important to northern goshawks would likely be higher in Alternative B than in Alternatives A, C, D, and E. In Alternative B, 64 percent of goshawk habitat in the Monument would be in one of the priority areas for fuels reduction.

Alternative C—Alternative C would designate a WUI defense zone that extends approximately 300 feet from structures, developed recreation sites, and administrative sites. Approximately 4,859 acres or two percent of the northern goshawk habitat in the Monument would be within WUI defense zones. Assuming that fuels treatments would be concentrated in the WUIs, the short-term loss of habitat features important to northern goshawks would be lower in Alternative C than in Alternatives A, B, E, and F.

Alternative D—In Alternative D, areas designated as WUIs would be smaller than in the other alternatives. The defense zone would be 200 feet from structures on National Forest System land or from the boundary with private land, unless topographic circumstances dictate otherwise. In Alternative D, approximately 2,609 acres or one percent of the northern goshawk habitat in the Monument would be in the designated WUI defense zone. The number of proposed acres that would likely be treated in Alternative D is small compared to those that would likely be treated under the other alternatives. Therefore, the potential for short-term loss of habitat features important to northern goshawks would likely be the lowest in Alternative D.

Alternative E—The designated WUIs and fuels treatment strategy would be the same as in Alternative A. Therefore, the effects on northern goshawk habitat are expected to be the same.

Alternative F—Alternative F would continue existing management direction to make fuels reduction activities in the current WUIs the highest priority. The size of the WUI defense and threat zones would be the same as in Alternatives A, B, and E. In addition the TFETA would be established. Alternative F would eliminate the standard and guideline from the 2001 SNFPA requiring retention of all conifer trees with a dbh of 30 inches or greater when implementing vegetation treatments. There would be a six-inch diameter limit within one to two acres of a nest tree for the northern goshawk. There would be no diameter limit for the rest of the acreage in a northern goshawk PAC. The short-term loss of habitat features important to northern goshawks would be higher in Alternative F than in the other alternatives due to the lack of diameter limits on tree felling. The long-term resiliency of northern goshawk habitat to stand-replacing events such as fire, insects, and disease may be improved following treatments for ecological restoration.

2. Recreation Impacts: Human disturbance has the potential to cause northern goshawks to abandon their nests during the nesting and post fledging period (February 15 through September 15). Northern goshawks initiate breeding when the ground is still covered in snow and sometimes nests are located along roads and trails when they are not yet in use or near developed recreation sites like campgrounds. Additionally, roads and trails provide flight access for northern goshawks. When the snow melts, these sites can potentially be areas of conflict because these roads and trails are used by people. Joslin and Youmans (1999) recommend maintaining low road densities to minimize disturbance to northern goshawks. Developed recreation sites, as well as roads and trails, can fragment northern goshawk habitat by reducing canopy closure (Beir and Drennan 1997, Daw and DeStefano 2001) and by reducing forest interior patch size. Also, snag removal for safety would be more concentrated around designated campgrounds and recreation sites.

Alternatives A, B, E, and F—Approximately 1,095 miles of roads and 202 miles of trails would continue to be utilized for recreation in Alternatives A, B, E, and F. Developed recreation sites would cover about 660 acres and dispersed camping would be permitted. OHV use is allowed on designated roads only.

Alternative C—Recreation opportunities in developed sites would be emphasized and increased.

Dispersed camping outside of developed sites would be eliminated. Camping in more remote locations, in designated roadless areas, or in the Wildlands recreation niche setting would be allowed by permit. Motorized vehicle traffic would be limited to street licensed vehicles only. Snowmobile use would be eliminated for the public, except to access private property, and otherwise only allowed for administrative reasons or emergency situations.

The risk of disturbance to northern goshawks and habitat fragmentation would be concentrated at the developed recreation sites. Overall effects to northern goshawks would be lower than in the other alternatives because of the elimination of dispersed camping and the restriction on type of motorized vehicle use. Fewer acres of potential northern goshawk habitat would be subjected to disturbance, habitat fragmentation, and hazard tree/snag removal.

Alternative D—Recreation would be managed similarly to Alternatives A, B, E, and F except new recreation development would be limited, motorized use would be restricted to street-legal vehicles only and OSVs would be limited to paved roads.

The risk of disturbance to northern goshawks and habitat fragmentation would be less than Alternatives A, B, E, and F because of the restrictions on vehicle types. The overall acres of northern goshawk habitat subject to disturbance would be more than Alternative C but disturbance at specific developed recreation sites would likely be lower.

3. Special Management Areas: Northern goshawk PACs are specific land allocations established to preserve key habitat characteristics and restrict project related disturbance with LOPs. Several other land allocations, although not specifically aimed at protecting northern goshawks, also protect goshawk habitat by maintaining canopy cover, large trees and down woody debris. These areas include: California spotted owl PACs, fisher and American marten den site buffers, RCAs, CARs, old forest emphasis areas, and the SSFCA.

Alternatives A and B—Alternatives A and B would maintain the 14 current northern goshawk PACs and restrict management activities on 3,200 acres of high quality habitat. An LOP from February 15 to September 15 for activities within one-quarter mile of the nest site would be required for most management activities.

In northern goshawk PACs outside of WUI defense zones (2,801 acres or 88 percent of PAC acres), fuels treatment would be limited to prescribed fire. Prior to burning, hand thinning of trees less than six inches within a one to two acre area around the nest tree would be permitted. These restrictions would also apply to areas where a northern goshawk PAC overlaps with WUI threat zone or the TFETA (in Alternative B).

For northern goshawk PACs within the WUI defense zones (399 acres or 12 percent of PAC acres), mechanical treatments would be prohibited within a 500-foot radius buffer around nest trees. Prescribed burning would be allowed within the 500-foot buffer. Prior to burning, managers could conduct hand treatments, including the felling of small trees, within the one to two acre area surrounding nest trees. The remaining area of the PAC could be mechanically treated to meet desired fuels reduction goals.

Habitat characteristics important to northern goshawks would also be protected in California spotted owl PACs (22,651 acres), fisher den site buffers (2,965 acres), American marten den site buffers (109 acres), RCAs, CARs (27,147 acres), old forest emphasis areas (160,607 acres), and the SSFCA (333,542 acres). Each of these land allocations has unique standards and guidelines which vary in the level of protection they provide for northern goshawk habitat (see wildlife standards and guidelines).

Alternative C—Alternative C would not include northern goshawk PACs or other wildlife protection land allocations. In Alternative C, additional site-specific evaluations of potential impacts from fuels reduction or other activities would occur during project planning. LOPs appropriate for northern goshawks would be utilized as needed.

Although there is no specific land allocation for the protection of northern goshawks in Alternative C, management activities with the potential to negatively affect goshawks or their habitat are limited. WUI areas, where fuels reduction treatments will be focused, are smaller than in Alternatives A, B, E, and F, and the number of acres expected to be treated is small, compared to Alternatives A, B, E, and F.

Alternative D—Alternative D would maintain the 14 current northern goshawk PACs and restrict management activities on 3,200 acres of high quality habitat. It would also maintain California spotted owl PACs, fisher and American marten den site buffers, RCAs, and CARs. In Alternative D, the land allocations of SSFCA and old forest emphasis would be eliminated. Instead the entire Monument would be managed for wildlife, with particular emphasis on old forest dependent species.

Alternative D does not allow tree felling for fuels management or ecological restoration, only for safety concerns. The WUI area is less than the other alternatives and the number of acres expected for fuels treatment is smaller than the other alternatives. Therefore, the short-term effects on northern goshawks and their habitat are smaller in Alternative D than the other alternatives.

Alternative E—There would be no northern goshawk PACs or other land allocations specifically protecting goshawk habitat in Alternative E. SOHAs on 24,707 acres would be maintained. However, SOHAs only restrict timber harvest from areas, which is not a management option due to the Clinton proclamation (2000). Alternative E requires project level surveys for active northern goshawk nests, LOPs from April 1 to August 1, and the evaluation of projects with a BE.

Of the alternatives, Alternative E would allow the greatest amount of short-term northern goshawk habitat loss and disturbance due to the lack of protected areas and the shorter LOP.

Alternative F—Alternative F would maintain the 14 current northern goshawk PACs and require LOPs for management activities, but diameter limits for tree felling would be eliminated, except for the one to two acre area around the nest stand.

Other than Alternative E, Alternative F would allow the greatest amount of short-term northern goshawk habitat loss due to the potential for large tree removal in ecological restoration projects.

Cumulative Effects

The cumulative effects analysis area for northern goshawks includes the southern Sierra Nevada from the Kings River to the Breckenridge Mountains at the southern edge of Sequoia National Forest and east to the Kern Plateau. This includes the Tule River Indian Reservation and portions of Sequoia and Kings Canyon National Parks. This area extends outside the Monument due to large home range/territory size and potential to impact territories of northern goshawks nesting outside the Monument boundary. The cumulative effects time frame is the same as the other species analyzed in this document—20 years into the future. The cumulative effects of all past actions are incorporated into the existing condition.

Vegetation Management—Fuels reduction treatments that may impact northern goshawk habitat are currently occurring and would continue to occur throughout the analysis area. These treatments are generally focused near communities and other developed areas. Prescribed fire is a tool expected to be used throughout the area, with mechanical and hand thinning also occurring. The number of acres of northern goshawk habitat likely to be impacted in the analysis area is small, given the constraints on treatments (funding, air quality, etc.).

Recreation Impacts—The Greenhorn Mountain and Breckenridge areas of Sequoia National Forest completed motorized travel route designation. As a result of this process, motorized cross-country travel will be prohibited and some user created routes in suitable northern goshawk habitat are being added to the National Forest Transportation System. Adverse impacts of motorized vehicles on northern goshawks in this area will be reduced due to the elimination of cross-country travel in this portion of the Forest (USDA 2009).

Overall recreation visits within the analysis area are expected to increase. Additional recreational use may increase the probability of disturbance to northern goshawks.

Wildfires—Large stand-replacing fires have the potential to make large areas of habitat unsuitable for northern goshawks by reducing canopy cover, decreasing prey abundance and killing nest and roost trees.

Determination

All Alternatives-—It is my determination that all of the alternatives ***may affect individuals***, but are not likely to result in a trend toward Federal listing or loss of viability of northern goshawks. In Alternative F,

there would be no diameter limits on trees removed for fuels reduction, ecological restoration, or safety hazards. Although unlikely, potential nest trees could be removed.

All of the alternatives would allow short-term reductions in habitat quality by removing trees, snags and down woody material, and there us a potential for disturbance to individuals, but only a small portion of the available habitat would be affected. Only 11 percent of suitable habitat for northern goshawks in the Monument is within WUI defense zones, which are the areas where vegetation treatments are most likely. Furthermore, modeling of old forest habitat in the Monument showed increasing trends in acres across all of the alternatives (SPECTRUM model).

Little Willow Flycatcher–Effects

Little Willow Flycatcher (*Empidonax trailii brewsterii*)

There are three subspecies of willow flycatchers in California. The "little" willow flycatcher, *Empidonax trailii brewsterii*, is considered the subspecies that was historically found in the Monument. All willow flycatcher subspecies are listed as endangered by the state of California.

The southwestern willow flycatcher (*Empidonax trailii extimus*) is covered in the Biological Assessment for the Monument Plan FEIS and consultation for the 2001 SNFPA.

Habitat Preferences and Biology

Little willow flycatchers are neotropical migrants which historically nested in meadows throughout the Sierras. Nesting habitat is generally willows or other shrubs either in montane meadows or other areas with riparian deciduous shrub zones. The little willow flycatcher nesting period in the Sierra Nevada generally extends from June 1 to August 31. A compilation of multiple years of Sierra-wide willow flycatcher nesting data determined that willow flycatchers fledge young between approximately July 15 and August 31 and fledglings remain in territories for two to three weeks post-fledging (Stafford and Valentine 1985, Sanders and Flett 1989, Matthewson 2006). Approximately 10 percent of the total successful nesting attempts occur between August 15 and August 30 (USDA 2004).

Long-term research shows that brown-headed cowbirds affect willow flycatcher populations within the Sierra Nevada bioregion (in particular, the southwestern willow flycatcher subspecies) (Sedgwick and Iko 1999, Whitfield 1990, Whitfield and Enos 1996, Whitfield and Sogge 1999). Although brown-headed cowbirds affected less than seven percent of observed willow flycatcher nests in the Sierra Nevada between 1997 and 2000, their influence could become greater if willow flycatcher populations decrease, brown-headed cowbird populations increase, or both occur (Whitfield and Sogge 1999). A study in the central Sierra in 2006 found cowbird parasitism rates of 23 percent (Mathewson et al. 2006). Because mountain communities are expanding in many areas, and brown-headed cowbirds are highly associated with human activities, brown-headed cowbirds may increase in at least some portions of the region (Verner and Ritter 1983).

Historic and Current Distribution

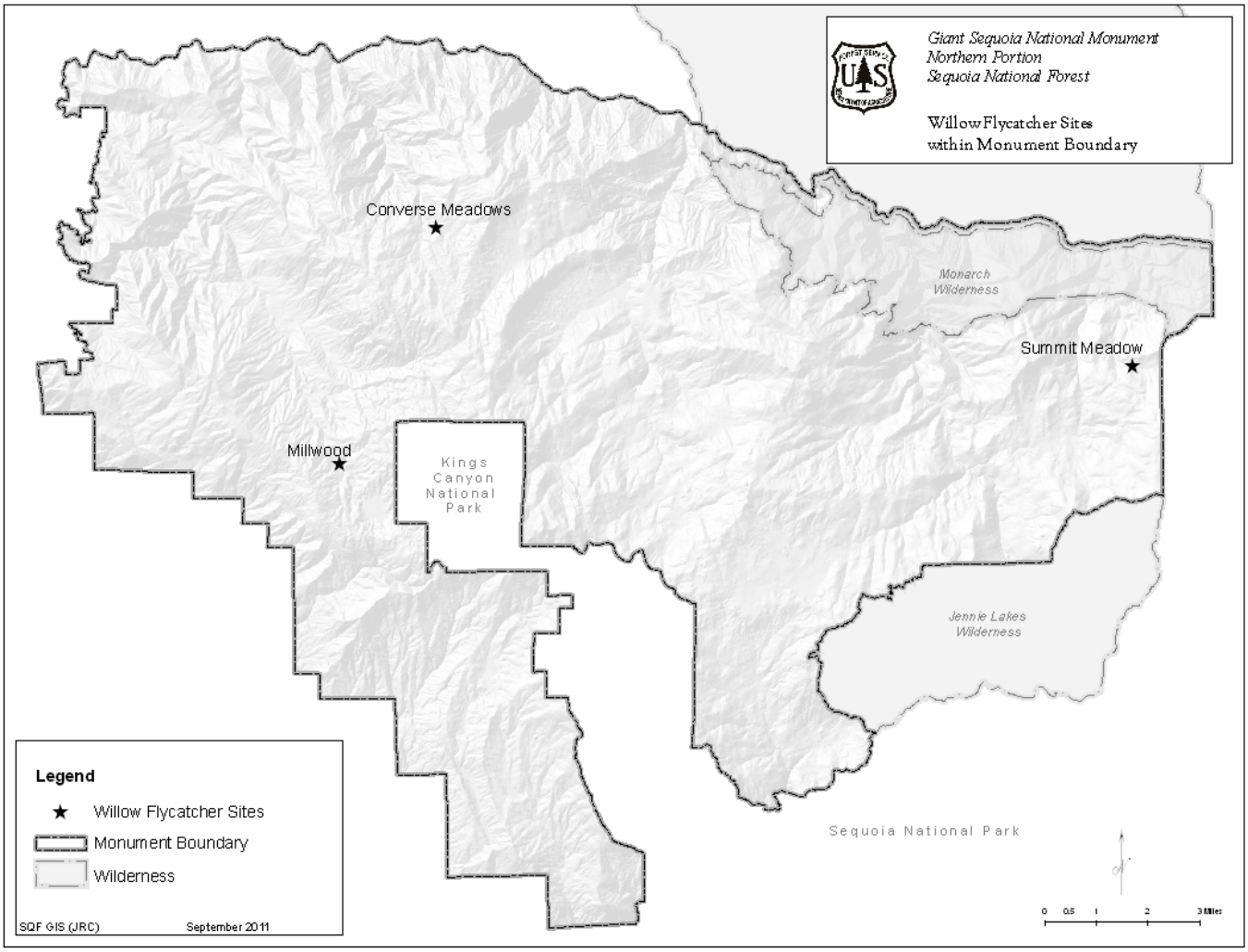
The willow flycatcher population in the Sierra Nevada declined substantially after 1940. When recent nesting site re-occupancy data and central Sierra Nevada nest success and fecundity rates are used as measures of population trend, the willow flycatcher population in the Sierra Nevada appears to have continued to decline (Morrison et al. 2000).

The SNFPA FEIS identified 82 sites as known little willow flycatcher sites on National Forest System lands. Since that time, it was discovered that one site (Sulfur Creek on the Sierra NF) that occurs on private land was mistakenly included in the total. The current number of known littlewillow flycatcher sites under the SNFPA ROD is 81 sites. Five of these sites are within the Monument at: Millwood, Converse Meadow, Summit Meadow, Crane Meadow and Holey Meadow (Maps 7 and 8). Since 2001, multiple surveys of these sites failed to detect occupancy by little willow flycatchers and it is likely this species has been extirpated from the Monument.

Risk Factors

For a summary of risk factors, see the SNFPA FEIS, Volume 3, Chapter 3, part 4.4, pages 152-162. The Conservation Assessment (Green et al.

Map 7



2003) discusses all of the risk factors and identifies additional risks of water development and pesticide drift from the Central Valley and pesticide use in Central and South American wintering grounds. Risk factors pertinent to the Monument are limited to grazing effects and cowbird parasitism. Management guidelines affecting these factors were set by the SNFPA and addressed in the FEIS.

Management and Status

The 2001 SNFPA is the current management direction. Known little willow flycatcher sites are surveyed at least every four years and suitable habitat is protected from adverse effects associated with management actions (grazing, fuels reduction, etc.). All willow flycatcher subspecies are listed as endangered by the state of California.

Effects

Direct Effects

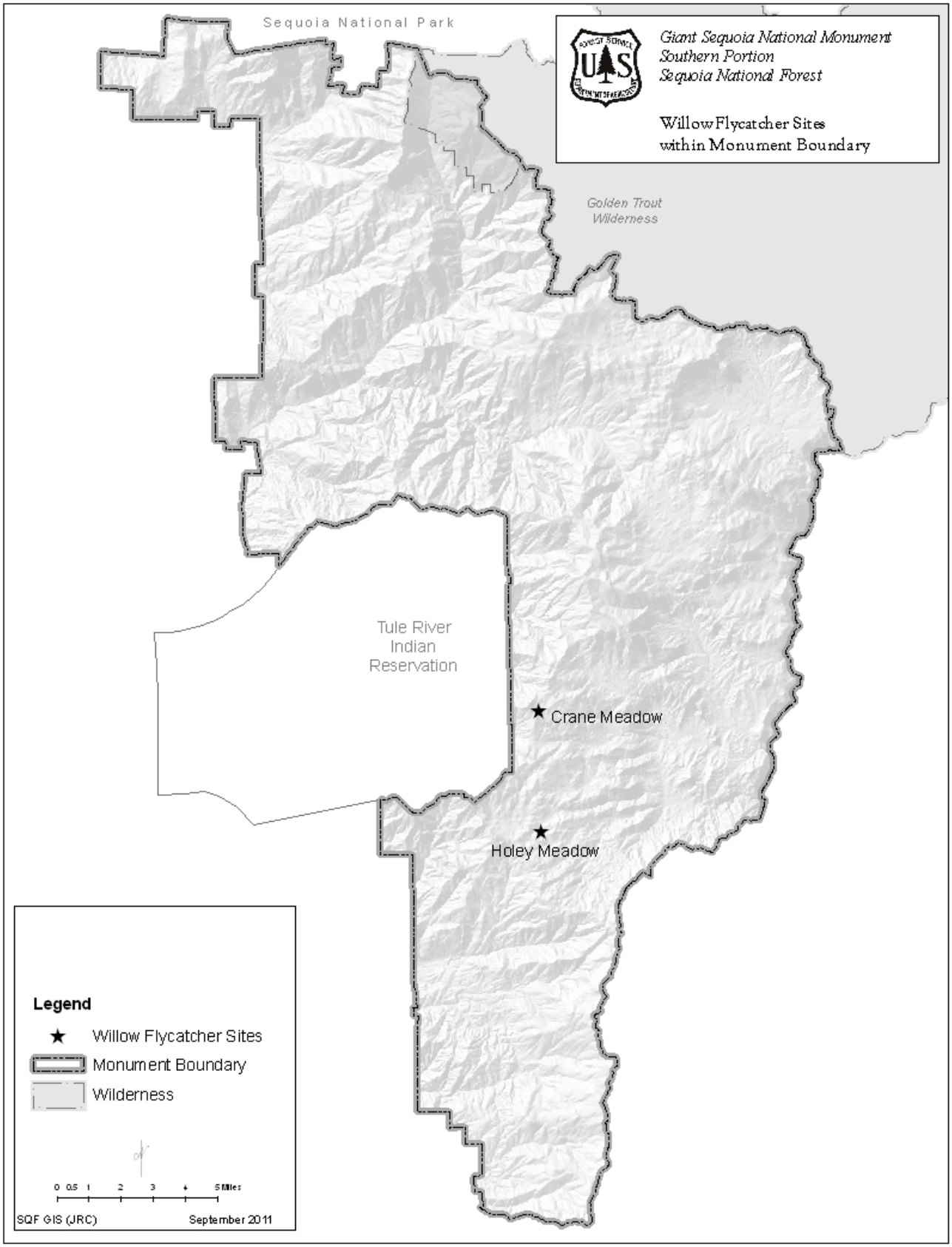
This is a programmatic level FEIS with no proposed ground disturbing activities and therefore, no direct effects.

Indirect Effects

1. Vegetation Management: Potential effects to habitat would be limited to prescribed fire in meadows or willow thickets and meadow restoration activities.

All Alternatives—There are no differences in the management of meadows or riparian areas identified in the alternatives. Restoration of degraded meadows is a desired condition for all alternatives. Vegetation management projects for fuels reduction and ecological restoration are unlikely to affect little willow flycatcher habitat.

Map 8


Sequoia National Park
Giant Sequoia National Monument
Southern Portion
Sequoia National Forest
Willow Flycatcher Sites
within Monument Boundary
Golden Trout
Wilderness
Tule River
Indian
Reservation
Crane Meadow
Holey Meadow
Legend
Willow Flycatcher Sites
Monument Boundary
Wilderness
0 0.5 1 2 3 4 5 Miles
SQF GIS (JRC)
September 2011

2. Recreation Impacts: Developed recreation sites, dispersed camping, and roads potentially cause disturbance and habitat fragmentation in little willow flycatcher habitat.

Alternatives A, B, D, E, and F—The acres of potential little willow flycatcher habitat subject to disturbance and habitat fragmentation would be the same for Alternatives A, B, D, E, and F.

Alternative C—Alternative C would focus recreation at developed sites and eliminate dispersed camping. The elimination of dispersed camping may reduce disturbance near meadow and willow thickets that are potential nesting sites for little willow flycatchers. However, increased use of the developed recreation areas near Crane Meadow, Holey Meadow and Millwood may lead to an increase in disturbance at these historically occupied sites. The expected overall risk of disturbance to little willow flycatchers is slightly less than in the other alternatives.

3. Special Management Areas: The SNFPA FEIS identified five areas as "occupied" little willow flycatcher sites within the Monument. The 2001 SNFPA ROD required regular monitoring of these sites and measures to maintain habitat quality.

Alternative A—Alternative A would continue to follow the 2001 SNFPA guidelines for monitoring and habitat protection of the five little willow flycatcher sites within the Monument. Restoration of meadows near known little willow flycatcher sites would be a priority.

Alternatives B, C, D, and F—Alternatives B, C, D, and F would adopt the 2004 SNFPA guidelines for monitoring and habitat protection of the five little willow flycatcher sites within the Monument. None of these sites are currently occupied. Should they be used by nesting birds in the future, shifting to the 2004 SNFPA guidelines and allowing late season grazing to begin August 15 could increase the potential for disturbance of nesting little willow flycatchers over current management (2001 SNFPA guidelines do not allow grazing until September 1). The requirement for monitoring these sites on a four year cycle would continue in Alternatives B, C, D, and F.

Alternative E—The 1990 MSA did not address little willow flycatcher habitat protection. Alternative E would not require monitoring or provide protection of known or potential little willow flycatcher nesting sites from grazing or other impacts. Therefore, Alternative E would allow the greatest amount of potential little willow flycatcher habitat loss and disturbance due to the lack of monitoring and protected areas.

Cumulative Effects

The cumulative effects analysis area for the little willow flycatcher includes the southern Sierra Nevada from the Kings River to the Breckenridge Mountains at the southern edge of Sequoia National Forest and east to the Kern Plateau. This includes the Tule River Indian Reservation and portions of Sequoia and Kings Canyon National Parks. This is an appropriate scale for determining cumulative effects to little willow flycatchers since it includes all suitable habitat potentially affected by implementation of an alternative in this FEIS. The cumulative effects time frame is the same as the other species analyzed in this document—20 years into the future. The cumulative effects of all past actions are incorporated into the existing condition.

Vegetation Management—Fuels reduction treatments would be unlikely to impact little willow flycatcher habitat.

Grazing—Grazing allotments in the southern portion of Sequoia National Forest include some meadows that contain potential little willow flycatcher habitat. Management direction for Troy Meadow (on the Kern Plateau), an historically occupied site, follows the 2004 SNFPA guidelines for maintaining habitat. Other meadows are managed following Forest Service utilization standards. Grazing on meadows in Sequoia and Kings Canyon National Parks is limited to pack animals and is regulated to minimize adverse impacts.

Recreation Impacts—The Greenhorn Mountain and Breckenridge areas of Sequoia National Forest completed motorized travel route designation. As a result of this process, motorized cross-country travel will be prohibited. No routes in suitable little willow flycatcher habitat are being added to the National Forest Transportation System. Adverse impacts of motorized vehicles on little willow flycatchers in this area will be reduced due to the elimination of cross-country travel in this portion of the Forest (USDA 2009).

Overall recreation visits within the analysis area are expected to increase. More recreational use may increase the probability of disturbance to little willow flycatchers.

Wildfires—Large stand-replacing fires have the potential to make habitat unsuitable for little willow flycatchers if meadows are affected.

Brown-headed cowbirds—Any development or human activity near meadows in the analysis area may increase the population of brown-headed cowbirds and increase the likelihood of brood parasitism on little willow flycatchers.

Determination

Alternative A—It is my determination that Alternative A would have ***no effect*** on little willow flycatchers. Known sites would continue to be protected following the 2001 SNFPA guidelines. No changes in management of meadows, riparian areas or additional recreational development of potential little willow flycatcher habitat are proposed, so there would be no direct, indirect or cumulative effects to this species.

Alternatives B, C, D, and F—It is my determination that Alternatives B, C, D, and F ***may affect individuals***, but are not likely to result in a trend toward Federal listing or loss of viability of little willow flycatchers. Known sites would be protected following the 2004 SNFPA guidelines. Shifting to the 2004 SNFPA guidelines and allowing late season grazing to begin August 15 increases the potential for disturbance of nesting little willow flycatchers over current management. However, none of these sites are currently occupied. Should they become occupied in the future and given the fact that 90 percent of little willow flycatcher nesting is generally complete by August 15, the risk of disturbance from grazing is probably small. No other changes in management of meadows, riparian areas or additional recreational development of potential little willow flycatcher habitat are proposed.

Alternative E—It is my determination that Alternative E ***may affect individuals***, but is not likely to result in a trend toward Federal listing or loss of viability of little willow flycatchers. This alternative would not provide specific protection for little willow flycatchers or their habitat at the five known sites or other potential areas.

Bald Eagle–Effects

Bald Eagle (*Haliaeetus leucocephalus*)

Habitat Preferences and Biology

Most nests in California are located in ponderosa pine and mixed-conifer stands (Jurek 1988). Other site characteristics, such as relative tree height, tree diameter, species, position on the surrounding topography, distance from water, and distance from disturbance, also appear to influence nest site selection (Grubb 1976, Lehman et al. 1980, Anthony and Isaacs 1981). Bald eagles often construct up to five nests within a territory and alternate between them from year to year (USFWS 1986). Nests are often reused and eagles will add new material to a nest each year (DeGraaf et al. 1991). Trees selected for nesting are characteristically one of the largest in the stand or at least co-dominant with the over story, and usually have stout upper branches and large openings in the canopy that permit nest access (USFWS 1986). Nest trees usually provide an unobstructed view of the associated water body and are often prominently located on the topography (Ibid).

Historic and Current Distribution

Bald eagles are found throughout most of North America and breed or winter throughout California, except in the desert areas (Zeiner et al. 1990, DeGraaf et al. 1991). In California, most breeding occurs in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity Counties (Zeiner et al. 1990). California's breeding population of bald eagles is resident yearlong in most areas, where the climate is relatively mild (Jurek 1988).

Between mid-October and December, migratory individuals from areas north and northeast of the State arrive in California (Ibid). The wintering populations remain in the State through March or early April (Ibid). Based upon annual wintering and breeding bird survey data, it is estimated that between 100-300 bald eagles winter on Sierran Forests and at least 151-180 pairs remain year-round to breed. Wintering

populations in California have increased (Steenhof et al. 2002).

In the Sequoia National Forest, breeding records are limited to anecdotal reports of a breeding pair in the Golden Trout Wilderness. No breeding sites have been discovered within the Monument. Winter use in the Monument occurs along the White River, California Hot Springs, lower Tule River, Kings River up to Yucca Point, Hume Lake and private small lakes near Pinehurst. Bald eagles also utilize Pine Flat Reservoir, which is adjacent to the Monument. There are no known important roost sites within the Monument, although there are occasional observations as noted above.

Reproductive Biology and Breeding Habitat: Breeding generally occurs February to July (Zeiner et al. 1990), but breeding can be initiated as early as January via courtship, pair bonding, and territory establishment. The breeding season normally ends approximately August 31, as the fledglings are no longer attached to the immediate nest site. This time frame may vary with local conditions. One to three eggs are laid in a stick platform nest 50 to 200 feet above the ground and usually below the tree crown (Zeiner et al.1990). Incubation may begin in late February to mid-March, with the nestling period extending to as late as the end of June. From June through August, the fledglings remain restricted to the nest until they are able to move around within their environment. Nesting territories are normally associated with lakes, reservoirs, rivers, or large streams and are usually within two miles from water bodies that support an adequate food supply (Lehman 1979, USFWS 1986). Some of the State's breeding birds winter near their nesting territories. Most nesting territories in California occur from 1000 to 6000 feet elevation, but nesting can occur from near sea level to over 7000 feet (Jurek 1988).

Diet and Foraging Habitat: Bald eagles are generalized and opportunistic scavengers-predators (Detrich 1981, Jurek 1988). The most common prey items for bald eagles on the West Coast are fish, waterfowl, jackrabbits, and various types of carrion, such as fish, mammals, and water birds (USFWS 1986, Zeiner et al. 1990). Bald eagles either feed gregariously on abundant prey, such as spawning fish, or individually (Zeiner et al. 1990). Diurnal perches are used during foraging; these usually have a good view of the surrounding area and are often the highest perch sites available (Stalmaster 1976, USFWS 1986). In general, foraging habitat consists of large bodies of water or free-flowing rivers with abundant fish and adjacent snags and other perches (Zeiner et al. 1990).

Winter Habitat: Wintering habitat is associated with open bodies of water, primarily in the Klamath Basin (Detrich 1981, 1982). Smaller concentrations of wintering birds are found at most of the larger lakes and man-made reservoirs in the mountainous interior of the north half of the state and at scattered reservoirs in central and southwestern California (Ibid). Wintering habitat within the Monument has remained in stable condition over the past ten years.

Two habitat characteristics appear to play a significant role in habitat selection during the winter: diurnal-feeding perches, as described above and communal night roost areas. Communal roosts are usually near a rich food resource (USFWS 1986), although Keister and Anthony (1983) found that bald eagles used forest stands with older trees as far as 9.6 miles from the food source in the Klamath Basin. The areas used as communal roosts in the Klamath Basin were forest stands with old (mean age of roost trees was 236 years), open-structured trees located close to the feeding areas (Ibid). In stands where ponderosa pine was dominant, the pine was used almost exclusively for roosting (Ibid). In forest stands that are uneven-aged in the Pacific Northwest, communal roosts have at least a remnant of large, old trees (Anthony et al. 1982).

Most communal winter roosts used by bald eagles throughout the recovery areas offer considerably more protection from the weather than diurnal habitat (USFWS 1986). Human activity near wintering bald eagles can adversely affect eagle distribution and behavior (Stalmaster and Newman 1978).

Risk Factors

Bald eagles are susceptible to disturbance by human activity during the breeding season, especially during egg laying and incubation, and such disturbances can lead to nest desertion or disruption of breeding attempts (USFWS 1986). Other current threats to the species in the Sierra Nevada include disturbance to roost sites by recreation activities, fluctuating fish

populations and number of roosting trees as a result of reservoir level fluctuation, risk of wildfire, and fragmentation of habitat.

Management and Status

The bald eagle was listed as a threatened species by the USFWS in 1978, primarily due to population declines related to habitat loss, combined with environmental contamination of prey species by past use of organochlorine pesticides, such as DDT and dieldrin (USFWS 1986). Bald eagles were de-listed by the USFWS in July 2007. They continue to be protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

The 1990 MSA required the protection of important roost trees and feeding habitat in the vicinity of Pine Flat Reservoir, which is adjacent to the Monument. Currently, management follows the National Bald Eagle Management Guidelines. The state of California still lists bald eagles as endangered, but that status is under review.

Effects

Direct Effects

This is a programmatic level FEIS with no proposed ground disturbing activities and therefore, no direct effects.

Indirect Effects

1. Vegetation Management:

Alternatives A, B, C, D, and E—Vegetation management projects for fuels reduction and ecological restoration in Alternatives A, B, C, D, and E are unlikely to affect bald eagle habitat. Trees large enough to provide bald eagles with diurnal perches would only be removed if they were safety hazards. Riparian areas provide the habitat most important to bald eagles and no changes in management of riparian areas are proposed that would reduce habitat quality for eagles.

Alternative F—Alternative F would eliminate the standard and guideline from the 2001 SNFPA requiring retention of all conifer trees with a dbh of 30 inches or greater and hardwoods with a dbh of 12 inches or larger when implementing vegetation treatments. Diameter limits in California spotted owl and northern goshawk PACs (25,851 acres) would also be eliminated, except for the six-inch diameter limit for trees within one to two acres of a nest tree. The potential for short-term loss of habitat features important to bald eagles would likely be higher in Alternative F than in the other alternatives due to the lack of diameter limits on tree felling.

2. Recreation Impacts: Developed recreation sites, dispersed camping, and roads potentially cause disturbance and habitat fragmentation in bald eagle habitat.

Alternatives A, B, D, E, and F—The amount of bald eagle habitat subject to disturbance and habitat fragmentation would be about the same for Alternatives A, B, D, E, and F.

Alternative C—Alternative C would focus recreation at developed sites and eliminate dispersed camping. The elimination of dispersed camping may reduce disturbance near some feeding sites used by bald eagles. However, increased use of the developed recreation areas near the Kings River, White River, California Hot Springs, lower Tule River, and Hume Lake may lead to an increase in disturbance at these sites. Some roads near bald eagle habitat may be eliminated in Alternative C. The overall risk of disturbance to bald eagles is probably slightly less than in the other alternatives.

3. Special Management Areas: There are currently no special management areas for bald eagles in the Monument. Much of the habitat most important to bald eagles falls within RCAs.

Alternative E—Management of riparian areas would follow the 1988 Forest Plan and the 1990 MSA. There would be no RCAs, CARs, or RCOs. Alternative E would have the least protection of riparian habitat.

Cumulative Effects

The cumulative effects analysis area for the bald eagle includes the southern Sierra Nevada from the Kings River to the Breckenridge Mountains at the southern edge of Sequoia National Forest and east to the Kern Plateau. This includes the Tule River Indian Reservation and portions of Sequoia and Kings Canyon National Parks. This is an appropriate scale for determining cumulative effects to bald eagles, since it includes all suitable habitat potentially affected by implementation of an alternative in this FEIS. The cumulative effects time frame is the same

as the other species analyzed in this document—20 years into the future. The cumulative effects of all past actions are incorporated into the existing condition.

Vegetation Management—Fuels treatment activities are unlikely to affect bald eagle habitat in the analysis area. The removal of large snags that are deemed safety hazards is possible in developed areas (Lake Isabella, Pine Flat Lake).

Recreation Impacts—The southern portion of Sequoia National Forest completed motorized travel route designation. As a result of this process, motorized cross-country travel will be prohibited. Sixteen areas open to motorized vehicles will be added to the National Forest Transportation System at Lake Isabella in suitable bald eagle foraging habitat. Adverse impacts of motorized vehicles on bald eagles in the analysis area may be reduced due to the elimination of cross-country travel in this portion of the Forest (USDA 2009).

Overall recreation visits within the analysis area are expected to increase. More recreational use may increase the probability of disturbance to bald eagles.

Wildfires—Large stand-replacing fires will likely change bald eagle use in an area. Bald eagle populations can be reduced by fires that destroy old-growth forests. However, snags that provide perching sites may also be created by fire (Snyder 1993).

Determination

Alternatives A, B, C, D, and E—It is my determination that Alternatives A, B, C, D, and E would have ***no effect*** on bald eagles. Habitat important to bald eagles would continue to be protected following RCA guidelines. Trees large enough to provide bald eagles with diurnal perches would only be removed if they were safety hazards. Therefore, there would be no direct, indirect or cumulative effects to this species.

Alternative F—It is my determination that Alternative F ***may affect individuals***, but is not likely to result in a trend toward Federal listing or loss of viability of bald eagles. Alternative F has the potential to remove large trees that could serve as diurnal perches for bald eagles due to the lack of diameter limits on tree felling. However, modeling showed an increasing trend in the number of large and very large trees in the Monument in Alternative F (SPECTRUM model).

Great Gray Owl–Effects

Great Gray Owl (*Strix nebulosa*)

Habitat Preferences and Biology

In the Sierra Nevada, great gray owls are found in mixed conifer forest from 2,400 to 9,000 feet elevation where such forests occur in combination with meadows or other vegetated openings. Nesting usually occurs within 600 feet of the forest edge and adjacent open foraging habitat. Most nests are made in broken top snags (generally firs), but platforms such as old hawk nests, mistletoe infected limbs, etc. are also used. Nest trees or snags are generally greater than 21 inches dbh and 20 feet tall. Great gray owls have nested on artificial platforms. The breeding density of this bird seems limited by both prey and nest site availability.

Timing of breeding activities varies along both a north-south gradient and an elevation gradient in California. Egg laying in California begins in late March or early April at low elevation sites, and can be as much as a month later at high elevation sites. Courtship activities occur a month prior to egg laying. Snow conditions on the breeding grounds appear to control the onset of nesting, and it is possible that late spring rains cause nest abandonment.

The diet of the great gray owl may vary locally but consists primarily of small mammals, predominantly rodents. All available literature indicates that great gray owls in the western United States overwhelmingly select only two prey taxa: voles (*Microtus spp.*) and pocket gophers (*Thomomys spp.*). Voles prefer meadows with dense herbaceous vegetative cover (Zeiner et al 1990). A four-inch stubble height at the end of the growing season is thought to provide suitable cover for voles (Beck 1985) although other studies suggest herbaceous heights of 12 inches are preferred (Greene 1995). Gophers are predominantly subterranean but they also appear to have herbaceous cover preferences (Greene 1995). Compaction of meadow soils may reduce the suitability of areas for gophers. Great gray owls catch these mammals by breaking through their tunnels. During the winter, great gray owls have been observed plunging through the snow to capture prey.

Foraging habitat in the Sierra Nevada is generally open meadows and grasslands in forested areas, and trees along the forest edge are used for hunting perches. Openings caused by fires or timber harvest serve as foraging habitat when the vegetation is in early successional stages (Hayward 1994, Greene 1995). Greene (1995) found that sites occupied by great gray owls had greater plant cover, vegetation height, and soil moisture than sites not occupied by owls. Canopy closure was the only variable of three variables measured (canopy closure, number of snags greater than 24 inches dbh, and number of snags less than 24 inches dbh) that was significantly larger in occupied sites than in unoccupied sites.

Historic and Current Distribution

The great gray owl is a holarctic species. It remains evenly distributed across its range but has variability in local distribution. Godfrey (1986) gives its range as south of the tree line in northern Yukon, northwest and central Mackenzie River basin (Lockhart River and Great Slave Lake), north Saskatchewan, Manitoba, north Ontario south through southern Yukon and interior British Columbia, north and central Alberta, Manitoba, and central Ontario. In the U.S. its range includes Alaska, Washington, northern Idaho, western Montana south through the Cascade and Sierra Nevada ranges to east-central California, west-central Nevada, and northwest Wyoming. The southern populations in the western U.S. are considered relatively stable, breeding every year and remaining in the same general area throughout the year, although, as previously stated, breeding in Yosemite National Park is somewhat sporadic (Winter 1999). The northern populations and those at the southern edge of the range in eastern Canada are considered less stable. The Sierra Nevada populations are the most southerly populations of this species in the world.

There have been several historic detections of great gray owls in the Monument, mostly in the northern section but also near Camp Nelson. A nest site was located on the Hume Lake District in 2009, and at least two chicks successfully fledged (CDFG, pers. comm.). The site was again occupied by a pair of great gray owls in 2011.

Risk factors

Collision with motor vehicles is a major source of mortality in some areas, including one case in the Monument near Stony Creek. Shooting still occurs in many areas (Nero and Copeland 1981). However, these types of mortality have not been identified as significantly threatening the species in the Sierra Nevada (Beck and Winter 2000). Predation of eggs and young by other raptor species, especially great horned owls, may be common. Impalement on barbed wire and electrocution on transmission lines have also been reported.

Management and Status

The great gray owl is a Forest Service sensitive species in both Region 4 and Region 5. It was classified as an endangered species by the State of California in October 1980. The 2001 SNFPA stipulates that PACs of at least 50 acres of the highest quality nesting habitat be established around all known great gray owl nest stands. One great gray owl PAC has been designated in the Monument (Map 9).

Effects

Direct Effects

This is a programmatic level FEIS with no proposed ground disturbing activities and therefore, no direct effects.

Indirect Effects

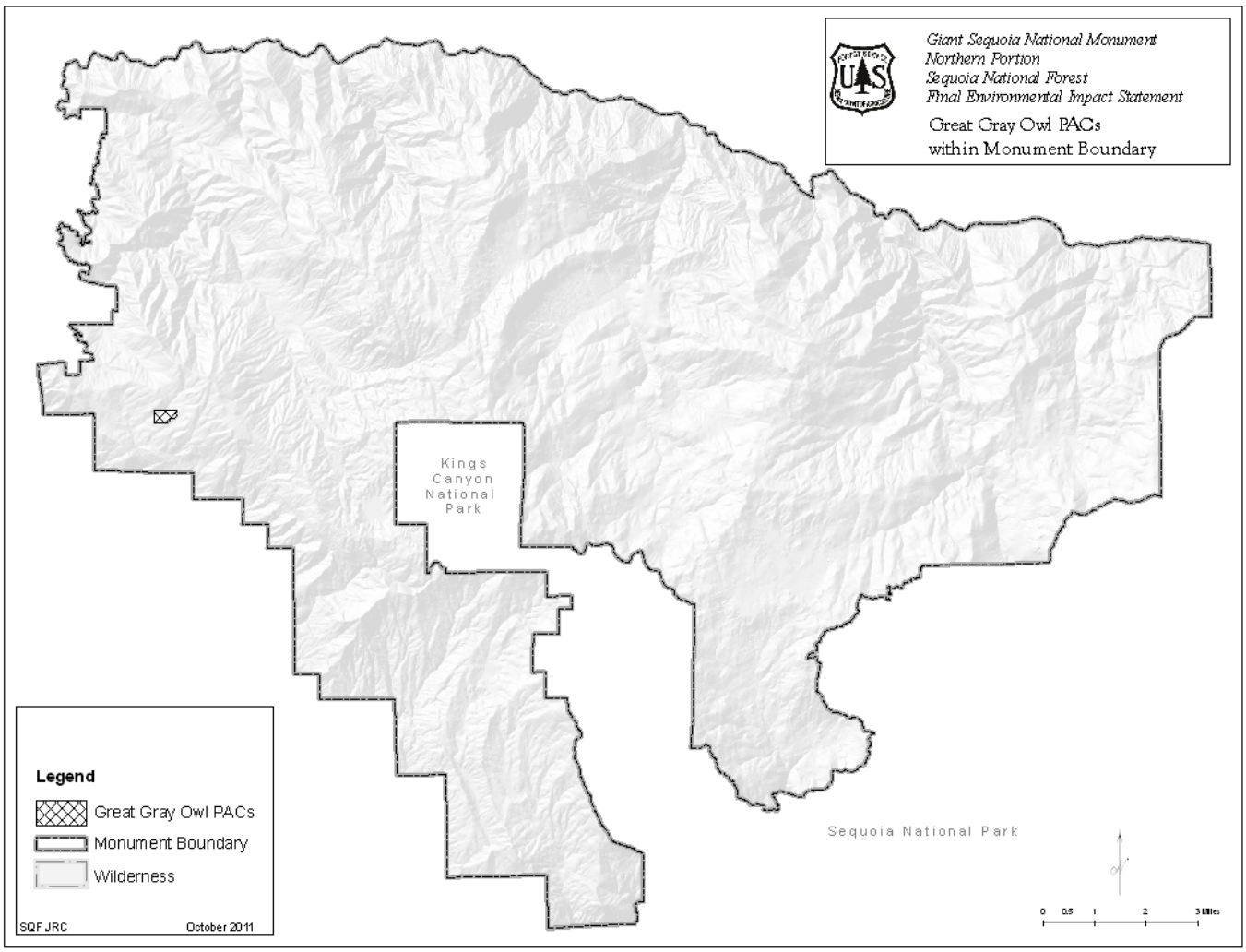
1. Vegetation Management: Vegetation management projects for fuels reduction and ecological restoration may affect great gray owl habitat by affecting prey abundance and nest site availability.

Alternatives A, B, C, and D—In Alternatives A, B, C, and D, trees large enough to be potential nest trees (greater than 30 inches dbh) would not be removed for fuels reduction or ecological restoration. Trees this size would only be removed if they posed a safety hazard.

Alternative E—In Alternative E, there would be no diameter limits on trees removed for fuels reduction or ecological restoration except inside WUI defense zones. Although unlikely, potential nest trees could be removed. Inside the defense zones, the diameter limit for tree felling would be 30 inches dbh, except for safety hazards.

Alternative F—In Alternative F, there would be no diameter limits on trees removed for fuels reduction,

Map 9



ecological restoration, or safety hazards. Although unlikely, potential nest trees could be removed.

2. Recreation Impacts: Recreation has the potential to affect great gray owls through vehicle collisions, disturbance at nest sites, and snag reduction.

Alternatives A, B, D, E, and F—Great gray owl habitat subject to vehicle use, disturbance, and habitat fragmentation would be the same for Alternatives A, B, D, E, and F.

Alternative C—Alternative C would focus recreation at developed sites and eliminate dispersed camping. The elimination of dispersed camping may reduce disturbance near nesting sites used by great gray owls. However, increased use of the developed recreation areas near meadows may lead to an increase in disturbance at these sites. Some roads near great gray owl habitat may be eliminated in Alternative C. The overall risk of disturbance to great gray owls is probably slightly less than in the other alternatives.

3. Special Management Areas: Great gray owl PACs are specific land allocations established to preserve key habitat characteristics and restrict project-related disturbance with LOPs (details are in the wildlife standards and guidelines, FEIS, Volume 2, Appendix A). The first confirmed great gray owl nest in the Monument was discovered by a CDFG Biologist in 2009 (Tim Kroeker, pers. comm.). A 63-acre PAC was established to protect this nesting area. Other land allocations, although not specifically aimed at protecting great gray owls, also protect owl habitat by maintaining large trees and restricting management

activities in meadows. These areas include: RCAs, CARs, and old forest emphasis areas.

Alternatives A, B, and F—Alternatives A, B, and F would maintain habitat and restrict management activities on approximately 63 acres in the current PAC. An LOP of approximately March 1 to August 15 for activities within one-quarter mile of the nest site would be required for vegetation management activities. Habitat characteristics important to great gray owls would also be protected in RCAs (meadows), CARs (27,147 acres), and old forest emphasis areas (160,607 acres). Each of these land allocations has unique standards and guidelines which vary in the level of protection they provide for great gray owl habitat (see wildlife standards and guidelines, FEIS, Volume 2, Appendix A).

Alternative C—Alternative C would not include great gray owl PACs or other wildlife protection land allocations. Alternative C would evaluate the impacts of fuels reduction and restoration projects on great gray owls with BEs. LOPs appropriate for great gray owls would be utilized as needed.

Although there is no specific land allocation for the protection of great gray owls in Alternative C, management activities with the potential to negatively affect owls or their habitat are very limited.

Alternative D—Alternative D would maintain the current great gray owl PAC and restrict management activities at the known nesting site. It would also maintain RCAs and CARs. In Alternative D, the land allocation of old forest emphasis areas would be eliminated. Instead the entire Monument would be managed for wildlife, with particular emphasis on old forest dependent species.

Alternative E—There would be no great gray owl PACs in Alternative E. Of the alternatives, Alternative E would allow the greatest amount of great gray owl habitat loss and disturbance due to fewer acres of protected areas and fewer restrictions on activities that degrade habitat quality.

Cumulative Effects

The cumulative effects analysis area for the great gray owl includes the Sierra Nevada from Yosemite National Park to the Breckenridge Mountains at the southern edge of Sequoia National Forest and east to the Kern Plateau. This includes the Tule River Indian Reservation and Sequoia and Kings Canyon National Parks. This is an appropriate scale for determining cumulative effects to great gray owls, since it includes nearly the entire known range of great gray owls within California. The cumulative effects time frame is the same as other species—20 years out into the future. In addition, cumulative effects of all past actions are incorporated into the existing condition.

Vegetation Management—Fuels reduction treatments that may impact great gray owl habitat are currently occurring and would continue to occur throughout the analysis area. These treatments are generally focused near communities and other developed areas. Prescribed fire is a tool expected to be used throughout the area, with mechanical and hand thinning also occurring. The number of acres of great gray owl habitat likely to be impacted in the analysis area is small, given the constraints on treatments (funding, air quality, etc.).

Grazing—Grazing allotments in the southern portion of Sequoia National Forest include some meadows with historic great gray owl detections. These include Dry Meadow, Troy Meadow, and Paloma Meadow. Should nesting be confirmed in any of these areas, management would follow the 2004 SNFPA guidelines for maintaining habitat. Other meadows in the Forest are managed following Forest Service utilization standards. Grazing on meadows in Yosemite, Sequoia and Kings Canyon National Parks is limited to pack animals and is regulated to minimize adverse impacts.

Recreation Impacts—The Greenhorn Mountain and Breckenridge areas of Sequoia National Forest completed motorized travel route designation. In this process, motorized cross-country travel will be prohibited. No user created routes are being added to the National Forest Transportation System within one-quarter mile of meadows. Adverse impacts of motorized vehicles on great gray owls in this area will be reduced due to the elimination of cross-country travel on this portion of the Forest (USDA 2009).

Overall recreation visits within the analysis area are expected to continue to increase. More recreational use may increase the probability of disturbance to great gray owls.

Wildfires—Large stand-replacing fires have the potential to affect habitat suitability for great gray owls by changing prey densities and altering the abundance of snags and down woody debris. Mortality of nestlings or fledglings is possible if fires occur during the breeding season (Ulev 2007).

Determination

Alternatives A, B, C, D, and F—It is my determination that Alternatives A, B, C, D, and F ***may affect individuals***, but are not likely to result in a trend toward Federal listing or loss of viability of great gray owls. Alternatives A, B, C, D, and F would allow short-term reductions in habitat quality by removing trees, snags and down woody material, but the extent of potential vegetation management activities in or around meadows is limited by RCA guidelines. The potential for disturbance during nesting is reduced by utilizing an LOP around known nesting sites. In Alternative F there would be no diameter limits on trees removed for fuels reduction, ecological restoration, or safety hazards. Although unlikely, potential nest trees could be removed.

Alternative E—It is my determination that Alternative E ***may affect individuals***, but is not likely to result in a trend toward Federal listing or loss of viability of great gray owls. Alternative E would allow short-term reductions in habitat quality (by removing trees, snags and down woody material) and the potential for disturbance during nesting is greater than in the other alternatives because of the lack of LOPs.

California Spotted Owl–Effects

California Spotted Owl (*Strix occidentalis occidentalis*)

Habitat Preferences and Biology

The California spotted owl is one of three recognized subspecies of spotted owls, including the northern spotted owl, (*Strix occidentalis caurina*) and the Mexican spotted owl (*Strix occidentalis lucida*) (American Ornithologists' Union 1957). The spotted owl is a brown, medium sized (16-19 inches tall) owl covered with irregular white spots.

Unlike northern spotted owls, some California spotted owls migrate, moving downslope for the winter. California spotted owls migrated a mean straight-line distance of twenty miles in the El Dorado National Forest and a mean of 12.3 miles in the Sierra National Forest (Verner et al. 1992). Three studies (Laymon 1988, Neal et al. 1988, 1989, 1990, Call 1990, Verner et al. 1991) tracked 32 California spotted owls to determine whether they migrated: 44 percent were altitudinal migrants. The reasons why only some individuals migrate are unclear. Migration may expose California spotted owls to greater risk of mortality.

California spotted owls are considered prey specialists (Verner et al. 1992) because they select a few key species (Verner et al. 1992) among the variety of taxa on which they prey, which includes mammals, birds, and insects (Barrows 1980, Hedlund 1996, Marshall 1942, Smith et al. 1999, Thrailkill and Bias 1989). In the upper elevations of the Sierra Nevada, the primary prey is the northern flying squirrel (*Glaucomys sabrinus*) (Verner et al. 1992). In lower elevations of the Sierra Nevada and in Southern California, the primary prey is the dusky-footed woodrat (*Neotoma fuscipes*) (Thrailkill and Bias 1989). Both flying squirrels and woodrats occur in the diets of California spotted owls in the central Sierra Nevada (Verner et al. 1992).

California spotted owls are primarily territorial; however non-territorial spotted owls ("floaters") may also exist in populations and occupy territories after they are vacated (Gutiérrez 1994, LaHaye et al. 1994). Estimates of California spotted owl home range size are extremely variable. Based on an analysis of data from telemetry studies of California spotted owls, mean breeding season, pair home range sizes have been estimated (using 100 percent minimum convex polygon method): 9,000 acres on the Lassen National Forest, true fir type; 4,700 acres on the Tahoe and El Dorado National Forests, mixed conifer type; and 2,500 acres on the Sierra National Forest, mixed conifer type. All available data indicate that home ranges are smallest in habitats at relatively low elevations that are dominated by hardwoods, intermediate in size in conifer forests in the central Sierra Nevada, and largest in the true fir forests in the northern Sierra Nevada (Verner et al. 1992). Home ranges of California spotted owls in areas

where the primary prey is northern flying squirrels are consistently larger than those where the primary prey is dusky-footed woodrats presumably because woodrats occur in greater densities and weigh more than flying squirrels (Zabel et al. 1992). As of 1992, approximately 25 percent of known California spotted owl sites were found where woodrats are the primary prey species and 75 percent of sites were found where flying squirrels are the primary prey species (Verner et al. 1992).

The California spotted owl breeding cycle extends from about mid-February to mid- to late September. Egg laying through incubation, when the female California spotted owl must remain at the nest, extends from early April through mid- to late May. California spotted owls nest in a variety of tree/snag species in pre-existing structures such as cavities, broken top trees, and platforms such as mistletoe brooms, debris platforms and old raptor or squirrel nests (Gutiérrez et al. 1992, 1995). Young owls typically fledge from the nest in mid to late June. In the weeks after fledging, the young are very weak fliers and remain near the nest tree. Adults continue to bring food to the fledglings until mid- to late September when the young disperse. Summarized information on the dispersal abilities of California spotted owls is scant. Information in Verner et al. (1992) indicates that two-thirds of the juveniles would be expected to disperse at least eight miles.

Not all pairs of California spotted owls nest every year. In fact, over the ten years of demographic studies in the Sierra Nevada, 1992 was the only year when nearly all study owls nested. It is not unusual for California spotted owls in an established activity center to skip several years between one nesting and the next. Sites may be vacant for several consecutive years when the population is in decline, but then be reoccupied to support breeding pairs during a population upswing. California spotted owls as a species have apparently evolved high adult survival rates associated with irregular and unpredictable reproduction (Noon and Biles 1990), where a long life span allows eventual recruitment of offspring even if recruitment does not occur each year (Franklin et al. 2000). California spotted owls are long-lived (spotted owls in the wild have been known to be 17 years old) and adult survival rates in the Sierra Nevada are relatively high (greater than 0.80; Noon et al. 1992, Blakesley and Noon 1999, Steger et al. 1999), indicating the species may be able to persist over the short-term even with extensive reduction in the amount of its suitable habitat (Noon et al. 1992). California spotted owl occupancy rates and densities were found to be similar in recently burned forests versus unburned forests in Yosemite National Park (Roberts et al. 2010).

In the Sierra Nevada, 80 percent of California spotted owl sites have been found in mixed conifer forests (sugar and ponderosa pine, white fir, Douglas-fir, giant sequoia, incense-cedar, black oak, and red fir), 10 percent in red fir forests (red and white fir, lodgepole pine, and quaking aspen) seven percent in ponderosa pine/hardwood forests (ponderosa pine, interior and canyon live oak, black oak, incense-cedar, white fir, tanoak, and Pacific madrone), and three percent in other forest types such as east-side pine (ponderosa and Jeffrey pine), and foothill riparian/hardwood (cottonwood, California sycamore, interior live oak, Oregon ash, and California buckeye) (Verner et al. 1992).

Six major studies (Gutiérrez et al. 1992) described habitat relations of the California spotted owl in four general areas spanning the length of the Sierra Nevada. These studies examined California spotted owl habitat use at three scales: landscape; home range; and nest, roost, or foraging stand. By comparing the amount of time California spotted owls spend in various habitat types to amount of habitat available, researchers determined that spotted owls preferentially used areas with at least 70 percent canopy cover, used habitats with 40 to 69 percent canopy cover in proportion to its availability, and spent less time in areas with less than 40 percent canopy cover than might be expected.

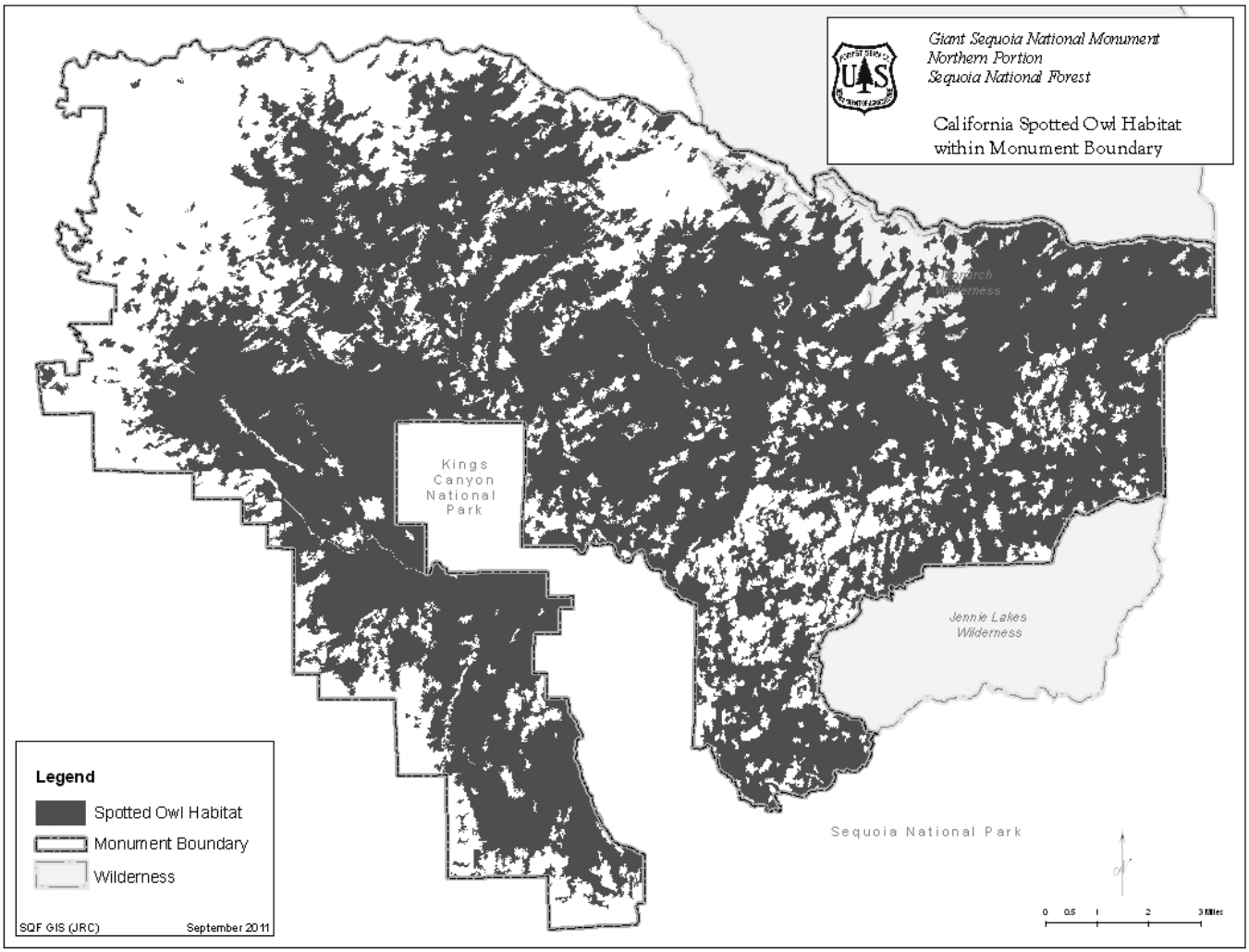
In studies referenced by Gutiérrez et al. (1992), California spotted owls foraged most commonly in intermediate- to late-successional forests with greater than 40 percent canopy cover and a mixture of tree sizes, some larger than 24 inches in dbh. California spotted owls owls consistently used stands with significantly greater canopy cover, total live tree basal area, basal area of hardwoods and conifers, snag basal area, and dead and downed wood, when compared with random locations within the forest. Studies on the Tahoe National Forests found that California spotted owls foraged in stands with large

diameter trees significantly more than expected based on availability. Bond et al. (2009) found that California spotted owls tended to select burned areas, particularly high severity burned areas, for foraging. The study was conducted on Sequoia National Forest in an area affected by the McNally fire. In radio tracking studies, the area including half of the foraging locations of California spotted owls was found to vary from an average of 317 acres on the Sierra National Forest to an average of 788 acres on the Lassen National Forest (Verner et al. 1992).

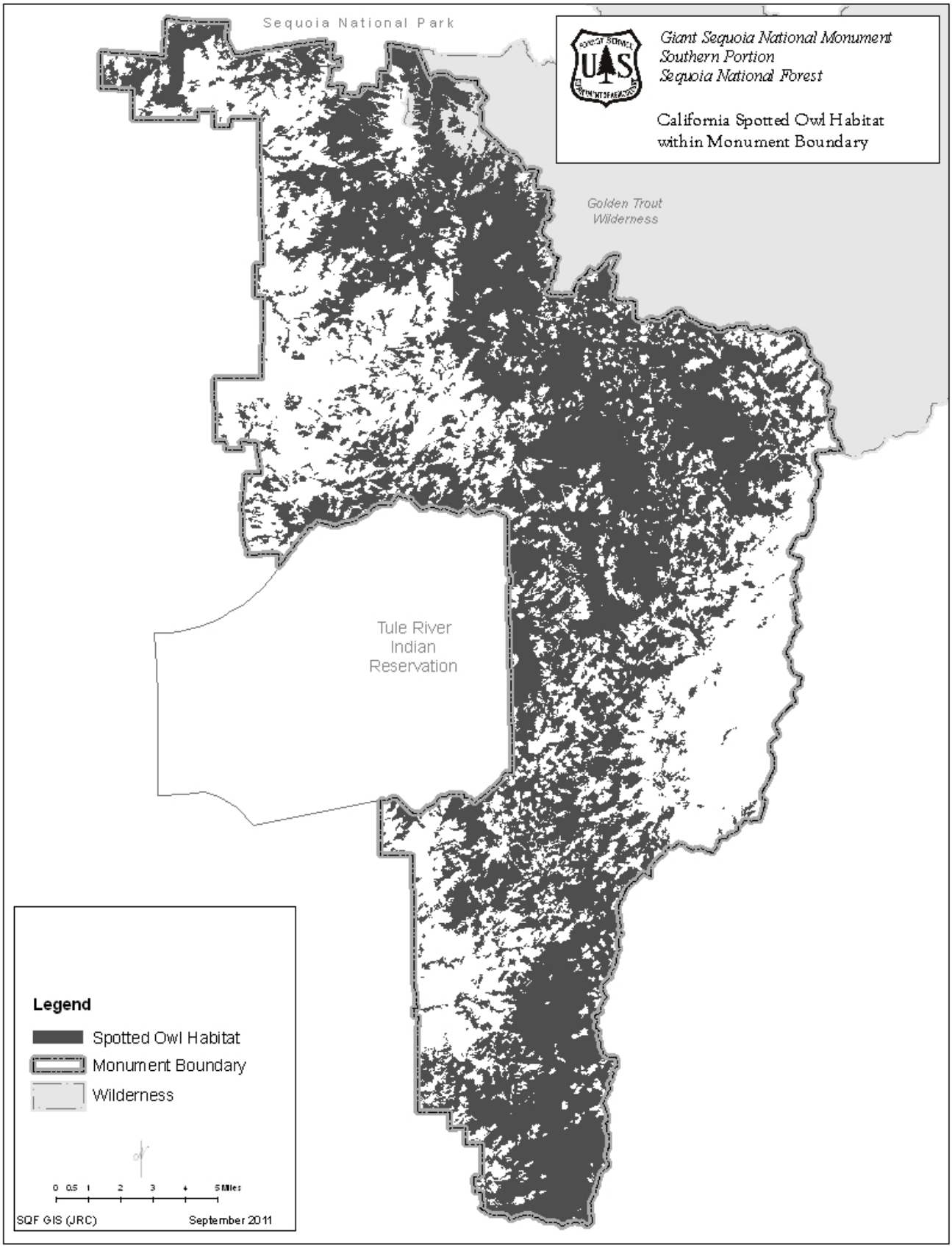
In studies referenced by Gutiérrez et al. (1992), California spotted owls preferred stands with significantly greater canopy cover, total live tree basal area, basal area of hardwoods and conifers, and snag basal area for nesting and roosting. In general, stands suitable for nesting and roosting have (1) two or more canopy layers, (2) dominant and codominant trees in the canopy averaging at least 24 inches in dbh, (3) at least 70 percent total canopy cover (including the hardwood component), (4) higher than average levels of very large, old trees, and (5) higher than average levels of snags and downed woody material. In an area impacted by the McNally fire on Sequoia National Forest, Bond et al. (2009) found that California spotted owls avoided roosting in high severity burned areas, but utilized low severity burned areas.

Habitat models based on best professional opinion contained in the CWHR database rate the following types as providing high nesting and feeding habitat capability for California spotted owls: structure classes 4M, 4D, 5M, 5D and 6. Using the CWHR model, there are 210,328 acres of moderate and high

Map 10



Map 11


Sequoia National Park
Giant Sequoia National Monument
Southern Portion
Sequoia National Forest
California Spotted Owl Habitat
within Monument Boundary
Golden Trout
Wilderness
Tule River
Indian
Reservation
Legend
Spotted Owl Habitat
Monument Boundary
Wilderness
0 0.5 1 2 3 4 5 Miles
SQF GIS (JRC)
September 2011

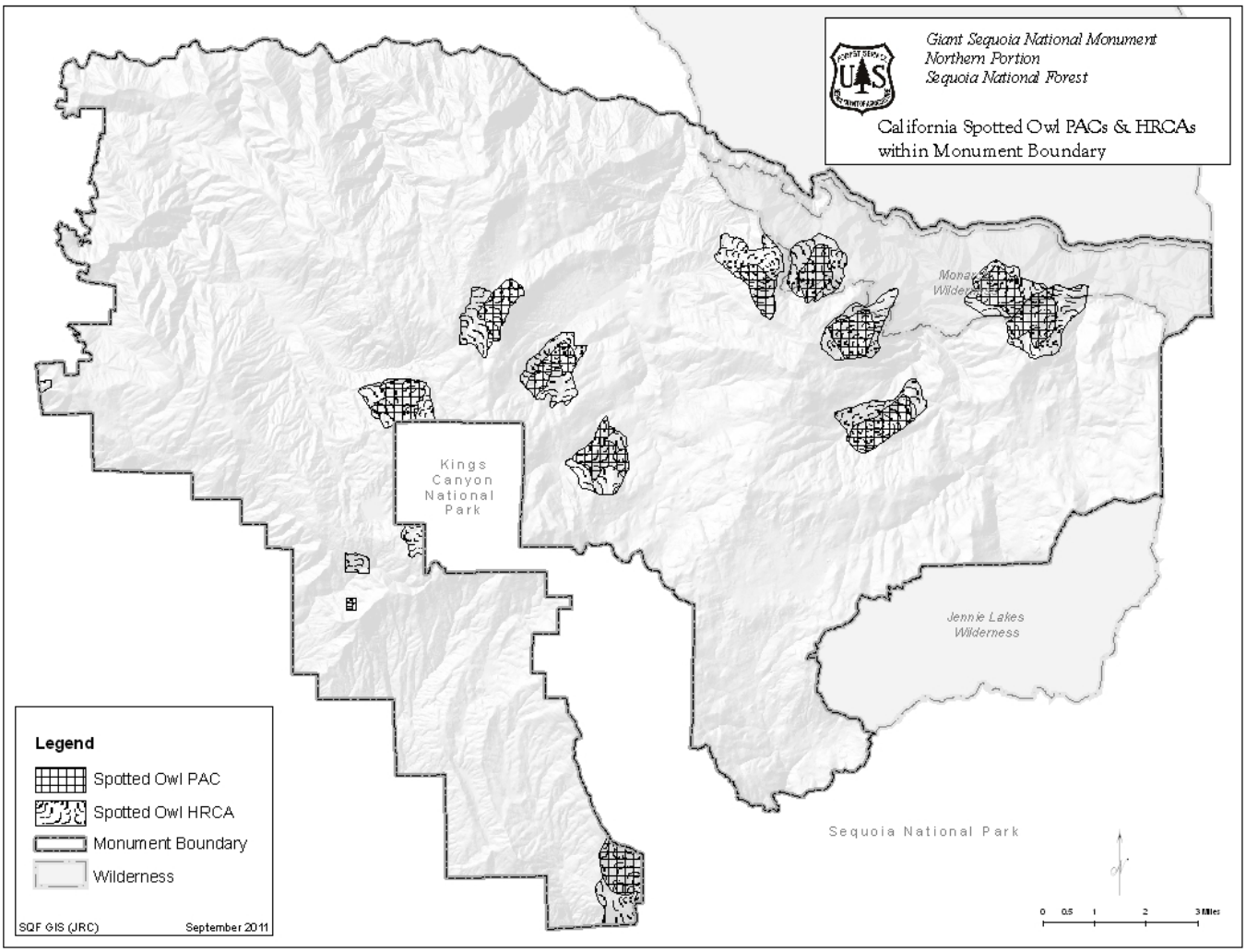
suitability nesting and foraging habitat for California spotted owls in the Monument (Maps 10 and 11).

Historic and Current Distribution

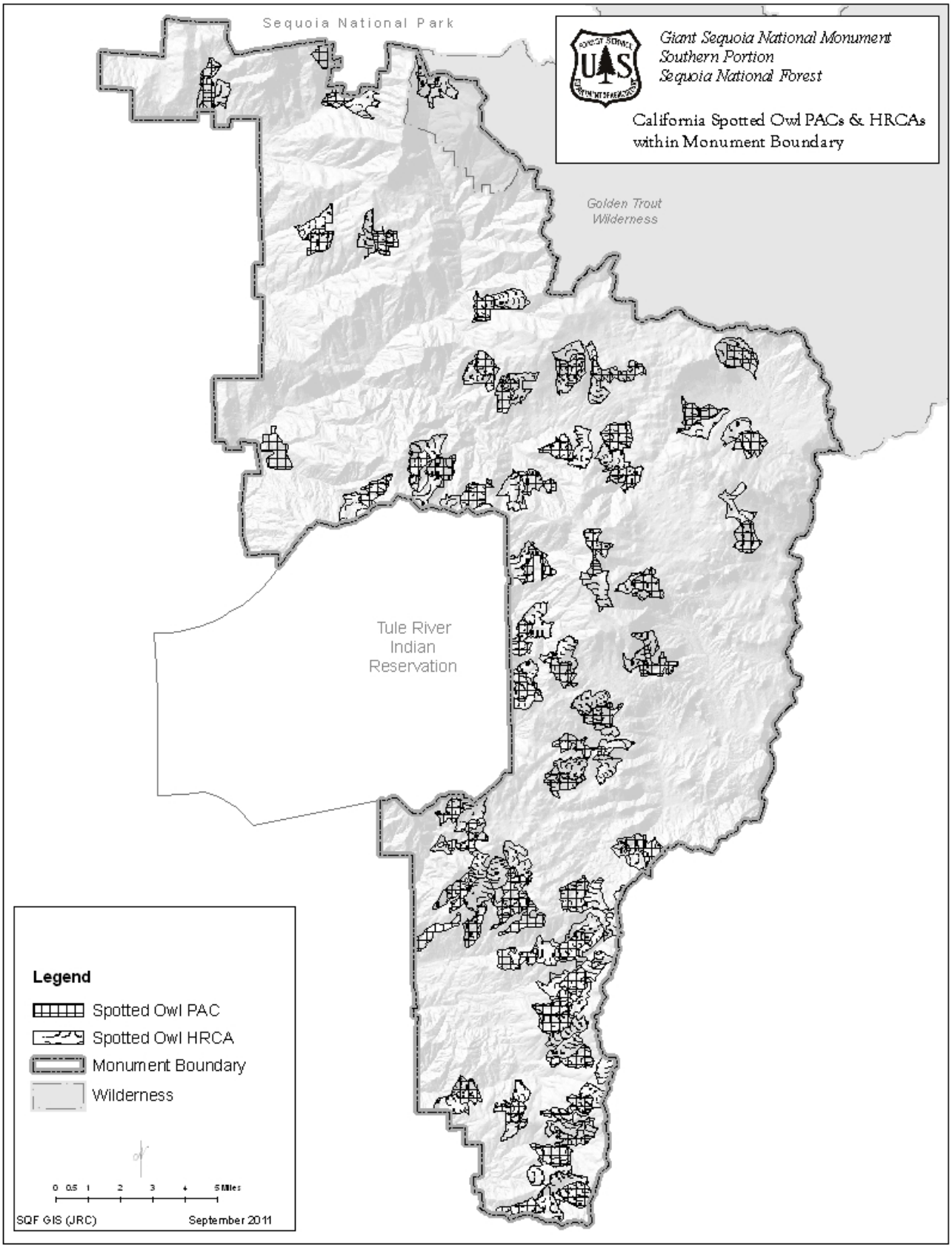
The range of California spotted owls includes the southern Cascades south of the Pit River in Shasta County, the entire Sierra Nevada Province of California (and extending into Nevada), all mountainous regions of the Southern California Province, and the central Coast Ranges at least as far north as Monterey County (Grinnell and Miller 1944, Gould 1977). Within this range, the California spotted owl occurs on 15 National Forests/Management Units administered by the Forest Service, four National Parks, several State Parks and Forests, private timberlands, scattered Bureau of Land Management lands, and tribal lands. The elevation of known nest sites ranges from about 1000 feet to 7700 feet, with about 86 percent occurring between 3000 and 7000 feet.

The California spotted owl population has two major geographic groups, one inhabiting the Sierra Nevada Province and the other in the Southern California Province, with Tehachapi Pass as the dividing line between the two. In conifer forests, mean elevation of nest sites was 5300 feet in the northern Sierra Nevada and 6000 feet in southern California (Gutiérrez et al. 1992). These regions are distinct geographically. In the Sierra Nevada the California spotted owl is mostly continuously and uniformly distributed, with several breaks in distribution where habitat appears limited due to natural or human caused factors (Beck and Gould 1992).In southern California, the California spotted owl occupies “islands” of high elevation forests isolated by lowlands covered by

Map 12



Map 13


Sequoia National Park
Giant Sequoia National Monument
Southern Portion
Sequoia National Forest
California Spotted Owl PACs & HRCAs
within Monument Boundary
Golden Trout
Wilderness
Tule River
Indian
Reservation
Legend
Spotted Owl PAC
Spotted Owl HRCA
Monument Boundary
Wilderness
0 0.5 1 2 3 4 5 Miles
SQF GIS (JRC)
September 2011

chaparral, desert scrub, and increasing (Noon and McKelvey 1992), human development (LaHaye et al. 1994). California spotted owl populations in the two provinces probably seldom exchange individuals, but connectivity may exist through the Tehachapi Mountains and the Liebre/Sawmill area east of Interstate Highway 5.

There are currently 73 California spotted owl PACs located in the Monument (Maps 12 and 13). PACs along with home range core areas (HRCAs) are part of the network of areas managed to provide California spotted owl nesting habitat (USDA 2001). Surveys for California spotted owls have been conducted in accordance with Forest Service Region 5 protocol in various portions of the Monument from since 1986. Reproductive pairs and single birds were recorded during these surveys.

Population Trends

California spotted owl have been monitored in California and throughout the Sierra Nevada through general surveys, monitoring of nests and territorial birds, and demography studies (Verner et al. 1992; USDA Forest Service 2001, 2004, 2006; USFWS 2006; Sierra Nevada Research Center 2007). Current data at the range wide, California, and Sierra Nevada scales indicate that, although there may be localized declines in population trend [e.g., localized decreases in "lambda" (estimated annual rate of population change)], the distribution of California spotted owl populations in the Sierra Nevada is stable.

Management and Status

The USFWS has conducted several significant status reviews of the California spotted owl in response to listing petitions (published 12 month findings: USFWS 2003, USFWS 2006). The latest finding dated May 15, 2006, incorporated the results from the most recent meta-analysis on population dynamics of the California spotted owl, the best-published and unpublished scientific and commercial information, and information submitted to them during the public comment periods. Based on this review, the USFWS found that the listing of the California spotted owl was not warranted. They concluded that "impacts from fires, fuels treatments, timber harvest, and other activities are not at a scale, magnitude, or intensity that warrants listing, and that the overall magnitude of threats to the California spotted owl does not rise to the level that requires the protections of the Act" at this time. The California spotted owl is listed as a California species of special concern by the California Department of Fish and Game.

Management direction in the 2001 SNFPA includes delineation of 300-acre PACs with associated 300-acre HRCAs that have specific restrictions on activity. Standards and guidelines for PACs and HRCAs are intended to limit stand altering activities and disturbance in fuels reduction projects and other management activities (see wildlife standards and guidelines, FEIS, Volume 2, Appendix A).

Effects

Direct Effects

This is a programmatic level FEIS with no proposed ground disturbing activities and therefore, no direct effects.

Indirect Effects

1. Vegetation Management: Vegetation management projects for fuels reduction and ecological restoration may affect California spotted owl habitat by reducing canopy cover and removing key habitat features (large trees, snags, down woody debris). All of the alternatives would follow management direction to set the highest priority for fuels reduction activities in the WUI.

Alternative A (No Action)—Alternative A would continue the existing direction in the 2001 SNFPA to locate fuels treatments across broad landscapes, in order to reduce the spread and intensity of fires. Within California spotted owl habitat (using CWHR model), there are 26,234 acres identified as WUI defense zone (12 percent of spotted owl habitat in the Monument) and 84,560 acres of WUI threat zone (40 percent of spotted owl habitat in the Monument). These areas have the highest priority for fuels treatments and have less stringent requirements for maintaining habitat features important to California spotted owls than areas outside of WUIs.

Alternative B—WUIs would be the same as in Alternative A. In addition, the TFETA, including 33,741 acres of California spotted owl habitat, would be established along the border with the Tule River Reservation. This would place an additional 18,324

acres of spotted owl habitat that is not already in WUI, in a priority area for fuels reduction. The short-term loss of habitat features important to California spotted owls would likely be higher in Alternative B than in Alternatives A, C, D and E. In Alternative B, 61 percent of spotted owl habitat in the Monument would be in one of the priority areas for fuels reduction.

Alternative C—Alternative C would designate a WUI defense zone that extends approximately 300 feet from structures, developed recreation sites, and administrative sites. Approximately 4,990 acres or two percent of the California spotted owl habitat in the Monument would be within WUI defense zones. Assuming that fuels treatments would be concentrated in the WUIs, the short-term loss of habitat features important to California spotted owls would be lower in Alternative C than in Alternatives A, B, E and F.

Alternative D—In Alternative D, approximately 2,685 acres or one percent of the California spotted owl habitat in the Monument would be within the designated WUI defense zone. The number of proposed acres that would be treated in Alternative D is small compared to those that would be treated under the other alternatives. Therefore, the potential for short-term loss of habitat features important to California spotted owls would be the lowest in Alternative D.

Alternative E—The designated WUIs and fuels treatment strategy would be the same as in Alternative A (No Action). Therefore, the effects on California spotted owl habitat are expected to be the same.

Alternative F—Alternative F would continue existing management direction to make fuels reduction activities in the current WUIs the highest priority. The size of the WUI defense and threat zones would be the same as in Alternatives A, B, and E. In addition, the TFETA would be established. Alternative F would eliminate the standard and guideline from the 2001 SNFPA requiring retention of all conifer trees with a dbh of 30 inches or greater and hardwoods with a dbh of 12 inches or larger when implementing vegetation treatments. There would be a six-inch diameter limit within one to two acres of a nest tree for the California spotted owl. There would be no diameter limit for the rest of the acreage in a California spotted owl PAC. The short-term loss of habitat features important to California spotted owls would likely be higher in Alternative F than in the other alternatives due to the lack of diameter limits on tree felling. The long-term resiliency of California spotted owl habitat to stand-replacing events such as fire, insects, and disease may be improved following treatments for ecological restoration.

2. Recreation Impacts: Gaines et al. (2003) reviewed studies of the northern spotted owl and determined that road associated factors that were likely to affect spotted owls were collisions, disturbance at a specific site, physiological response, edge effects, and snag reduction. These same factors are expected to affect the California spotted owl in a similar way based upon available literature (Verner et al. 1992, Seamans 2005, Blakesley 2003).

Alternatives A, B, E, and F—Approximately 1,095 miles of roads and 202 miles of trails would continue to be utilized for recreation in Alternatives A, B, E, and F. Developed recreation sites would cover about 660 acres and dispersed camping would be permitted. OHV use is allowed on designated roads.

Alternative C—Recreation opportunities in developed sites would be emphasized and increased. Dispersed camping outside of developed sites would be eliminated. Camping in more remote locations, in designated roadless areas, or in the Wildlands recreation niche setting would be allowed by permit. Motorized vehicle traffic would be limited to street licensed vehicles only. Snowmobile use would be eliminated for the public, except to access private property, and otherwise only allowed for administrative reasons or emergency situations. Under Alternative C, the road and trail system providing recreation access would likely be reduced from the current transportation system.

The risk of disturbance to California spotted owls and habitat fragmentation would be concentrated at the developed recreation sites. Overall effects to California spotted owls would be lower than in the other alternatives because of the elimination of dispersed camping, the restriction on type of motorized vehicle use and the reduction of the road system. Fewer acres of potential California spotted owl habitat would be subjected to disturbance, habitat fragmentation, and hazard tree/snag removal.

Alternative D—Recreation would be managed similarly to Alternatives A, B, E, and F except new recreation development would be limited, motorized use would be restricted to street-legal vehicles only, and OSVs would be limited to paved roads. The risk of disturbance to California spotted owls and habitat fragmentation would be less than Alternatives A, B, E, and F because of the restrictions on vehicle types. The overall acres of California spotted owl habitat subject to disturbance would be more than Alternative C but disturbance at specific developed recreation sites would likely be lower.

3. Special Management Areas: California spotted owl PACs are specific land allocations established to preserve key habitat characteristics and restrict project-related disturbance with LOPs. Several other land allocations, although not specifically aimed at protecting California spotted owls, also protect spotted owl habitat by maintaining canopy cover, large trees and down woody debris. These areas include: northern goshawk PACs, fisher and American marten den site buffers, RCAs, CARs, old forest emphasis areas, and the SSFCA.

Alternatives A and B—Alternatives A and B would maintain the 73 current California spotted owl PACs and restrict management activities on 22,651 acres of high quality habitat. An LOP of March 1 to August 15 for activities within one-quarter mile of the nest site would be required for most management activities.

In California spotted owl PACs outside of WUI defense zones (19,181 acres or 85 percent of PAC acres), fuels treatment would be limited to prescribed fire. Prior to burning, hand thinning of trees, less than six inches within a one to two acre area around the nest tree, would be permitted. These restrictions would also apply to areas where a California spotted owl PAC overlaps with a WUI threat zone or the TFETA (in Alternative B).

For California spotted owl PACs within the WUI defense zones (3,470 acres or 15 percent of PAC acres), mechanical treatments would be prohibited within a 500-foot radius buffer around each spotted owl activity center. Prescribed burning would be allowed within the 500-foot buffer. Prior to burning, managers could conduct hand treatments, including the felling of small trees, within the one to two-acre area surrounding nest trees. The remaining area of the PAC could be mechanically treated to meet desired fuels reduction goals.

In California spotted owl HRCAs outside of WUIs (9,368 acres or 40 percent of HRCA acres), design treatments to achieve or approach the fuels goals by reducing surface and ladder fuels less than 12 inches dbh. Do not reduce canopy cover in dominant and co-dominant trees by more than 10 percent across a stand following mechanical treatments. Where pre-treatment canopy cover in dominant and co-dominant trees is between 50 and 59 percent, design mechanical treatments to retain a minimum of 50 percent canopy cover. Do not reduce canopy cover in stands that currently have between 40 and 50 percent canopy cover in dominant and co-dominant trees, except where canopy cover reductions result from removing primarily shade tolerant trees less than six inches dbh. These restrictions would also apply to areas where a California spotted owl HRCA overlaps with the TFETA (in Alternative B) but is not within WUI defense or threat zones.

For California spotted owl HRCAs within the WUI threat zones (10,873 acres or 47 percent of HRCA acres), design mechanical treatments to achieve fuels goals through understory thinning to remove surface and ladder fuels up to 20 inches dbh. Do not exceed a 20 percent reduction in canopy cover in the dominant and co-dominate trees. Where pre-treatment canopy cover is between 50 and 59 percent, design mechanical treatments to retain a minimum of 50 percent canopy cover in dominant and co-dominant trees. In stands that currently have between 40 and 50 percent canopy cover, do not reduce canopy cover except where canopy cover reductions result from removing primarily shade-tolerant trees less than six inches dbh.

For California spotted owl HRCAs within the WUI defense zones (2,931 acres or 13 percent of HRCA acres), standards and guidelines for the defense zone supersede standards and guidelines for HCRAs. There are no restrictions on sizes of trees removed (other than the 20 inch limit in Alternative B) or reduction in canopy cover.

Within the limits imposed by the standards and guidelines, it is not known how many PACs or PAC

acres will actually be treated in a given year. That would be based on project level decisions.

Habitat characteristics important to California spotted owls would also be protected in northern goshawk PACs (3,200 acres), fisher den site buffers (2,965 acres), American marten den site buffers (109 acres), RCAs, CARs (27,147 acres), old forest emphasis areas (160,607 acres), and the SSFCA (333,542 acres). Each of these land allocations has unique standards and guidelines which vary in the level of protection they provide for California spotted owl habitat (see wildlife standards and guidelines, FEIS, Volume 2, Appendix A).

Alternative C—Alternative C would not include California spotted owl PACs or other wildlife protection land allocations. Alternative C would evaluate the impacts of fuels reduction and restoration projects on California spotted owls with BEs. LOPs appropriate for California spotted owls would be utilized as needed.

Although there is no specific land allocation for the protection of California spotted owls in Alternative C, management activities with the potential to negatively affect spotted owls or their habitat are limited. WUI areas, where fuels reduction treatments will be focused, are smaller than in Alternatives A, B, E, and F, and the number of acres expected to be treated is small, compared to Alternatives A, B, E, and F.

Alternative D—Alternative D would maintain the 73 current California spotted owl PACs (22,651 acres) and HRCAs (21,812 acres) and restrict management activities in high quality habitat. It would also maintain northern goshawk PACs, fisher and American marten den site buffers, RCAs, and CARs. In Alternative D, the land allocations of SSFCA and old forest emphasis areas would be eliminated. Instead the entire Monument would be managed for wildlife, with particular emphasis on old forest dependent species.

Alternative D does not allow tree felling for fuels management or ecological restoration, only for safety concerns. The WUI area is less than the other alternatives and the number of acres expected for fuels treatment is smaller than the other alternatives. Therefore the short-term effects on California spotted owls and their habitat are smaller in Alternative D than the other alternatives.

Alternative E—There would be no California spotted owl PACs or HRCAs in Alternative E. Instead, SOHAs on 24,707 acres would be maintained. However, SOHAs only restrict timber harvest, which is not a management option because of the Clinton proclamation (2000). Alternative E requires surveys and evaluation of impacts in a BE for projects within 1.5 miles of the center of a SOHA.

Of the alternatives, Alternative E would allow the greatest amount of short-term California spotted owl habitat loss and disturbance due to fewer acres of protected areas and fewer restrictions on activities that degrade habitat quality.

Alternative F—Alternative F would maintain the 73 current California spotted owl PACs (22,651 acres) and HRCAs (21,812 acres) but diameter limits for tree felling would be eliminated, except for the one to two acre area around the nest stand. An LOP of March 1 to August 15 for activities within one-quarter mile of the nest site would be required for most management activities. Other than Alternative E, Alternative F would allow the greatest amount of short-term California spotted owl habitat loss due to the potential for large tree removal in ecological restoration projects.

Cumulative Effects

The cumulative effects analysis area for California spotted owls includes the southern Sierra Nevada from the Kings River to the Breckenridge Mountains at the southern edge of Sequoia National Forest and east to the Kern Plateau. This includes the Tule River Indian Reservation and portions of Sequoia and Kings Canyon National Parks. This is an appropriate scale for determining cumulative effects to California spotted owls, since it includes all suitable habitat potentially affected by implementation of an alternative in this FEIS. The cumulative effects time frame is the same as the other species analyzed in this document—20 years into the future. In addition, cumulative effects of all past actions are incorporated into the existing condition.

Vegetation Management—Fuels reduction treatments that may impact California spotted owl

habitat are currently occurring and will continue to occur throughout the analysis area. These treatments are generally focused near communities and other developed areas. Prescribed fire is a tool expected to be used throughout the area, with mechanical and hand thinning also occurring. The number of acres of California spotted owl habitat likely to be impacted in the analysis area is small, given the constraints on treatments (funding, air quality, etc.).

Recreation Impacts—The Greenhorn Mountain and Breckenridge areas of Sequoia National Forest completed motorized travel route designation. In this process, motorized cross-country travel will be prohibited and some user created routes in suitable California spotted owl habitat are being added to the National Forest Transportation System. Adverse impacts of motorized vehicles on California spotted owls in this area will be reduced due to the elimination of cross-country travel on this portion of the Forest (USDA 2009).

Overall recreation visits within the analysis area are expected to continue to increase. More recreational use may increase the probability of disturbance to California spotted owls.

Wildfires—Large stand-replacing fires have the potential to make large areas of habitat unsuitable for roosting and nesting California spotted owls by reducing canopy cover and killing large trees. However, stand-replacing fires may improve the quality of foraging habitat, at least in the short-term.

Determination

All Alternatives—It is my determination that all of the alternatives ***may affect individuals***, but are not likely to result in a trend toward Federal listing or loss of viability of California spotted owls. All of the alternatives would allow short-term reductions in habitat quality by removing trees, snags and down woody material; and there is a potential for disturbance to individuals, but only a small portion of the available habitat would be impacted. Modeling of suitable California spotted owl habitat showed increasing trends in acres across all of the alternatives (SPECTRUM model).

Pallid Bat–Effects

Pallid bat (*Antrozous pallidus*)

Habitat Preferences and Biology

The pallid bat is usually found in low to middle elevation habitats below 6000 feet (Philpott 1997); however, the species has been found up to 10,000 feet in the Sierra Nevada (Sherwin pers. comm. 1998). A variety of habitats are used, including grasslands, shrublands, woodlands, and coniferous forests (Philpott 1997). At Yosemite National Park, reproductive populations have been detected in giant sequoia groves (Pierson et al. 2006). It was one of the species most commonly encountered in giant sequoias in Giant Forest, Sequoia National Park (Pierson and Heady 1996). They are yearlong residents in most of their range and hibernate in winter near their summer roost (Zeiner et al.1990). Occasional forays may be made in winter for food and water (Philpott 1997).

Day roosts may vary but are commonly found in rock crevices, tree hollows, mines, caves and a variety of human-made structures. Tree roosting has been documented in large conifer snags, inside basal hollows of redwoods and giant sequoias, and bole cavities in oaks (pers. comm. Sherwin 1998). Cavities in broken branches of black oak are very important and there is a strong association with black oak for roosting (pers. comm. Pierson 1996). Roosting sites are usually selected near the entrance to the roost in twilight rather than total darkness. The site must protect pallid bats from high temperatures as this species is intolerant of roosts in excess of 104 degrees Fahrenheit. Pallid bats are also very sensitive to roost site disturbance (Zeiner et al. 1990, Philpott 1997). Night roosts are usually more open sites and may include open buildings, porches, mines, caves, and under bridges (Philpott 1997, pers. comm. Sherwin 1998, Pierson et al. 1996).

The pallid bat is nocturnal and after sunset it emerges from the day roost to forage. Pallid bats feed primarily on large, ground-dwelling arthropods, particularly Jerusalem crickets and scorpions (Pierson et al. 2006).

Historic and Current Distribution

There have been few bat surveys in the Monument but pallid bats are presumed present within their elevation range. A study conducted in the Giant Forest area of

Sequoia National Park found the pallid bat to be one of the species most commonly associated with giant sequoias (Inventory of Bat Species in Sequoia and Kings Canyon National Parks and Devils Postpile National Monument). The entire Monument is within the mapped CWHR range for this species.

Risk factors

Pallid bats are very sensitive to disturbance of roosting sites. The loss of large trees or snags may reduce the availability of roost structures. Some researchers believe grazing may reduce the quality of foraging habitat (Chapman et al. 1994).The emergence and spread of white-nose syndrome, the pathogenic fungus (*Geomyces destructans*) that infects hibernating bats, has the potential to spread to California. Pallid bats may be at risk in the future from white-nose syndrome.

Management and Status

Pallid bats are listed as Sensitive Species in Region 5. There is no specific management direction for this species. Pallid bats are listed as a California species of special concern by the California Department of Fish and Game.

Effects

Direct Effects

This is a programmatic level FEIS with no proposed ground disturbing activities and therefore, no direct effects.

Indirect Effects

1. Vegetation Management: Vegetation management projects for fuels reduction and ecological restoration may affect pallid bat habitat by reducing the number of snags available for roosting. All of the alternatives would follow management direction to set the highest priority for fuels reduction activities in the WUI.

Alternative A—Alternative A would continue the existing direction in the 2001 SNFPA to locate fuels treatments across broad landscapes, so that the spread and intensity of wildfire is reduced. Using currently designated WUIs, there are 45,342 acres identified as defense zone (13 percent of land within the Monument) and 145,522 acres of threat zone (41 percent of land within the Monument). These areas have the highest priority for fuels treatments and have less stringent requirements for maintaining snags important to pallid bats than areas outside of WUIs.

In Alternative A the 2001 SNFPA standards and guidelines for snag retention are followed:

> *Retain the following numbers of large snags after fuels treatments except where: (1) snag removal is needed to address imminent safety hazards and (2) snag levels are reduced as a result of incidental loss to prescribed fire. In westside mixed conifer and ponderosa pine forest types, retain four of the largest snags per acre. In the red fir forest type, retain six of the largest snags per acre. In westside hardwood ecosystems, retain four of the largest snags (hardwood or conifer) per acre. Where standing live hardwood trees lack dead branches, retain six of the largest snags per acre, where they exist, to supplement wildlife needs for dead material. Use snags larger than 15 inches dbh to meet this standard. Evaluate snag density on a 10-acre basis. The defense zone of the urban wildland intermix zone and developed recreation sites are exempt from this standard and guideline*.

In old forest emphasis area (46 percent of the Monument)—*Retain all snags 15 inches or greater following stand-replacing events except to address imminent hazards to human safety.*

Alternative B—WUIs would be the same as in Alternative A. In addition, the TFETA comprised of 56,626 acres would be established along the border with the Tule River Reservation. The short-term loss of snags important to pallid bats would likely be higher in Alternative B than in Alternatives C, D, and E.

In Alternative B, snags would only be removed for safety reasons or ecological restoration. Snags near roads, campgrounds, and administrative facilities would more likely be removed. More snags would be expected across the landscape than in Alternatives A and E.

Alternative C—Alternative C would designate a WUI defense zone that extends approximately 300 feet from structures, developed recreation sites, and administrative sites. Approximately two percent of the Monument (8,344 acres) would be included in defense

zones. Assuming that fuels treatments would be concentrated in the WUIs, the short-term loss of snags important to pallid bats would be lower in Alternative C than in Alternatives A, B, E and F.

Snags would only be removed for safety reasons or ecological restoration. Snags near roads, campgrounds, and administrative facilities would more likely be removed. More snags would be expected across the landscape than in Alternatives A and E.

Alternative D—In Alternative D, designated WUI defense zone would cover approximately one percent of the Monument (4,619 acres). The number of acres expected to be treated in Alternative D is small compared to those that would be treated under the other alternatives. Therefore, the potential for short-term loss of snags important to pallid bats would be the lowest in Alternative D.

Snags would only be removed for safety reasons. Snags near roads, campgrounds, and administrative facilities would more likely be removed. More snags would be expected across the landscape than in and of the other alternatives.

Alternative E—The designated WUIs and fuels treatment strategy would be the same as in Alternative A (No Action). Therefore, the effects on pallid bat habitat are expected to be similar.

However, the snag retention guideline from the 1990 MSA (p. 89) is: "maintain a minimum average of 1.5 snags per acre in each compartment." Therefore, fewer snags would be required to be maintained across the landscape of the Monument than the other alternatives.

Alternative F—Alternative F would continue existing management direction to make fuels reduction activities in the current WUIs the highest priority. The size of the WUI defense and threat zones would be the same as in Alternatives A, B, and E. In addition the TFETA would be established. Alternative F would eliminate the standard and guideline from the 2001 SNFPA requiring retention of all conifer trees with a dbh of 30 inches or greater and hardwoods with a dbh of 12 inches or larger when implementing vegetation treatments. There would be a six-inch diameter limit within one to two acres of a nest tree for the northern goshawk and California spotted owl. There would be no diameter limit for the rest of the acreage in the PACs. The short-term loss of snags and large trees important to pallid bats would likely be higher in Alternative F than in the other alternatives due to the lack of diameter limits on tree felling. The long-term resiliency of habitat to stand-replacing events such as fire, insects, and disease may be improved following treatments for ecological restoration.

2. Recreation Impacts: Snags that are safety hazards are typically removed along roads and in developed recreation areas. This safety policy would generally impact a relatively narrow band of habitat normally within about 100 meters of the trail/road's edge or in developed recreation areas. Given that bat species are dispersed widely throughout their range and utilize a variety of vegetation types and roost structures, the loss of snags due to hazard tree removal would have limited effects on overall habitat quality.

Alternatives A, B, D, E, and F—Approximately 1,095 miles of roads and 202 miles of trails would continue to be utilized for recreation in Alternatives A, B, D, E, and F. Developed recreation sites would cover about 660 acres and dispersed camping would be permitted. Snags posing safety hazards would be removed as necessary along roads, trails, and in developed recreation sites.

Alternative C—Recreation opportunities in developed sites would be emphasized and increased. Dispersed camping outside of developed sites would be eliminated. Under Alternative C, the road and trail system providing recreation access would likely be reduced from the current transportation system. Therefore, snags would be removed from a smaller area and impacts to pallid bats would be less than in the other alternatives.

3. Special Management Areas: There are no special management areas for pallid bats.

Cumulative Effects

The cumulative effects analysis area for the pallid bat includes the southern Sierra Nevada from the Kings River to the Breckenridge Mountains at the southern edge of Sequoia National Forest and east to the Kern Plateau. This includes the Tule River Indian Reservation and portions of Sequoia and Kings

Canyon National Parks. This is an appropriate scale for determining cumulative effects to pallid bats, since it includes all suitable habitat potentially affected by implementation of an alternative of this FEIS. The cumulative effects time frame is the same as the other species analyzed in this document—20 years into the future. The cumulative effects of all past actions are incorporated into the existing condition.

Vegetation Management—Fuels reduction treatments that may impact pallid bat habitat are currently occurring and will continue to occur throughout the analysis area. Fuels treatments and removal of snags deemed safety hazards may reduce the number of snags available to pallid bats for roosting. These effects are generally focused near communities and other developed areas. The number of acres of pallid bat habitat likely to be impacted in the analysis area is small, given the constraints on treatments (funding, air quality, etc.).

Grazing-—Some portions of the mapped range of pallid bats in the southern portions of Sequoia National Forest are within grazing allotments. Grazing could reduce the quality of foraging habitat by reducing prey diversity and density (Chapman et al. 1994). These allotments are managed following Forest Service utilization standards designed to reduce adverse impacts. Grazing in Sequoia and Kings Canyon National Parks is limited to pack animals and is regulated to minimize adverse impacts.

Recreation Impacts—The Greenhorn Mountain and Breckenridge areas of Sequoia National Forest completed motorized travel route designation. In this process, motorized cross-country travel will be prohibited and some user created routes in suitable pallid bat habitat are being added to the National Forest Transportation System. Adverse impacts of motorized vehicles on pallid bats in this area will be reduced due to the elimination of cross-country travel on this portion of the Forest (USDA 2009).

Overall recreation visits within the analysis area are expected to continue to increase. More recreational use may increase the probability of disturbance to pallid bat roost sites.

Wildfires—Stand-replacing fires could significantly reduce roost structures and affect the distribution and abundance of prey species.

Determination

All Alternatives—It is my determination that all of the alternatives ***may affect individuals***, but are not likely to result in a trend toward Federal listing or loss of viability of pallid bats. Snags that are safety hazards would be removed in limited areas, slightly reducing habitat quality in a small portion of the available habitat for pallid bats. Alternative E has the greatest short-term risk to pallid bat roost habitat because of its limited snag retention requirements.

Townsend's Big-eared Bat–Effects

Townsend's big-eared bat (*Corynorhinus townsendii*)

Habitat Preferences and Biology

The Townsend's big-eared bat occurs throughout the west and is 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. In California, the species is typically found in low desert to mid-elevation montane habitats, although sightings have been reported up to 10,800 feet (Philpott 1997). Habitat associations include desert, native prairies, coniferous forests, mid-elevation mixed conifer, mixed hardwood-conifer forests, riparian communities, active agricultural areas and coastal habitat types (Kunz and Martin 1982, Pierson et al. 1991). The Mother Lode within the Sierra Nevada foothills has been known historically as the "heart of concentrations" (Pierson and Rainey 1996). Distribution of this species is strongly correlated with the availability of caves and cave-like roosting habitat. Populations have incurred serious declines over the past 40 years in parts of California.

Townsend's big-eared bats are year-round California residents. Individuals are very loyal to their natal sites and usually do not move more than 10 kilometers from a roost site (Pierson et al. 1991, Pierson and Rainey 1996). Townsend's big-eared bats roost within caves, abandoned mines, and buildings. Buildings must offer cave-like spaces in order to be suitable. This species is highly sensitive to roost disturbance. Night roosts may occur in more open settings,

including under bridges (Philpott 1997). Foraging associations include edge habitats along streams and areas adjacent to and within a variety of wooded habitats. Several studies have indicated that this species feeds primarily on moths.

Townsend's big-eared bats hibernate throughout their range in caves and mines where temperatures are 55 degrees Fahrenheit or less, but generally above freezing. Roost sites are usually in the cooler air near the cave or mine entrance (Barbour and Davis 1969, Kunz and Marten 1982). Individuals may move during winter in response to temperature change (Barbour and Davis 1969).

Historic and Current Distribution

The Townsend's big-eared bat occurs throughout the west, and is 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.

There have been few bat surveys across the Monument. Inventory of mining sites on the Western Divide District has verified the presence of Townsend's big-eared bats. This species has also been detected in the Windy Gulch Cave Complex.

Risk factors

This species is extremely sensitive to disturbance of roosting sites. It is possible that grazing reduces the quality of foraging habitat (Fellers and Pierson 2002). The emergence and spread of white-nose syndrome, the pathogenic fungus (*Geomyces destructans*) that infects hibernating bats, has the potential to spread to California. Townsend's big-eared bats may be at risk in the future from white-nose syndrome.

Management and Status

The Townsend's big-eared bat is listed as a California species of special concern by the California Department of Fish and Game. There is no specific management direction for this species. However, cave and mine closures have been modified to provide suitable access and egress for bats when occupancy has been verified.

Effects

Direct Effects

This is a programmatic level FEIS with no proposed ground disturbing activities and therefore, no direct effects.

Indirect Effects

1. Vegetation Management: Since Townsend's big-eared bats depend primarily on caves and mines for roosting habitat, there is little chance of adverse effects from fuels reduction or ecological restoration projects.

2. Recreation Impacts: None of the alternatives propose expanding recreational access to caves or mines.

3. Special Management Areas: There are no special management areas for Townsend's big-eared bats, but several caves and mines in the Monument are gated or closed to unregulated access.

Cumulative Effects

The cumulative effects analysis area for the Townsend's big-eared bat includes the southern Sierra Nevada from the Kings River to the Breckenridge Mountains at the southern edge of Sequoia National Forest and east to the Kern Plateau. This includes the Tule River Indian Reservation and portions of Sequoia and Kings Canyon National Parks. This is an appropriate scale for determining cumulative effects to Townsend's big-eared bats since it includes all suitable habitat potentially affected by implementation of an alternative of this FEIS. The cumulative effects time frame is the same as the other species analyzed in this document—20 years into the future. The cumulative effects of all past actions are incorporated into the existing condition.

Vegetation Management—Fuels treatment or other vegetation management activities are unlikely to affect Townsend's big-eared bats since this species depends primarily on caves and mines for roosting habitat.

Grazing—Some portions of the mapped range of Townsend's big-eared bats in the southern portions of Sequoia National Forest are within grazing allotments. Grazing could reduce the quality of foraging habitat

by reducing prey diversity and density (Chapman et al. 1994). These allotments are managed following Forest Service utilization standards designed to reduce adverse impacts. Grazing in Sequoia and Kings Canyon National Parks is limited to pack animals and is regulated to minimize adverse impacts.

Recreation Impacts—The Greenhorn Mountain and Breckenridge areas of Sequoia National Forest completed motorized travel route designation. Opportunities to access potential Townsend's big-eared bat roost sites will be reduced by the elimination of cross-country travel in this portion of the Forest (USDA 2009).

Overall recreation visits within the analysis area are expected to increase. More recreational use may increase the probability of disturbance to Townsend's big-eared bat roost sites.

Wildfires—Stand-replacing fires could affect the distribution and abundance of prey species.

Determination

All Alternatives—It is my determination that all of the alternatives would have ***no effect*** on Townsend's big-eared bats. There are no proposed changes in the management of caves or mines, which would continue to be protected with gates or closures. Vegetation management projects are unlikely to adversely affect habitat for this species.

Western Red Bat–Effects

Western Red Bat (*Lasiurus blossevillii*)

Habitat Preferences and Biology

Western red bats occur throughout California in elevations up to 3,000 feet, excluding desert habitat (Tatum 1998). Populations are scattered and considered rare throughout the state (Philpott 1997). This species is found primarily in riparian and wooded habitats, particularly in willows, cottonwoods, and sycamores (Bolster 1998).

Western red bats are highly migratory between their summer and winter range, although migratory patterns are not well documented, and winter behavior is poorly understood. However, it is known to winter in the San Francisco area and to the south, and has been observed hibernating in leaf litter (Brown and Pierson1996). The timing of migration for males and females seems to differ, although groups tend to migrate together (Bolster 1998).

Western red bats are typically solitary. Roosting has been observed in caves, but generally western red bats roost singly within tree foliage or shrubs, and often along edge habitat adjacent to streams or open fields. Colonies are not formed. Roost sites are generally hidden from view from all directions except from below. The lack of obstruction from below allows the bat to drop downward for flight. Roost sites usually have dark ground cover to minimize solar reflection, have nearby vegetation to reduce wind and dust, and are generally located on the south or southwest side of a tree (Bolster 1998). Females give birth in June to one to five young per year with an average of 2.3 (Brown and Pierson 1996, Bolster 1998).

Foraging is generally at high altitudes over the tree canopy and begins one to two hours after sunset. Although solitary roosters, western red bats forage in close association with one another in the summer. Food items consist of a wide variety of flying insects including homopterans, coleopterans, hymenopterans, dipterans, and lepidopterans (Bolster 1998), and are apparently based on size rather than type (Brown and Pierson 1996).

Historic and Current Distribution

There have been few bat surveys across the Monument. Pierson et al. (2006) found western red bats in the Mariposa Grove at Yosemite National Park. Although western red bats have not been specifically reported within the Monument, the CWHR mapped range for this species includes the western portion of Monument (Maps 14 and 15).

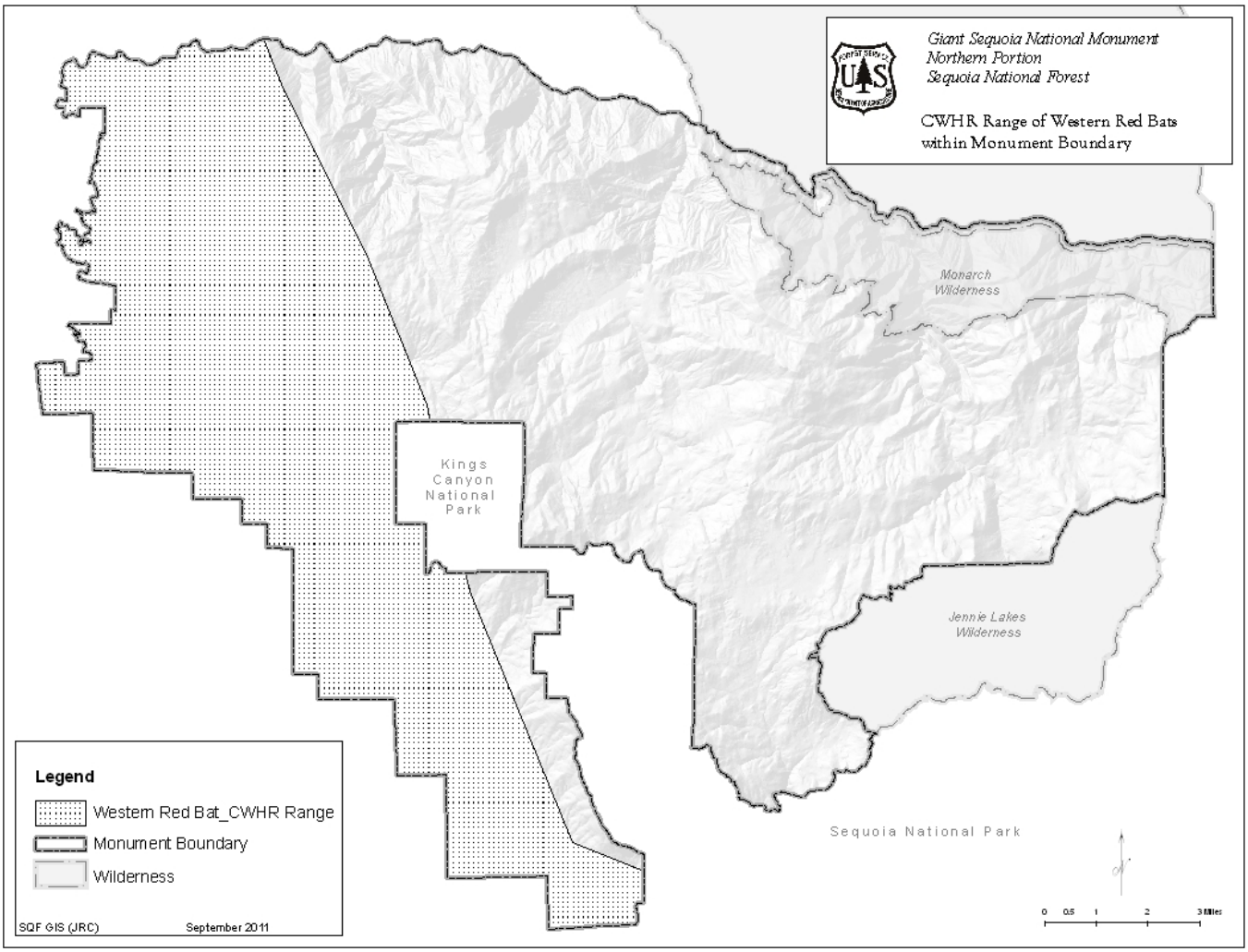
Threats

The primary threats to the western red bat are habitat loss and wind farm mortality. Overgrazing of riparian areas is a potential threat to habitat quality.

Management and Status

Western red bats are listed as Sensitive Species in Region 5. There is no specific management direction for this species. Western red bats are listed as a California species of special concern by the California Department of Fish and Game.

Map 14



Effects

Indirect Effects

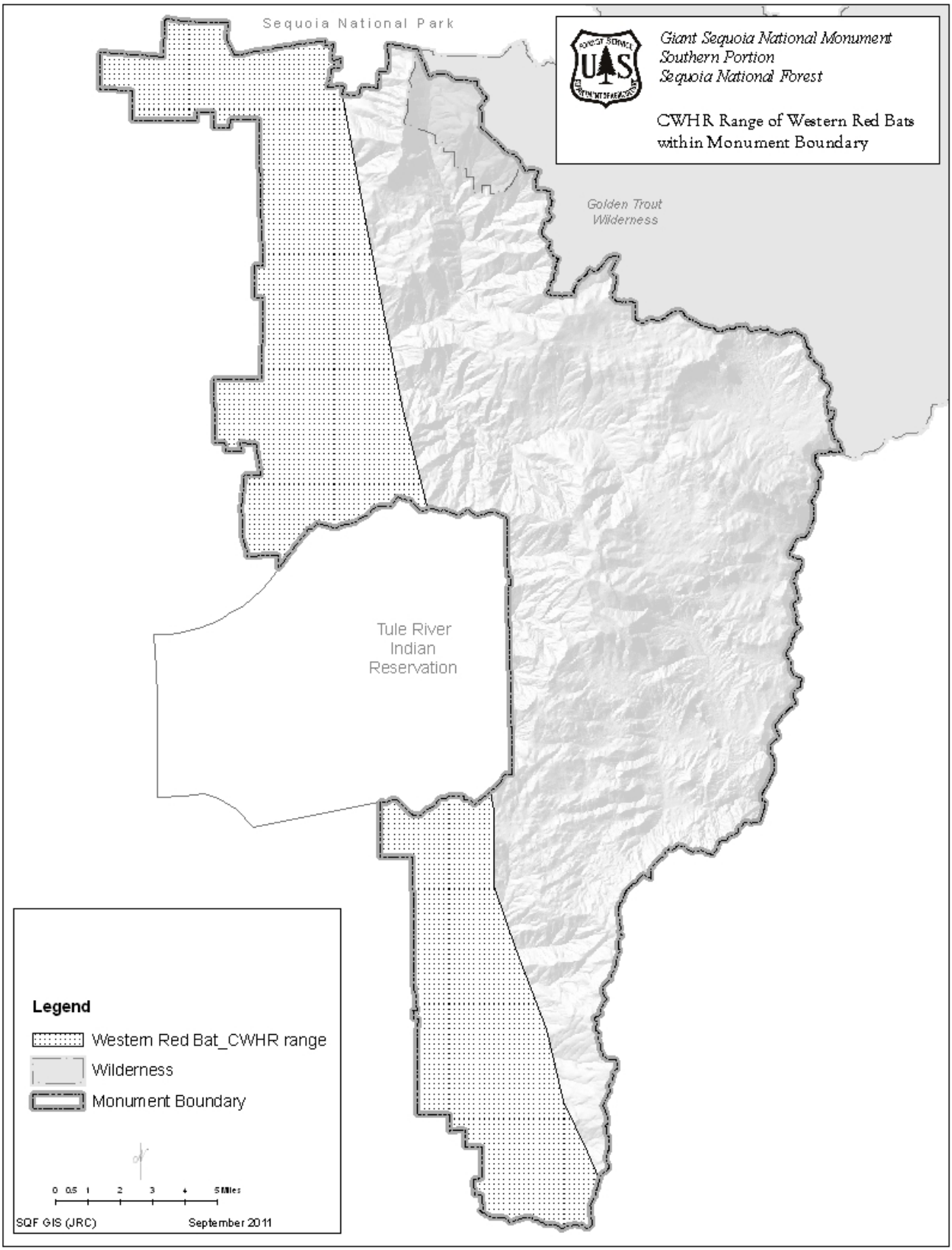
1. Vegetation Management: Vegetation management projects for fuels reduction and ecological restoration may impact western red bat habitat by removing key habitat features. All of the alternatives would follow management direction to set the highest priority for fuels reduction activities in the WUI.

Alternative A (No Action)—Alternative A would continue the existing direction in the 2001 SNFPA to locate fuels treatments across broad landscapes, so that the spread and intensity of wildfire is reduced. Within the mapped range of western red bats in the Monument there are currently 24,076 acres of defense zone (20 percent of the range) and 41,177 acres of threat zone (35 percent of range). These areas have the highest priority for fuels treatments which might remove habitat features important to western red bats.

Alternative B—WUIs would be the same as in Alternative A. In addition, the TFETA would include 19,464 acres in the CWHR range of western red bats. The short-term loss of habitat features important to western red bats would likely be higher in Alternative B than in Alternatives A, C, D, and E.

Alternative C—Alternative C would designate a WUI defense zone that extends approximately 300 feet from structures, developed recreation sites, and administrative sites. Approximately three percent of the CWHR range of western red bats in the Monument (3,962 acres) would be included in defense zones. Assuming that fuels treatments would

Map 15


Sequoia National Park
Giant Sequoia National Monument
Southern Portion
Sequoia National Forest
CWHR Range of Western Red Bats
within Monument Boundary
Golden Trout
Wilderness
Tule River
Indian
Reservation
Legend
Western Red Bat_CWHR range
Wilderness
Monument Boundary
0 0.5 1 2 3 4 5 Miles
SQF GIS (JRC)
September 2011

be concentrated in the WUIs, the short-term loss of habitat features important to western red bats would be lower in Alternative C than in Alternatives A, B, E, and F.

Alternative D—In Alternative D, designated WUIs would cover approximately two percent of the CWHR range of western red bats in the Monument (2,508 acres). The number of acres expected to be treated in Alternative D is small compared to those that would be treated in the other alternatives. Therefore, the potential for short-term loss of habitat features important to western red bats would be the lowest in Alternative D.

Alternative E—The designated WUIs and fuels treatment strategy would be the same as in Alternative A. Therefore, the effects on western red bat habitat are expected to be the same.

Alternative F—Alternative F would continue existing management direction to make fuels reduction activities in the current WUIs the highest priority. The size of the WUI defense and threat zones would be the same as in Alternatives A, B, and E. In addition the TFETA would be established. Alternative F would eliminate the standard and guideline from the 2001 SNFPA requiring retention of all conifer trees with a dbh of 30 inches or greater and hardwoods with a dbh of 12 inches or larger when implementing vegetation treatments. There would be a six-inch diameter limit within one to two acres of a nest tree for the northern goshawk and California spotted owl. There would be no diameter limit for the rest of the acreage in the PACs. The short-term loss of habitat features important to western red bats would likely be higher in Alternative F than in the other alternatives due to the lack of diameter limits on tree felling. The long-term resiliency of western red bat habitat to stand-replacing events such as fire, insects, and disease may be improved following treatments for ecological restoration.

2. Recreation Impacts: Risk factors for this species include loss or modification of roost structures (i.e. removal of roost trees, modification of cave or mine sites), or disturbance to roosting individuals.

Alternatives A, B, E, and F—The existing roads, trails and developed recreation sites would continue to be utilized in Alternatives A, B, E, and F. The effects to western red bats could include the loss of trees and snags if they pose safety hazards and are removed. Disturbance to roosting western red bats is possible near roads, trails, dispersed camping areas, or developed recreation sites.

Alternative C—Recreation opportunities in developed sites would be emphasized and increased. Dispersed camping outside of developed sites would be eliminated. Camping in more remote locations, in designated roadless areas, or in the Wildlands recreation niche setting would be allowed by permit. Under Alternative C, the road and trail system providing recreation access would likely be reduced from the current transportation system.

The risk of disturbance and loss of key habitat features for western red bats would be concentrated at the developed recreation sites. Overall effects to western red bats would be lower than in the other alternatives because of the elimination of dispersed camping, and the reduction of the road system. Fewer acres of potential western red bat habitat would be subjected to disturbance and loss of key features.

Alternative D—Recreation would be managed similarly to Alternatives A, B, E, and F except new recreation development would be limited and motorized use would be restricted to street-legal vehicles only.

The risk of disturbance to western red bat roost sites would be less than Alternatives A, B, E, and F because of the restrictions on vehicle types. The overall acres of western red bat habitat subject to disturbance would be more than Alternative C but disturbance at specific developed recreation sites would likely be lower.

3. Special Management Areas: There are no special management areas for western red bats.

Cumulative Effects

The cumulative effects analysis area for the western red bat includes the southern Sierra Nevada from the Kings River to the Breckenridge Mountains at the southern edge of Sequoia National Forest and east to the Kern Plateau. This includes the Tule River Indian Reservation and portions of Sequoia and Kings Canyon National Parks. This is an appropriate scale for determining cumulative effects to western red

bats, since it includes all suitable habitat potentially affected by implementation of an alternative of this FEIS. The cumulative effects time frame is the same as the other species analyzed in this document—20 years into the future. The cumulative effects of all past actions are incorporated into the existing condition.

Vegetation Management—Fuels reduction treatments that may impact western red bat habitat are currently occurring and will continue to occur throughout the analysis area. These treatments are generally focused near communities and other developed areas. Prescribed fire is a tool expected to be used throughout the area, with mechanical and hand thinning also occurring. The number of acres of western red bat habitat likely to be impacted in the analysis area is small, given the constraints on treatments (funding, air quality, etc.).

Grazing—Some portions of the mapped range of western red bats in the Sequoia National Forest are within grazing allotments. Overgrazing could reduce the quality of riparian habitat needed by this species. However, these allotments are managed following Forest Service utilization standards designed to reduce adverse impacts. Grazing in Sequoia and Kings Canyon National Parks is limited to pack animals and is regulated to minimize adverse impacts.

Recreation Impacts—The Greenhorn Mountain and Breckenridge areas of Sequoia National Forest completed motorized travel route designation. As a result of this process, motorized cross-country travel will be prohibited. Adverse impacts of motorized vehicles on western red bats in this area will be reduced due to the elimination of cross-country travel on this portion of the Forest (USDA 2009).

Overall recreation visits within the analysis area are expected to increase. More recreational use may increase the probability of disturbance to western red bats.

Wildfires—Large stand-replacing fires could significantly reduce roost structures and affect the distribution and abundance of prey species.

Determination

All Alternatives—It is my determination that all of the alternatives ***may affect individuals***, but are not likely to result in a trend toward Federal listing or loss of viability of western red bats. All of the alternatives would allow short-term reductions in habitat quality by removing trees, snags and down woody material; and there is a potential for disturbance of roosting sites, but only a small portion of the available habitat would be impacted. A maximum of 20 percent of this species' range in the Monument is in defense zones (the area most likely to receive vegetation treatments). In the long-term, vegetation treatments would result in a reduced chance of stand-replacing fires and improved forest resiliency which would benefit western red bats.

California Wolverine–Effects

California Wolverine (*Gulo gulo luteus*)

Habitat Preferences and Biology

Wolverines are generally a solitary species. Adults apparently associate only during the breeding season (Butts 1992). The basic spatial pattern for wolverines is intra-sexual territoriality, in which only the home ranges of opposite sexes overlap (Powell 1979). However, partial overlap of home ranges of some wolverines of the same sex is common (Ruggiero et al. 1994). Studies indicate home ranges in North America may vary from less than 38.6 to over 347.5 square miles, with males having larger territories than females. Individuals may move great distances on a daily basis: 15-30 miles a day is not uncommon for males and some individuals have moved 60-70 miles in a single day. Except for females providing for offspring, or males seeking mates, movement is generally motivated by food (Ruggiero et al. 1994). Although wolverines are primarily nocturnal, diurnal movement is often recorded. During summer, long distance movements appear to be restricted to night when temperatures are cooler (Hornocker and Hash 1976).

In the North Coast region, wolverines have been observed in Douglas-fir and mixed conifer habitats, and probably also use red fir, lodgepole, wet meadow, and montane riparian habitats (Schempf and White 1977; Zeiner et al. 1990). Habitats used in the northern Sierra Nevada include mixed conifer, red fir, and lodgepole pine. The species probably also uses

subalpine conifer, alpine dwarf-shrub, wet meadows, and montane riparian (White and Barrett 1979; Zeiner et al. 1990). In the southern Sierra Nevada, habitat preference includes lodgepole pine, red fir, mixed conifer, subalpine conifer, alpine dwarf-shrub, barren, and probably wet meadows, montane chaparral, and Jeffrey pine (ibid.).

White and Barrett (1979) stated that wolverines are highly dependent upon mature conifer forests for survival in winter, and generally move downslope in winter into heavier timber where food is available.

Wolverines are generally described as opportunistic omnivores in summer and primarily scavengers in winter (Ruggiero et al. 1994). In winter, most food is carrion, but large snowbound prey such as deer, elk, and moose, may also be killed. Wolverines cache food, and may be able to locate and retrieve prey under deep snow. During the summer, marmots, ground squirrels, gophers, mice, berries, insects, and even porcupines may be taken while foraging in open to sparse tree habitats on the ground, in trees, burrows, among rocks, and sometimes in shallow water (ibid; Zeiner et al. 1990).

Historic and Current Distribution

Historically, wolverine distribution in California included the North Coast Mountains and Sierra Nevada. A scarce resident in California, known habitat distribution occurred from Del Norte and Trinity counties east through Siskiyou and Shasta Counties, and south through the Sierra Nevada to Tulare County (Zeiner et al. 1990). In the northern Sierra Nevada, most sightings fall between 4,300-7,300 feet and between 6,400-10,800 feet in the southern Sierra Nevada (ibid.)

No verified sightings of wolverine have been documented on Sequoia National Forest in recent years, but detections of a single wolverine have been recently reported on the Tahoe NF (Moriarty et al. 2009). Aubry et al. (2007) found no other current records in California, despite concerted efforts to obtain verifiable evidence of wolverine occurrence using remote cameras and bait stations. There have been occasional unconfirmed reports of wolverine sightings within or adjacent to the Sequoia National Forest over the past 20 years; although most have been confined to remote areas in the Golden Trout Wilderness and Sequoia National Park. No detections of wolverines have been noted from extensive forest-wide surveys using track plate and camera methods, regional long-term monitoring for forest carnivores, or encountered through a systematic statewide survey. It is not likely that this species occurs in the Monument in any great density, if it is present at all.

Management and Status

In December 2010, the U.S. Fish and Wildlife Service determined that the distinct population segment of wolverine occurring in the contiguous United States is warranted for listing under the Endangered Species Act, but is precluded by higher priority actions to amend the Lists of Endangered and Threatened Wildlife and Plants. The contiguous U.S. Distinct Population Segment of the wolverine was added to the USFWS candidate species list. Wolverines are listed as threatened by the state of California.

Under 2001 SNFPA direction, if a wolverine sighting is verified, Forest Service management activities within a five-mile radius will be evaluated for potential disturbance. For a two-year period following the detection, an LOP of January 1-June 30 would be required for activities that would have an adverse effect.

Effects

Direct Effects

This is a programmatic level FEIS with no proposed ground disturbing activities and therefore, no direct effects.

Indirect Effects

1. Vegetation Management: Vegetation management projects for fuels reduction and ecological restoration may affect wolverine habitat by reducing canopy cover and removing key habitat features (large trees, snags, down woody debris).

Alternative A (No Action)—Alternative A would continue the existing direction in the 2001 SNFPA to locate fuels treatments across broad landscapes, so that the spread and intensity of wildfire is reduced. Using currently designated WUIs, there are 45,342 acres identified as defense zone (13 percent of the Monument) and 145,522 acres of threat zone (41 percent of the Monument). These areas have the

highest priority for fuels treatments and have less stringent requirements for maintaining habitat features important to wolverines than areas outside of WUIs.

Alternative B—WUIs would be the same as in Alternative A. In addition, the TFETA comprised of 56,626 acres would be established along the border with the Tule River Reservation. The short-term loss of habitat features important to wolverines would likely be higher in Alternative B than in Alternatives A, C, D and E.

Alternative C—Alternative C would designate a WUI defense zone that extends approximately 300 feet from structures, developed recreation sites, and administrative sites. Approximately two percent of the Monument (8,090 acres) would be included in defense zones. Assuming that fuels treatments would be concentrated in the WUIs, the short-term loss of habitat features important to wolverines would be lower in Alternative C than in Alternatives A, B, E, and F.

Alternative D—In Alternative D, the designated WUI defense zone would cover approximately one percent of the Monument (4,619 acres). The number of proposed acres that would be treated in Alternative D is small compared to those that would be treated under the other alternatives. Therefore, the potential for short-term loss of habitat features important to wolverines would be the lowest in Alternative D.

Alternative E—The designated WUIs and fuels treatment strategy would be the same as in Alternative A. Therefore, the effects on wolverine habitat are expected to be the same.

Alternative F—Alternative F would continue existing management direction to make fuels reduction activities in the current WUIs the highest priority. The size of the WUI defense and threat zones would be the same as in Alternatives A, B, and E. In addition the TFETA would be established. Alternative F would eliminate the standard and guideline from the 2001 SNFPA requiring retention of all conifer trees with a dbh of 30 inches or greater and hardwoods with a dbh of 12 inches or larger when implementing vegetation treatments. There would be a six-inch diameter limit within one to two acres of a nest tree for the northern goshawk and California spotted owl. There would be no diameter limit for the rest of the acreage in the PACs. The short-term loss of habitat features important to wolverines would likely be higher in Alternative F than in the other alternatives due to the lack of diameter limits on tree felling. The long-term resiliency of wolverine habitat to stand-replacing events such as fire, insects, and disease may be improved following treatments for ecological restoration.

2. Recreation Impacts: Wolverines are sensitive to the presence of humans and human activities (Claar et al. 1999, Grinnell et al. 1937). Recreation associated factors that may affect wolverines include reduction in down logs, disturbance, and vehicle collisions (Gaines et al. 2003). The rarity of wolverines in the Sierras and the lack of recent confirmed sightings in the Monument make adverse impacts from recreation activities extremely unlikely.

Alternatives A, B, E, and F—The existing roads, trails and developed recreation sites would continue to be utilized in Alternatives A, B, E, and F. The effects to wolverines could include the loss of trees and snags if they pose safety hazards and are removed. Disturbance to wolverines is possible near roads, trails, dispersed camping areas, or developed recreation sites.

Alternative C—Recreation opportunities in developed sites would be emphasized and increased. Dispersed camping outside of developed sites would be eliminated. Camping in more remote locations, in designated roadless areas, or in the Wildlands recreation niche setting would be allowed by permit. The risk of disturbance and loss of key habitat features for wolverines would be concentrated at the developed recreation sites. Overall effects to wolverines would be lower than in the other alternatives because of the elimination of dispersed camping. Fewer acres of potential wolverine habitat would be subjected to disturbance and loss of key features.

Alternative D—Recreation would be managed similarly to Alternatives A, B, E, and F except new recreation development would be limited and motorized use would be restricted to street-legal vehicles only. The risk of disturbance to wolverines would be less than Alternatives A, B, E, and F because of the restrictions on vehicle types. The overall acres of wolverine habitat subject to disturbance would be

more than Alternative C but disturbance at specific developed recreation sites would likely be lower.

3. Special Management Areas: There are currently no special management areas for wolverines in the Monument.

Alternatives A, B, C, D, and F—Alternatives A, B, C, D, and F would continue to follow the 2001 SNFPA guidelines to analyze and, if necessary, restrict activities that may have adverse effects in areas with confirmed wolverine detections.

Alternative E—Alternative E has no special protection for wolverines or their habitat.

Cumulative Effects

The cumulative effects analysis area for the wolverine includes the southern Sierra Nevada from the Kings River to the Breckenridge Mountains at the southern edge of Sequoia National Forest and east to the Kern Plateau. This includes the Tule River Indian Reservation and portions of Sequoia and Kings Canyon National Parks. This is an appropriate scale for determining cumulative effects to wolverines, since it includes all suitable habitat potentially affected by implementation of an alternative of this FEIS. The cumulative effects time frame is the same as the other species analyzed in this document—20 years into the future. The cumulative effects of all past actions are incorporated into the existing condition.

Vegetation Management—Fuels reduction treatments that may impact wolverine habitat are currently occurring and will continue to occur throughout the analysis area. These treatments are generally focused near communities and other developed areas unlikely to be inhabited by wolverines. The number of acres of potential wolverine habitat likely to be impacted in the analysis area is small, given the constraints on treatments (funding, air quality, etc.).

Recreation Impacts—Overall recreation visits within the analysis area are expected to continue to increase. More recreation use may increase the probability of disturbance to wolverines. However, Sequoia and Kings Canyon National Parks limit the number of campers in wilderness. These remote areas likely have the highest probability of occupation by wolverines in the analysis area.

Wildfires—Large stand-replacing fires have the potential to affect habitat suitability for wolverines by reducing canopy cover, decreasing prey abundance and removing den sites.

Determination

All Alternatives—It is my determination that all of the alternatives ***may affect individuals***, but are not likely to result in a trend toward Federal listing or loss of viability of wolverines. All of the alternatives would allow short-term reductions in habitat quality by removing trees, snags and down woody material; and there is a potential for disturbance to individuals, but in the long term, reduction in the chance of large stand-replacing fire and increases in forest resiliency would benefit wolverines and their prey species. The rarity of wolverines in the Sierras and the lack of recent confirmed sightings in the Monument make adverse impacts extremely unlikely.

American Marten–Effects

American Marten (*Martes americana*)

Habitat Preferences and Biology

American marten habitat includes mature moderately moist conifer forests interspersed with meadows, providing abundant small mammal prey, features for resting and denning, and sufficient canopy coverage for protection from avian predators (Buskirk and Ruggiero 1994). Conifer forest types important to American marten within the Sierra Nevada include red fir (*Abies magnifica*), lodgepole pine (*Pinus contorta*), subalpine conifer, mixed conifer-fir, Jeffrey pine (*Pinus jeffreyi*), and eastside pine (Simon 1980, Spencer 1981, Spencer et al. 1983, Zeiner et al. 1990, Cablk and Spaulding 2003), although Self and Kerns (2001) found American martens select white fir (*Abies concolor*) stands at lower elevations in northern California. In their study on the Tahoe National Forest (Sagehen Creek), Spencer et al. (1983) found American martens select riparian lodgepole pine stands at elevations below 6,726 feet and old-growth red fir stands above 6,726 feet. American martens were apparently using the lodgepole stands to hunt for Douglas squirrels.

Mature coniferous forests provide large-diameter trees and snags, large downed logs, and moderate to high

canopy closure, and interspersed riparian areas and meadows, important attributes for prime American marten resting, denning, and foraging habitat. American marten within the northern Sierra Nevada select stands with 40 to 60 percent canopy closure for both resting and foraging and avoid stands with less than 30 percent canopy closure (Spencer et al. 1983). Koehler et al. (1975) also stated that American marten avoid stands of less than 30 percent canopy closure, while Bull et al. (2005) found marten within northeast Oregon avoid stands with less than 50 percent canopy closure. American marten 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). In Yosemite National Park, American martens avoid areas lacking overhead cover and prefer areas with 100 percent overhead cover, especially when resting (Hargis and McCullough 1984). In contrast, Cablk and Spaulding (2002) snow-tracked American marten at the Heavenly Ski Resort (Lake Tahoe) and found that where they were detected, the mean canopy closure was only 30 percent as marten frequently crossed and foraged within open ski runs.

At the landscape scale, patches of preferred habitat and the distribution of open areas with respect to these patches may be critical to the distribution and abundance of American martens (Buskirk and Powell 1994). Small open areas, especially meadows, and regenerating stands (or plantations) are used by American marten as foraging habitat, but these openings are of optimum value when they occupy a small percent of the landscape and occur adjacent to mature forest stands meeting requirements for denning or resting habitat. In general, American marten appear to avoid landscapes with greater than 25 to 30 percent of the area in openings, even where suitable habitat connectivity exists (Chapin et al. 1998, Hargis et al. 1999). Poole et al. (2004) found American marten within British Columbia categorically avoid non-forested cover types, but they did extensively use young (less than 40 years of age) deciduous stands during the summer.

Various studies in the Sierra Nevada indicate that American martens have a strong preference for forest-meadow edges, and riparian forests appear to be important foraging habitats for voles (Spencer et al. 1983, Martin 1987). Voles are common in riparian zones and are important year-round prey for American marten within the Sierra Nevada (Zielinski et al. 1983, Zielinski 1984, Hargis and McCullough 1984, Martin 1987). Both Simon (1980) and Spencer (1981) found heavy American marten use along Sierra Nevada meadow edges. American marten preferred foraging in areas within 197 feet of a meadow, but avoided areas greater than 1,312 feet from a meadow and rarely ventured farther than 33 feet within a meadow (Spencer et al. 1983). Spencer et al. (1983) also found American martens prefer areas with an abundance of Douglas squirrel feeding sign. Kirk and Zielinski (2009) concluded that high-elevation, late seral forests appear important for American marten population persistence.

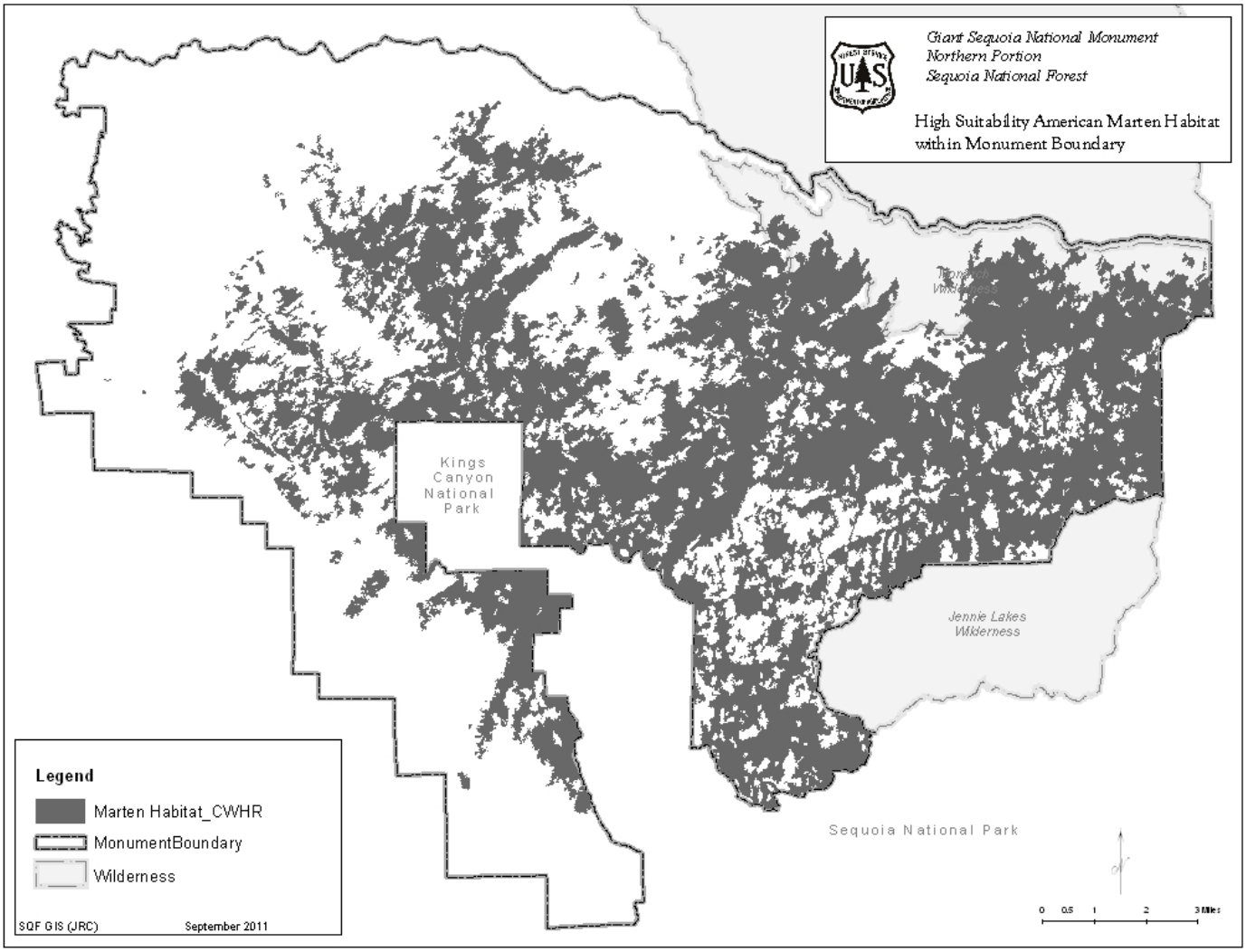
Dead and down material such as large snags, large downed woody material, and debris piles (especially near the ground) appear to provide protection from predators, prey sources, access to subnivean (below snow) spaces, and protective thermal microenvironments, especially in the winter (Buskirk and Powell 1994, Spencer et al. 1983, Thompson and Harestad 1994, Bull et al. 2005). Bull et al. (2005) found American marten within northeastern Oregon prefer habitats with high volumes of dead and down trees, and to avoid areas with low densities of dead trees. Sites used for subnivean entry have (1) greater percent cover of coarse woody debris, (2) greater total volume of coarse woody debris, (3) greater numbers of log layers, (4) greater volume of undecayed and moderately decayed logs, (5) less volume of very decayed logs, and (6) fewer small root masses than surrounding forest stands (Corn and Raphael 1992). Hence, large coarse woody debris (snags, downed logs, large branches, and root masses) are an important winter habitat component for both resting/denning and foraging.

Numerous food habits studies have been conducted across the range of American marten with approximately half indicating voles (*Microtus* spp. and *Clethrionomys* spp.) are a dominant food item (Martin 1994). *Microtus* also contribute to the diet of American marten within the Sierra Nevada (Zielinski et al. 1983, Zielinski 1984, Hargis and McCullough 1984, Martin 1987), but in some areas are apparently not as important as sciurids and deer mice (*Peromyscus* spp.) (Simon 1980, Zielinski and

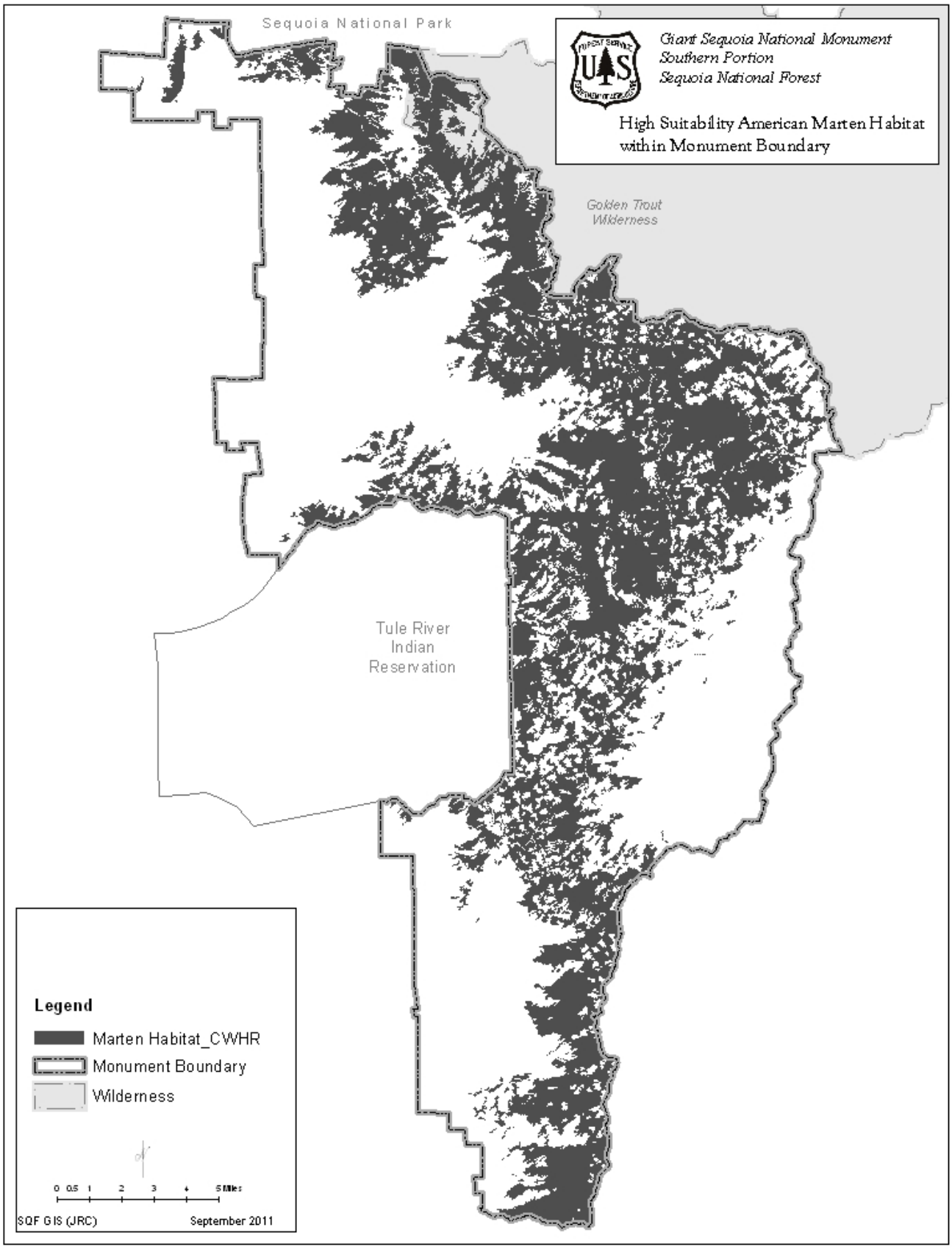
Duncan 2004). Douglas squirrels (*Tamiasciurus douglasii*) in particular may be highly important to American marten within California because of both their prevalence in the diet and their relatively high biomass compared to other prey items. However, the occurrence of voles versus tree squirrels in diet studies may also reflect the seasonal timing of the study. Zielinski et al. (1983) suggested that American martens within California switched over to Douglas squirrels when winter snows made voles more difficult to capture (and perhaps squirrels more vulnerable). Structural habitat complexity enhanced, rather than diminished, the efficiency of predatory search by martens (Andruskiew,et al. 2008).

Birds, mostly passerines, are also well represented in American marten diets within the Sierra Nevada (Zielinski et al. 1983, Hargis and McCullough 1984, Zielinski and Duncan 2004), although Zielinski (1986) cautions that birds are often over-represented in scat samples because of the durability of feathers compared to mammalian hair. Insects are also prevalent in American marten diets within the Sierra Nevada (Simon 1980, Martin 1987, Zielinski and Duncan 2004). Zielinski and Duncan (2004) found that nearly 21 percent of 150 scats collected on the Sequoia National Forest contained wasps (Vespidae/Eumenidae). Studies in Washington (Newby 1951) and Montana (Weckwerth and Hawley 1962) also found hornets (*Vespula* by Simon (1980) on the Inyo National Forest, however, suggest that while insects have a high occurrence, their biomass contribution is low, and possibly not significant. Plant material, including berries (*Ribes*), seeds (*Pinus*), and

Map 16



Map 17


Sequoia National Park
Giant Sequoia National Monument
Southern Portion
Sequoia National Forest
High Suitability American Marten Habitat
within Monument Boundary
Golden Trout
Wilderness
Tule River
Indian
Reservation
Legend
Marten Habitat_CWHR
Monument Boundary
Wilderness
0 0.5 1 2 3 4 5 Miles
SQF GIS (JRC)
September 2011

hypogeous fungi (mostly *Melanogaster* spp.) also show strongly in Sierra Nevada diets (Simon 1980, Hargis and McCullough 1984, Martin 1987, Zielinski and Duncan 2004). How much of this material is incidental ingestion originating in bird crops or rodent stomachs are unknown.

Parturition occurs between mid-March and late April. The young are reared in dens, and the mother moves the young among dens. The dens are important to recruitment and may represent a special habitat need (Ruggiero et al. 1994). American marten natal dens typically are found in cavities in large trees, snags, stumps, logs, burrows, caves, rocks, or crevices in rocky areas. The dens are lined with vegetation and occur in structurally complex, late successional forests (Buskirk and Ruggiero 1994). Post-natal dens are typically found in cavities, logs, underground, or in slash piles (Bull and Heater 2000). Canopy cover and the number of large old trees in these patches exceed levels available in the surrounding suitable habitat. The availability of habitat suitable for natal dens may limit reproductive success and population recruitment; this has direct repercussions on future population size (Buskirk and Ruggiero 1994).

In a study within the Monument, Zielinski et al. (1997) found 36 percent of the rest sites used by martens were in trees. Martens rested in conifers more often than hardwoods and tended to reuse rest sites with a frequency of 25.5 percent.

Habitat relationships for this species are defined by the CWHR models, which model habitat suitability for California's terrestrial vertebrates (CWHR 2005). The CWHR habitat stages that are moderately to highly important for American marten are: 4M, 4D, 5M, 5D, and 6, particularly within red fir, lodgepole pine, subalpine conifer, mixed conifer-fir, Jeffrey pine, and eastside pine (CWHR 2005). Using the CWHR model, there are 139,131 acres of high suitability habitat for American marten in the Monument (Maps 16 and 17).

In California, American marten were distributed throughout the Sierra Nevada and California Cascades, while the Humboldt marten (*M. a. Humboldtensis*) occurred in the Coast ranges, from the Oregon border southward to Sonoma County, primarily within the range of redwood (Sequoia sempervirens) and adjacent near-coast coniferous forest types. In a genetic study, Slauson et. al (2008) found American marten within the Sierra Nevada differed substantially from coastal populations of martens, suggesting marten populations were not a historically genetically homogeneous population and divergence may have occurred in separate glacial refugia.

American martens are currently distributed throughout the Sierra Nevada and Cascades (Buskirk and Zielinski 1997) between elevations of 5,500 to 10,000 feet, but most often found in the Sierra Nevada above 7,200 feet (Cablk and Spaulding 2002). For example, 81 percent of the 31 American marten detected over an eight-year study on the Stanislaus National Forest were record at elevations above 6,562 feet (T. Hofstra, pers. comm.). This distribution coincides with snowfall levels of greater than 9.1 inches per winter month (Krohn et al. 1997). The bulk of the American marten's Sierra Nevada distribution occurs on National Forest lands. Extensive American marten surveys have been conducted across Sequoia National Forest since 1991, with numerous detections throughout the Monument.

Risk factors

Martens are among the most habitat-specific mammals in North America (Buskirk and Powell 1994), and changes in the quality, quantity, and distribution of available habitat could affect their distributional range. Further, martens are predisposed to effects from human activities because they require the moderately moist, structurally complex, forest habitats that are preferred by humans for recreation.

Risks to marten habitat include activities that remove overhead cover, large-diameter trees, or coarse woody debris and activities that convert mesic to xeric sites with associated changes in prey communities (Campbell 1979). Although overhead cover is regenerated via plant successional processes, loss of coarse woody debris can only be ameliorated by artificial additions to the system or by the growth and decadence of new large-diameter trees (Buskirk and Ruggiero 1994).

In northern Utah, martens responded negatively to low levels of habitat fragmentation when the average distance between openings was less than 95

meters (317 feet; Hargis et al. 1999). Andren (1994) suggested that as landscapes become fragmented there is a negatively synergistic combination of increasing isolation and decreasing patch size of suitable habitat that compounds the results of simple habitat loss. For some species, this may result in a decrease of greater magnitude than can be explained solely by the loss of suitable habitat. Marten may be a species that demonstrates this pattern of exponential population declines at relatively low levels of fragmentation (Bissonette et al. 1997).

Roads can result in the direct and indirect mortality of individual American marten, as well as the degradation of habitat. Roads can fragment habitat and affect the ability of the animals to use otherwise suitable habitat on either side of the road, and the associated presence of vehicles and humans, can cause animals to avoid otherwise suitable habitats near roads. For example, Robitaille and Aubry (2000) found American martens to concentrate their activity away (greater than 300 m) from roads (although use near roads was not precluded). Vehicular collisions resulting in American marten mortality have been known to occur on the Monument. Most were associated with long paved stretches of road where vehicles tended to maintain higher speeds.

In a study conducted on the Lake Tahoe Basin Management Unit and Sierra National Forest, Zielinski et al. (2007) found that American marten occupancy or probability of detection did not change in relation to the presence or absence of motorized routes and OHV use when the routes (plus a 50 meter buffer) did not exceed about 20 percent of a 50 square kilometer area, and traffic did not exceed one vehicle every two hours. The study did not, however, measure behavioral changes or changes in use patterns and the study authors caution that application of their results to other locations would apply only if OHV use at the other locations is no greater than reported in their study.

Management and Status

The 2001 SNFPA requires the establishment of den site buffers that consist of 100 acres of the highest quality habitat in a compact arrangement surrounding American marten dens. There is currently one designated American marten den site buffer in the Monument (Map 18). Canopy closure retention guidelines for California spotted owls and northern goshawks maintain habitat characteristics also preferred by American marten. All suitable habitat for American martens in the Monument is within the SSFCA, which also requires the retention of habitat structures important to martens. The American marten is listed as a California species of special concern by the California Department of Fish and Game.

Effects

Direct Effects

This is a programmatic level FEIS with no proposed ground disturbing activities and therefore, no direct effects.

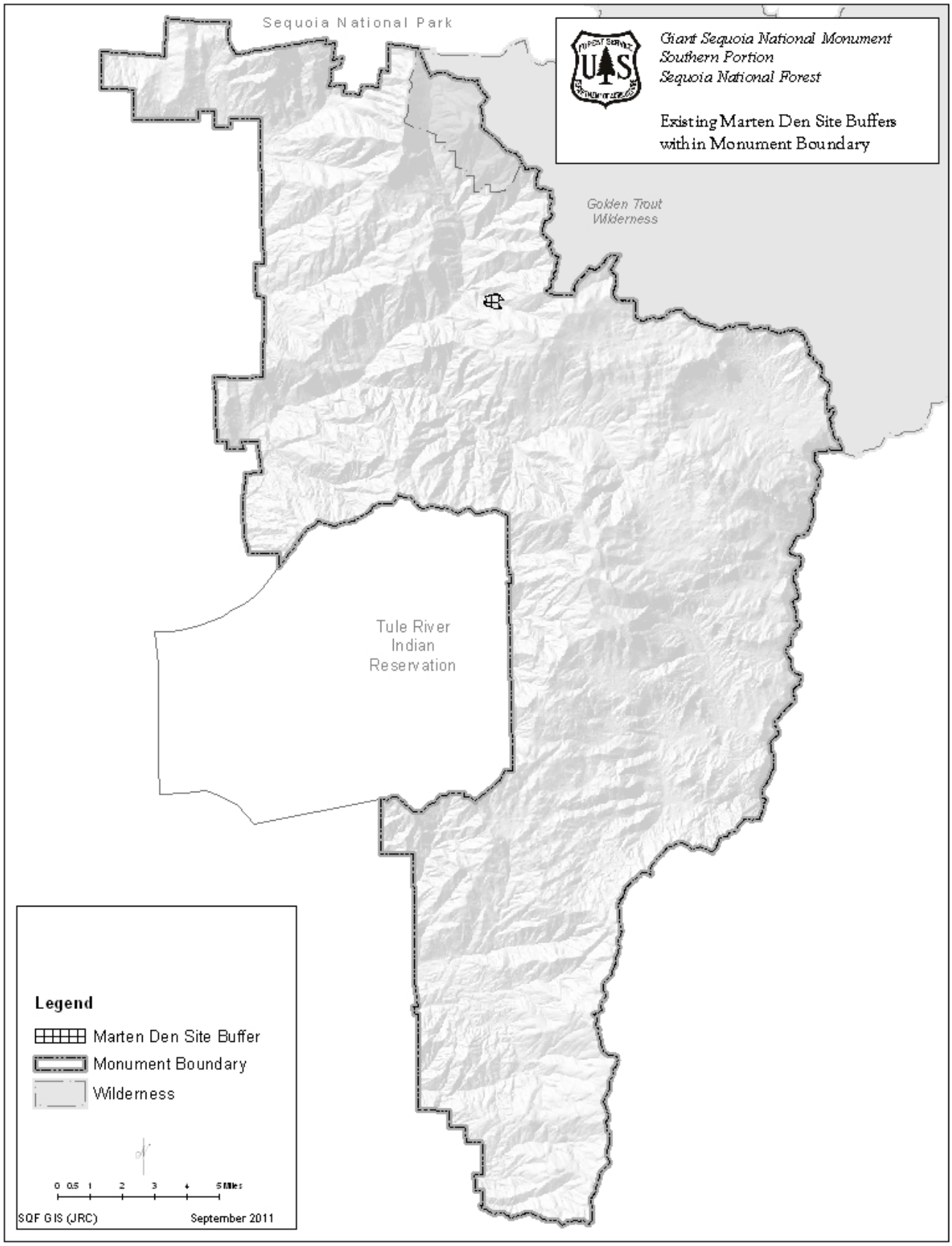
Indirect Effects

1. Vegetation Management: Vegetation management projects for fuels reduction and ecological restoration may affect American marten habitat by reducing canopy cover and removing key habitat features (large trees, snags, down woody debris).

Alternative A (No Action)—Alternative A would continue the existing direction in the 2001 SNFPA to locate fuels treatments across broad landscapes, in order to reduce the spread and intensity of fires. Within American marten habitat (using CWHR model), there are 13,394 acres identified as WUI defense zone (10 percent of marten habitat in the Monument) and 56,406 acres of WUI threat zone (41 percent of marten habitat in Monument). These areas have the highest priority for fuels treatments and have less stringent requirements for maintaining habitat features important to American marten than areas outside of WUIs.

Alternative B—WUIs would be the same as in Alternative A. In addition, the TFETA including 25,461 acres of American marten habitat would be established along the border with the Tule River Reservation. This would place an additional 13,744 acres of marten habitat that is not already in WUI, in a priority area for fuels reduction. The short-term loss of habitat features important to American marten would likely be higher in Alternative B than in Alternatives A, C, D, and E. In Alternative B, 60 percent of marten habitat in the Monument would be in one of the priority areas for fuels reduction.

Map 18


Sequoia National Park
Giant Sequoia National Monument
Southern Portion
Sequoia National Forest
Existing Marten Den Site Buffers
within Monument Boundary
Golden Trout
Wilderness
Tule River
Indian
Reservation
Legend
Marten Den Site Buffer
Monument Boundary
Wilderness
0 0.5 1 2 3 4 5 Miles
SQF GIS (JRC)
September 2011

Alternative C—Alternative C would designate a WUI defense zone that extends approximately 300 feet from structures, developed recreation sites, and administrative sites. Approximately 2,452 acres or two percent of the American marten habitat in the Monument would be within WUI defense zones. Assuming that fuels treatments would be concentrated in the WUIs, the short-term loss of habitat features important to American marten would be lower in Alternative C than in Alternatives A, B, E and F.

Alternative D—In Alternative D, approximately 1,243 acres or one percent of the American marten habitat in the Monument would be within the designated WUI defense zone. The number of proposed acres that would be treated in Alternative D is small compared to those that would be treated under the other alternatives. Therefore, the potential for short-term loss of habitat features important to American marten would be the lowest in Alternative D.

Alternative E—The designated WUIs and fuels treatment strategy would be the same as in Alternative A (No Action). Therefore, the effects on American marten habitat are expected to be the same.

Alternative F—Alternative F would continue existing management direction to make fuels reduction activities in the current WUIs the highest priority. The size of the WUI defense and threat zones would be the same as in Alternatives A, B, and E. In addition the TFETA would be established.

Alternative F would eliminate the standard and guideline from the 2001 SNFPA requiring retention of all conifer trees with a dbh of 30 inches or greater and hardwoods with a dbh of 12 inches or larger when implementing vegetation treatments. There would be a six-inch diameter limit within one to two acres of a nest tree for the northern goshawk and California spotted owl. There would be no diameter limit for the rest of the acreage in the PACs. The short-term loss of habitat features important to American martens would be higher in Alternative F than in the other alternatives due to the lack of diameter limits on tree felling. The long-term resiliency of American marten habitat to stand-replacing events such as fire, insects, and disease may be improved following treatments for ecological restoration.

2. Recreation Impacts: Recreation associated factors that may affect American martens include habitat fragmentation, disturbance, and vehicle collisions (Gaines et al. 2003).

Alternatives A, B, E, and F—The existing roads, trails, and developed recreation sites would continue to be utilized in Alternatives A, B, E, and F. The effects to American martens could include the loss of trees and snags if they pose safety hazards and are removed. Disturbance to American martens is possible near roads, trails, dispersed camping areas, or developed recreation sites.

Alternative C—Recreation opportunities in developed sites would be emphasized and increased. Dispersed camping outside of developed sites would be eliminated. Camping in more remote locations, in designated roadless areas, or in the Wildlands recreation niche setting would be allowed by permit. The risk of disturbance and loss of key habitat features for American martens would be concentrated at the developed recreation sites. Overall effects to American martens would be lower than in the other alternatives because of the elimination of dispersed camping and the restrictions on vehicle types. Fewer acres of potential American marten habitat would be subjected to disturbance and loss of key features.

Alternative D—Recreation would be managed similarly to Alternatives A, B, E, and F except new recreation development would be limited and motorized use would be restricted to street-legal vehicles only. The risk of disturbance to American martens would be less than Alternatives A, B, E, and F because of the restrictions on vehicle types. The overall acres of American marten habitat subject to disturbance would be more than Alternative C but disturbance at specific developed recreation sites would likely be lower.

3. Special Management Areas: American marten den site buffers are specific land allocations established to preserve key habitat characteristics and restrict project-related disturbance with LOPs. Several other land allocations, although not specifically aimed at protecting American martens, also protect marten habitat by maintaining canopy cover, large trees and down woody debris. These areas include: California spotted owl PACs, northern goshawk PACs, fisher den

site buffers, RCAs, CARs, old forest emphasis areas, and the SSFCA.

Alternatives A and B—Alternatives A and B would maintain the current American marten den site buffer and restrict management activities on 109 acres of high quality habitat near a known den site. In the future, as research continues, more den site buffers may be established in other areas of the Monument. An LOP of May 1-July 31 for activities within one-quarter mile of the den site would be required for most management activities.

In Alternatives A and B, fuel treatments within American marten den site buffers that are outside of WUIs would be avoided. Inside WUIs (currently 109 acres or 100 percent of existing American marten den buffers), if necessary to achieve fuels objectives, mechanical treatments of ladder and surface fuels over 85 percent of the treatment units would be permitted. Prescribed fire could be used if no other reasonable treatment method exists. LOPs would be implemented if necessary. No special management is proposed within the TFETA in Alternative B.

Outside of the WUI and within the SSFCA (62,293 acres or 45 percent of American marten habitat in the Monument), Alternative B would maintain requirements to retain 60 percent of watersheds in large trees and canopy cover greater than or equal to 60 percent. These restrictions would also apply to areas within the TFETA (in Alternative B), but not within WUI defense or threat zones. Inside of WUIs (76,709 acres or 55 percent of American marten habitat in the Monument), those restrictions would not apply. Within the limits imposed by the standards and guidelines, it is not known how many PACs/den buffers or acres will actually be treated in a given year. That would be based on project level decisions.

Habitat characteristics important to American martens would also be protected in California spotted owl PACs (22,651 acres), northern goshawk PACs (3,200 acres), fisher den site buffers (2,965 acres), RCAs, CARs (27,147 acres), and old forest emphasis areas (160,607 acres). Each of these land allocations has unique standards and guidelines which vary in the level of protection they provide for American marten habitat (see wildlife standards and guidelines, FEIS, Volume 2, Appendix A).

Alternative C—Alternative C would not include American marten den site buffers or other wildlife protection land allocations. Alternative C would evaluate the impacts of fuels reduction and restoration projects on American martens with BEs. LOPs appropriate for American martens would be utilized as needed.

Although there is no specific land allocation for the protection of American martens in Alternative C, management activities with the potential to negatively affect martens or their habitat are limited. WUI areas, where fuels reduction treatments will be focused, are smaller than in Alternatives A, B, E, and F and the number of acres expected to be treated is small, compared to Alternatives A, B, E, and F.

Alternative D—Alternative D would maintain the American marten den site buffer and restrict management activities on 109 acres of high quality habitat. It would also maintain California spotted owl PACs, northern goshawk PACs, fisher den site buffers, RCAs, and CARs. In Alternative D, the land allocations of SSFCA and old forest emphasis areas would be eliminated. Instead the entire Monument would be managed for wildlife, with particular emphasis on old forest dependent species.

Alternative D does not allow tree felling for fuels management or ecological restoration, only for safety concerns. The WUI area is less than the other alternatives and the number of acres expected for fuels treatment is smaller than the other alternatives. Therefore the short-term effects on American martens and their habitat are smaller in Alternative D than the other alternatives.

Alternative E—There would be no American marten den site buffers or other land allocations specifically protecting marten habitat in Alternative F. SOHAs on 24,707 acres would be maintained. However, SOHAs only restrict timber harvest from areas, which is not a management option because of the Clinton proclamation (2000). Alternative F only requires analysis of impacts “where projects are proposed impacting old growth stands” and consultation with the Department of Fish and Game concerning habitat protection for fur bearers.

Management of riparian areas would follow the 1988 Forest Plan and the 1990 MSA. There would be no

RCAs, CARs, or RCOs. Alternative E would have the least protection of riparian habitat.

Of the alternatives, Alternative E would allow the greatest amount of short-term American marten habitat loss and disturbance due to the lack of protected areas or an LOP.

Alternative F—Alternative F would maintain the current American marten den site buffer and restrict management activities on 40 acres of high quality habitat near a known den site. Vegetation treatments in den site buffers outside defense zones would be avoided. However, vegetation treatments inside defense zones would have no diameter limits. Therefore, there could be short-term losses to habitat quality in these areas. In the future, as research continues, more den site buffers may be established in other areas of the Monument. An LOP of May 1-July 31 for activities within one-quarter mile of the den site would be required for most management activities. Habitat characteristics important to American martens would also be protected in fisher den site buffers (2,965 acres), RCAs, CARs (27,147 acres), old forest emphasis areas (160,607 acres), and the SSFCA (333,542 acres). Each of these land allocations has unique standards and guidelines which vary in the level of protection they provide for American marten habitat (see wildlife standards and guidelines, FEIS, Volume 2, Appendix A).

Cumulative Effects

The cumulative effects analysis area for the American marten includes the southern Sierra Nevada from the Kings River to the Breckenridge Mountains at the southern edge of Sequoia National Forest and east to the Kern Plateau. This includes the Tule River Indian Reservation and portions of Sequoia and Kings Canyon National Parks. This is an appropriate scale for determining cumulative effects to American martens, since it includes all suitable habitat potentially affected by implementation of an alternative of this FEIS. The cumulative effects time frame is the same as the other species analyzed in this document—20 years into the future. The cumulative effects of all past actions are incorporated into the existing condition.

Vegetation Management—Fuels reduction treatments that may impact American marten habitat are currently occurring and would continue to occur throughout the analysis area. These treatments are generally focused near communities and other developed areas. Prescribed fire is a tool expected to be used throughout the area, with mechanical and hand thinning also occurring. The number of acres of American marten habitat likely to be impacted in the analysis area is small, given the constraints on treatments (funding, air quality, etc.).

Recreation Impacts—The Greenhorn Mountain and Breckenridge areas of Sequoia National Forest completed motorized travel route designation. As a result of this process, motorized cross-country travel will be prohibited and some routes in suitable American marten habitat are being added to the National Forest Transportation System. Adverse impacts of motorized vehicles on American martens in the analysis area will be reduced due to the elimination of cross-country travel in this portion of the Forest (USDA 2009).

Overall recreation visits within the analysis area are expected to increase. More recreation use may increase the probability of disturbance to American martens.

Wildfires—Increased fires, especially an increase in higher elevation fires, may result in a dramatic reduction in American marten habitat. Also, because of the American marten's declivity to cross large openings, large burns may fragment marten habitat and isolate populations leading to localized extinction. Finally, increased drying conditions will lead to further desiccation of meadow edges. Drier meadow edges would likely reduce populations of Microtus, a prey highly important to American marten within the Sierra Nevada.

Determination

All Alternatives—It is my determination that all of the alternatives ***may affect individuals***, but are not likely to result in a trend toward Federal listing or loss of viability of American martens. All of the alternatives would allow short-term reductions in habitat quality by removing trees, snags and down woody material; and there is a potential for disturbance to individuals, but only a small portion of the available habitat would be impacted. No more than 10 percent of suitable habitat is within defense zones (the areas most likely to receive vegetation treatments) in any of the alternatives. In

the long term, reduction in the chance of large stand-replacing fire and increases in forest resiliency would benefit American martens and their prey species. Additionally, modeling has shown increases in old growth habitat and in large trees (greater than 30 inches dbh) in the future for all of the alternatives (SPECTRUM model).

Pacific Fisher–Effects

Pacific Fisher (*Martes pennanti pacifica*)

Habitat Preferences and Biology

In the Sierra Nevada, fisher habitat occurs in mid-elevation forests (Grinnell et at. 1937, Zielinski et al. 1997) largely on National Forest System lands, below the elevations of national parks and wilderness areas. In the southern Sierra Nevada, fishers occur sympatrically with American martens (*Martes americana*) at elevations of 5,000 to 8,500 feet in mixed conifer forests (Zielinski et al. 1995). The Sierra Nevada status and trend monitoring project (USDA 2006) has detected fishers as low as 3,110 feet and as high as 9,000 feet in the southern Sierra Nevada, which are considered to be extremes of the elevation range.

Food habit studies by Grenfell and Fasenfest (1979) in northwestern California and Zielinski et al. (1999) in the southern Sierra Nevada show a wide diversity of prey. Common prey in both studies were squirrels (California ground squirrel [*Spermophilus beecheyi*], western gray squirrel [*Sciurus griseus*], and Douglas squirrel [*Tamiasciurus douglasii*]), mice (deer mouse [*Peromyscus spp.*], harvest mouse [*Reithrodontomys megalotis*], voles [*Microtus spp.*]), deer (*Odocoileus hemionus*) carrion, beetles, social wasps, and false truffles [*Rhizopogan spp.*]). Southern Sierra fishers also fed on alligator lizards (*Elgaria spp.*) and berries (*Ribes spp.*, *Arctostaphylos spp.*) (Zielinski et al. 1999), indicating that this most southern of fisher populations was exploiting a variety of food as well as relatively small prey species.

The following CWHR types were thought to be important to fishers: generally structure classes 4M, 4D, 5M, 5D and 6 (stands with trees 11 inches dbh or greater and greater than 40 percent cover) in ponderosa pine, montane hardwood-conifer, Klamath mixed-conifer, Douglas-fir, mixed conifer, montane riparian, aspen, redwood, red fir, Jeffrey pine, lodgepole pine, subalpine conifer, and eastside pine (Timossi 1990). CWHR assigns habitat values according to expert panel ratings. CWHR 2 is a derivative of the CWHR fisher habitat relationship model constructed by Davis et al. (2007). They used best available science to revise the statewide model and eliminate some forest types that appeared to contribute little to fisher habitat: aspen, eastside pine, lodgepole pine, montane riparian, red fir, and subalpine conifer. The model has been further refined to reflect only those forest types present in the southern Sierra Nevada: Jeffrey pine, montane hardwood-conifer, Ponderosa pine, Sierran mixed-conifer and white fir, terming it CWHR 2.1. Using the CWHR 2.1 model, there are 149,464 acres of moderate and high suitability habitat in the Monument (Maps 19 and 20).

Fishers tend to avoid large open areas. Weir and Corbould (2010) found that the probability of a home range area being occupied by fishers decreased with increasing amounts of open area. They concluded that "past and proposed forest harvesting can strongly affect the ability of the landscape to support fishers."

The reduction of understory vegetation in fuels reduction and silviculture treatments may reduce prey abundance and availability, as well as the availability of vegetative foods like berries and seeds. However, the recovery of understory vegetation takes less time than the development of other features important for fishers like large overstory trees and snags (Naney et al. 2012). Vegetation treatments that create within-stand heterogeneity of understory vegetation can increase habitat suitability for a number of species (Wilson and Puettmann 2007).

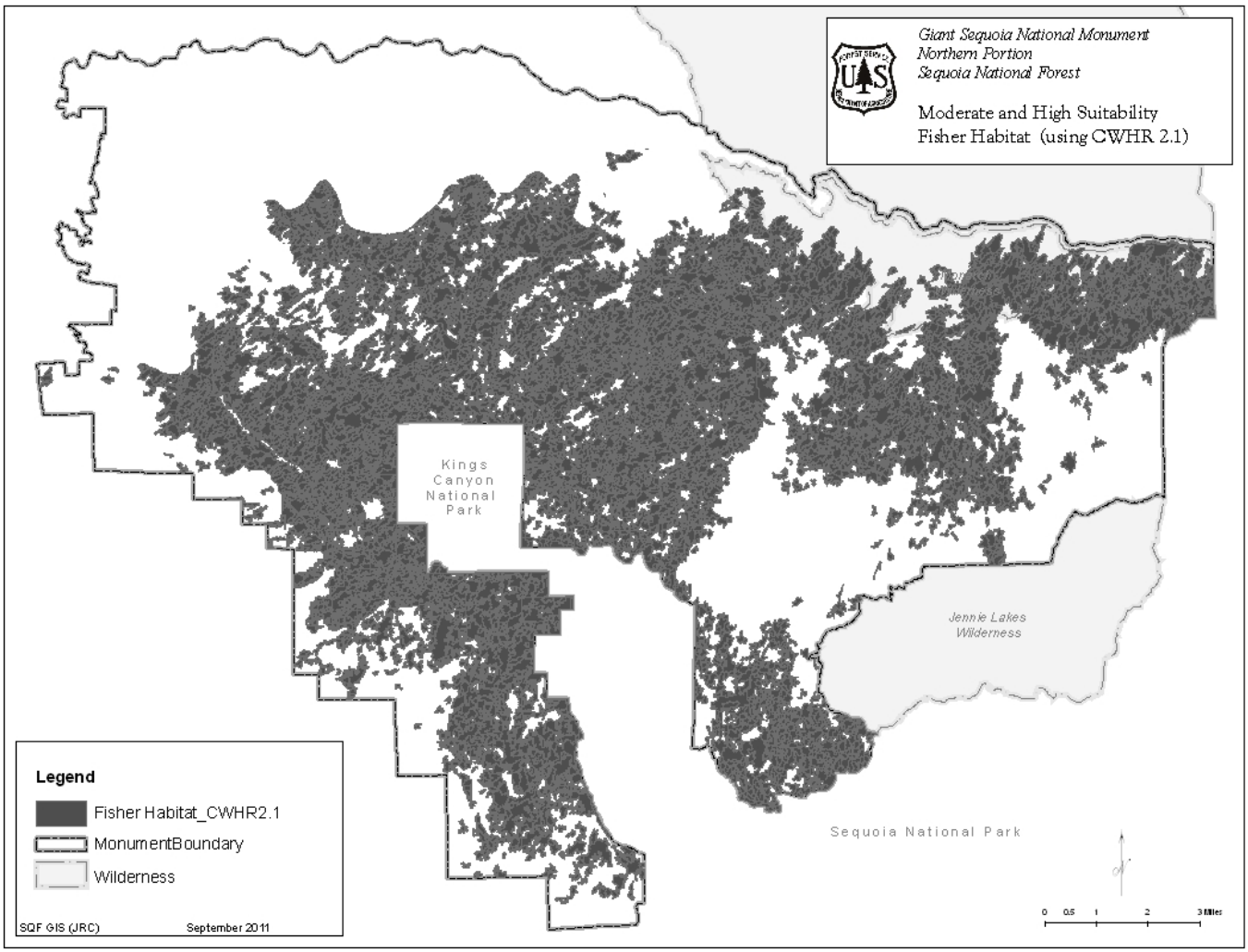
Fishers are among the most habitat-specific animals in North America, and changes in quality, quantity and distribution of available habitat can affect fisher distribution in California (Buskirk and Powell 1994). The southern Sierra Nevada mountain range provides habitat for the southernmost population of fishers in the world. Despite what appears to be historical isolation from populations to the north, the small southern Sierra fisher population has persisted for many decades (Spencer et al. 2008).

The maintenance of the southern Sierra fisher population may be critical to conserving fisher

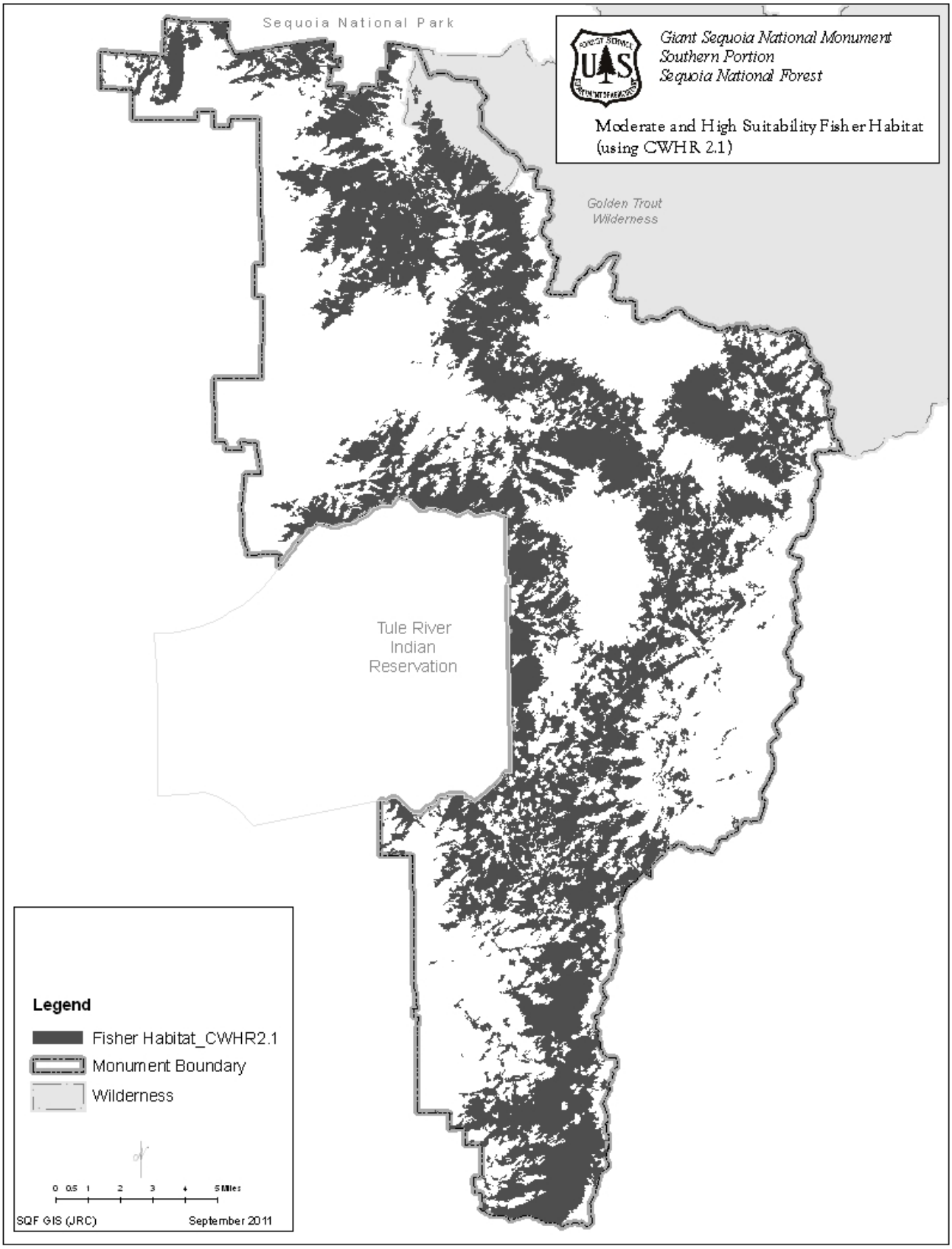
populations in the western United States (Zielinski 2004) because it appears to support unique genetic and behavioral adaptations to extreme environmental conditions for this species. Several studies have revealed genetic patterns that appear to arise from the disjunct nature of fisher population distributions in the Pacific States, and point to reduced genetic diversity in the southern Sierra Nevada population (Drew et al. 2003, Wisely et al. 2004). Wisely et al. (2004) analyzed fisher genetic samples available at that time to investigate the role of landscape features in fisher phylogeography in the narrow strip of suitable forested habitat in the southern Sierra Nevada. The study concluded that fisher expansion southward into the west coast mountain chains occurred less than 5,000 years ago, leading to reduced genetic diversity and increased population structure at the southern periphery of its range. This suggested that dispersal was limited, and aggressive conservation strategies are needed to reconnect extant populations. Consistent with this genetic analysis, the Kings River was postulated to constitute a major barrier to gene flow, and perhaps permeable to just one migrant every 50 generations (Wisely et al. 2004). The principles of conservation biology dictate that for a population to maintain genetic diversity there should be at least one migrant every 20 generations. Thus, these results were cause for significant concern.

More recently, about 163 additional fisher DNA samples have been analyzed as part of an on-going Master's thesis. In a progress report on this work, Tucker et al. (2009) discovered much higher levels of population connectivity in the southern Sierra Nevada. A cluster analysis using the program GENELAND (Guillot et al. 2005) signaled the presence of three

Map 19



Map 20


Sequoia National Park
Giant Sequoia National Monument
Southern Portion
Sequoia National Forest
Moderate and High Suitability Fisher Habitat
(using CWHR 2.1)
Golden Trout
Wilderness
Tule River
Indian
Reservation
Legend
Fisher Habitat_CWHR2.1
Monument Boundary
Wilderness
0 0.5 1 2 3 4 5 Miles
SQF GIS (JRC)
September 2011

intermixing population groupings: one in the far northwest portion of the Sierra National Forest, another encompassing the rest of Sierra National Forest through Sequoia/Kings Canyon National Park, and a southern third on the Sequoia National Forest (Tucker et al. 2009). Preliminary data indicate that at least one individual per generation moves from the northwest Sierra to the central population group, and up to 3.5 individuals per generation are interchanged between the central and southern genetic group, allaying concerns regarding presence of significant barriers to movement (Tucker et al. 2009). Thus, the Kings River does not appear to constitute a barrier to fisher movement, as previously proposed in Wisely et al. (2004). It should be emphasized that Tucker's work is ongoing and it is almost certain that the results and interpretations will change a bit in the continuing process. Nonetheless, the bottom line will remain that Wisely et al. (2004) were hampered by a very limited dataset.

In recent genetic work, Knaus et al. (2011) found that fishers in the southern Sierra are genealogically distinct from other fisher populations and likely were separated prior to the advent of modern land management practices.

Historic and Current Distribution

Grinnell et al. (1937) described the distribution of fishers in California as a continuous arc from the northern Coast Range eastward to the southern Cascades, and then south through the western slope of the Sierra Nevada, but did not attempt to estimate population numbers. Fisher historically occurred in the Lassen, Plumas, Tahoe, Lake Tahoe Basin, Eldorado, Stanislaus, Sierra, and Sequoia National Forests, but was not known to occur in the Modoc, Inyo or Humboldt-Toiyabe National Forests. As of 1995, Zielinski et al. determined that fishers remain extant in just two areas comprising less than half of the historic distribution: northwestern California and the southern Sierra Nevada from Yosemite National Park southward, separated by a distance of approximately 250 miles.

Sierra Nevada Population Status and Trend

Status and trend monitoring for fisher in the Sierra Nevada was initiated in 2002; the monitoring objective is to be able to detect a 20 percent decline in population abundance and habitat (USDA 2006). This monitoring includes intensive sampling to detect population trends on the Sierra and Sequoia national forests, where the fisher currently occurs, and is supplemented by less intensive sampling in suitable habitat in the central and northern Sierra Nevada specifically designed to detect population expansion.

From 2002-2008, 439 sites were surveyed throughout the Sierra Nevada on 1286 sampling occasions. Fishers have been detected at 112 of 251 (44.6 percent) sites sampled during the seven monitoring seasons (Truex 2009). Fishers have not been detected in the northern, central, or eastern Sierra. Preliminary proportions of number of sample sites with fisher detections divided by the number of sites surveyed are presented in Table 79. Using future data, the proportions will be adjusted based upon fisher delectability, potentially resulting in higher annual estimates than those reported here; annual estimates will be used to monitor trend (USDA 2006).

Table 84 Naïve Occupancy Rates or the Proportion of Primary Sample Units Detecting Fisher Across the Entire Fisher Monitoring Area (USDA 2006, Truex 2009)

Year	Fisher Detection Proportion
2002	0.252
2003	0.281
2004	0.207
2005	0.291
2006	0.276
2007	0.262
2008	0.241
2009	0.259

Preliminary results indicate that fishers are well-distributed in portions of the Sequoia and Sierra NFs; annual occupancy rates are consistently higher on the Sequoia than the Sierra (Table 80; USDA 2005).

Table 85 Naïve Occupancy Rates or the Proportion of Primary Sample Units Detecting Fisher by Area in the Sequoia and Sierra National Forests (USDA 2006, Truex 2009)

Year	Sequoia NF–West Slope	Sequoia NF–Kern Plateau	Sierra NF
2002	0.353	0.167	0.217
2003	0.483	0.133	0.200
2004	0.390	0.214	0.113
2005	0.514	0.294	0.155
2006	0.508	0.185	0.170
2007	0.540	0.222	0.142
2008	0.392	0.143	0.181
2009	0.514	0.462[(1)]	0.118

1 Sampling effort during 2009 was reduced on the Kern Plateau due to safety and operational considerations. Sampling was limited to the northern portion of the plateau and the observed occupancy is likely higher than it would otherwise have been if sampling had occurred throughout the area as in previous years (Truex, pers. comm.).

Risk factors

Threats to the West Coast Distinct Population Segment

The USFWS (2004) identified major threats to fishers in the West Coast Distinct Population Segment, discussed relative to specified factors for listing under Section 4 of the Endangered Species Act. Only those threats deemed by USFWS (2004) to be "important" to the entire West Coast DPS are summarized in this section. The reader is referred to the Federal Register for the complete USFWS 2004 discussion.

Factor A. The Present or threatened Destruction, Modification, or Curtailment of the Species' Habitats or Range: The extent of past and present timber harvest can fragment fisher habitat, reduce it in size, or change the forest structure to unsuitable for fishers. Both fuels reduction activities and effects of wildfire could result in loss and/or fragmentation of habitat. Development, recreation and roads also pose a threat of habitat loss/fragmentation as well as direct mortality. Research literature suggests that the loss and fragmentation of suitable habitat by roads may have played a role in the reduction of fisher from the central Sierra Nevada and its failure to re-colonize there.

Factor B. Overutilization for commercial, recreational, scientific or educational purposes: Historical trapping resulted in a severe population decline. Current mortalities or injuries from incidental trapping even where fisher trapping has been eliminated could be frequent and widespread enough to prevent population recovery or re-occupation of suitable habitat.

Factor C. Disease or predation: There is potential for disease outbreaks to occur in these small, isolated fisher populations with devastating effects. Mortality from predation by mountain lion, bobcat, coyote or large raptors could pose a significant threat to fishers.

Factor D. The inadequacy of existing regulatory mechanisms: Some protections are available, but highly variable from jurisdiction to jurisdiction, and limited. Current regulations fail to provide sufficient certainty that conservation efforts will be implemented or that they will be effective in reducing threats to fishers.

Threats to Fishers in the Southern Sierra Nevada

Uncharacteristically Severe Wildfire

Uncharacteristically severe wildfire is defined as fire occurring beyond the historical range of natural

variation in terms of scope, intensity and duration. These stand-replacing fires affect large areas of the landscape, decreasing or removing key fisher structural and habitat elements including large trees, overstory and understory canopy, vegetative diversity, snags, and logs. Landscape permeability for fisher movements at all scales may decrease as a result. As part of the threat evaluation completed for the West Coast Fisher Conservation Assessment (Lofroth et al. 2010), uncharacteristically severe wildfire ranked as a high threat in the southern Sierra Nevada geographic area.

Fragmented landscapes created by uncharacteristically severe wildfires will eliminate fisher habitat linkages, either permanently via vegetative type conversion or temporarily until recovery occurs. Landscape permeability to fishers is decreased. This results in detrimental impacts to fisher daily movements and energy balance, creates barriers to dispersal movements, affects the establishment of home ranges, and prolongs or prevents breeding season movements. These impacts may decrease fisher survival. Overall population fitness is affected by individual survival and mortality. Direct mortality as a result of fire may occur in extreme cases depending upon season (e.g. kit loss in reproductive season, loss of adults in fast-moving canopy firestorms).

Following wildfire, prey species abundance and community composition will shift. An initial increase in abundance of disturbance-adapted prey species may occur at the expense of species diversity with a gradual reversal of this trend as succession occurs. Although prey abundance may increase, prey availability will not necessarily follow due to fisher reluctance to enter open areas. Extensive burned areas can create dispersal barriers for prey. The West Coast Fisher Biology Team speculated that the abundance of prey available following fire may support pre-fire population levels of fishers that have been compressed into adjusted home ranges. This prey abundance may not persist over time, however, and result in displacement or loss of fishers on the margins of remaining habitat (Macfarlane, pers. comm.). Displaced individuals could create conspecific competition if packed into the remaining habitat, which could, in turn, increase disease transmission.

Large trees, snags and logs are used as resting structures (Purcell et al. 2009). Fishers exhibit strong selection for rest and den sites based upon forest structure and canopy cover. The basal area of medium/large snags was one of the top two variables (along with canopy cover) in predicting fisher use of rest sites. Changes in the frequency, abundance, and distribution of these habitat elements may create conditions inimical to successful reproduction, as well as survival of the young to recruitment into the population. Lack of well-distributed escape cover will result in increased predation.

It is unknown whether or to what extent fishers exhibit site fidelity. Habitat changes due to uncharacteristically severe wildfire could temporarily disrupt fisher social organization in a manner difficult to conceptualize (Macfarlane, pers. comm.). Resident animals may continue to occupy the burned area, but might not be replaced via recruitment of young into the population or via emigration of other adults upon their death. These socially-mediated population effects may be exhibited as a lag effect. That is, they may require an average fisher lifetime (10 or more years) under a statistically rigorous monitoring program for at least that period of time to become evident.

Management in post-fire areas will only occur to meet ecological restoration or human safety needs. Ecological restoration projects after fires must balance short-term and long-term ecosystem needs, including soil productivity and maintenance, water quality and quantity, tree resilience, management of current and future fuels (especially in WUIs), and restoration of the lost green forest habitat for species such as fisher, spotted owl, goshawk and marten, as well as providing the short-term or ephemeral post-fire habitat for snag-associated species.

Vegetation Manipulation to Reduce Risk of Uncharacteristically Severe Wildfire

Truex and Zielinski (2005) developed fisher resource selection functions (RSF) and resource selection probability functions (RSPF) as described in Zielinski et al. (2004a) to compare rest sites selected and track plate detections to areas not selected or sampled with no detections. These RSFs were used to estimate the change in fisher habitat suitability pre- to post-treatment in fuels reduction projects at two sites in

the Sierra Nevada. The remainder of this section discusses the results of the Truex and Zielinski (2005) study.

Four primary treatments were applied for effects assessment: control (no treatment); mechanical harvest (usually including mastication following harvest); mechanical harvest followed by prescribed burning; and area prescribed burning as the only treatment. Study areas were the Blodgett Forest Research Station (BFRS) and a satellite site at Sequoia-Kings Canyon National Park (SEKI).

This study generally concluded that fire and fire surrogate treatments have modest but significant short-term effects to the quality and availability of fisher resting habitat, as well as canopy closure. At BFRS, mechanical as well as mechanical plus fire treatments significantly reduced fisher resting habitat and average canopy closure. At the SEKI site, the late season burn treatment had a significant effect on fisher habitat suitability as well as canopy closure. The short-term treatment effects to foraging habitat at both sites were generally not significant. This may be explained by the broad spectrum of foraging habitat parameters, rendering it less likely to be a limiting factor to fisher than resting habitat.

Although the mechanical and mechanical/fire treatments had greater effects on fisher resting habitat suitability than prescription fire at BFRS, these effects can be mitigated by the ability of mechanical treatments to avoid individual habitat elements such as the critically important hardwoods as well as all large trees. The use of prescribed fire alone can be mitigated by raking debris away from key fisher structural elements in the habitat. The effect of greatest magnitude was a reduction in canopy closure. All treatments reduced canopy closure. Canopy closure, however, recovers relatively quickly compared to the loss of large dead or live trees. Re-measurements of treatment units in this study in five or 10 years will provide information on how quickly the canopy actually recovers.

Interpretation of these results needs to be cautious and informed by more data in the next decade. In areas where fisher habitat suitability is already low or marginal, the predicted effects may have a disproportionately large impact to habitat recovery. On the other hand, the short-term negative effects of the treatments may result in beneficial effects on subsequent stand development. Future monitoring will be needed to elucidate the exact nature of this relationship.

Another limitation of this study is that it focused upon effects at the individual stand level. As wide-ranging predators, fisher function at larger landscape scales within their habitats. Thus, it is important to analyze the spatial and temporal array of treatments in a landscape context. The more broadly distributed the treatments are over space and time, the lower the likelihood of significant negative effects in a landscape context. It does seem that such treatments distributed over space and time should have lower impacts than large-scale catastrophic wildfire.

One last caveat offered by Truex and Zielinski (2005) in interpreting the study results is to recognize that a reduction in habitat suitability does not necessarily equate to loss of suitability. Population level implications to localized reductions in habitat suitability have yet to be studied. To decrease effects to fisher habitat suitability, the authors recommend planning treatments to maintain elements important to fisher (e.g. large diameter hardwoods). Early season burns (mid-May or later) timed to follow the fisher denning period seem to have less impact to habitat. However, Purcell and Thompson (pers. comm.) have noted that by mid-May the kits still have relatively limited mobility; they are still largely dependent on the female until the end of August. Thus, to avoid potential conflict with denning, early season burns (spring burns) should occur prior to mid-March. Planning treatments to occur dispersed over space and time to the extent possible will minimize the effect to individual fishers.

Habitat Fragmentation or Loss of Connectivity

Habitat connectivity is a key to maintaining fisher within a landscape. Activities under Forest Service control that result in habitat fragmentation or population isolation pose a risk to the persistence of fishers. Timber harvest, fuels reduction treatments, road presence and construction, and recreational activities may result in the loss of habitat connectivity resulting in a negative impact on fisher distribution and abundance.

The level of route density and associated noise disturbance may influence how fishers utilize available habitat. This notion seems to be supported by a few recent studies that imply that fishers may favor occupancy of landscapes with lower road use or road density. Dark (1997) for example studied fishers in a well-roaded study area (i.e. areas without roads did not exist) on the Shasta-Trinity National Forest. The results suggested that fishers were detected more frequently at sites where roads were closed by the use of gates or otherwise designed to discourage vehicular traffic. Fishers used habitats with a greater density of low-use roads, and favored landscapes with more contiguous, unfrequented forests and less human activity. Campbell (2004, in USFWS 2004) noted that sample units examined within the central and southern Sierra Nevada region occupied by fishers were negatively associated with road density. Within the Monument, the road density in fisher habitat (using CWHR 2.1) is 2.0 miles of roads per square mile. Route density thresholds for fishers are not readily available in the literature.

Vehicular collisions resulting in fisher mortality have been reported at least incidentally. Heinemeyer (1993), for example, noted vehicular collision as a source of fisher mortality. Both the Sierra Nevada Adaptive Management Project and Kings River Project fisher studies on the Sierra National Forest have documented road collision mortalities. Instances of fisher mortality on Sequoia National Forest have also occurred with an estimated dozen collisions noted over the last 10 years. Most were associated with long paved stretches of road (like Highway 180) where vehicles tended to maintain higher speeds.

Volume III of Conservation of Fishers (Martes pennanti) in South-Central British Columbia, Western Washington, Western Oregon, and California 2012: A threat assessment for fishers in the Southern Sierra Nevada by a panel of experts rated uncharacteristically severe wildfire as a high threat. There were nine categories ranked as moderate threats, including: forest roads, wildfire suppression and rehabilitation activities, overstory reduction, understory reduction, reduction of structural elements, reduction in vegetation diversity, fragmentation, climate change, and uncharacteristic forest insect and disease (Naney et al. 2012).

Management and Status

The U.S. Fish and Wildlife Service determined that the West Coast population of fisher is warranted for listing under the Endangered Species Act of 1976, et seq., but precluded due to heavy agency workloads (USFWS 2004), and included it on the list of Endangered Species Act "Candidate" species.

Fishers are long-lived, have low reproductive rates, large home ranges (for carnivores of their size) and exist in low densities throughout their range (Powell 1993). This implies that fishers are highly prone to localized extirpation, colonizing ability is somewhat limited, and populations are slow to recover from deleterious effects. Isolated populations are therefore unlikely to persist.

The California Fish and Game Commission listed the fisher as a candidate for protection under the California Endangered Species Act in April 2009. In September 2010, the California Fish and Game Commission announced it would not protect the fisher under the California Endangered Species Act. However, the fisher is listed as a California species of special concern by the California Department of Fish and Game. The Forest Service has considered fishers to be a Sensitive Species in the Pacific Southwest Region since 1984 (Macfarlane 1994).

The 2001 SNFPA requires the establishment of fisher den site buffers that consist of 700 acres of the highest quality habitat in a compact arrangement surrounding verified birthing and kit rearing dens. Den site buffers established in the Monument are shown in Map 21. Fisher den site buffers have an LOP of March 1 to June 30 for all new projects. Canopy closure retention guidelines for California spotted owls and northern goshawks maintain habitat characteristics also preferred by fisher. All suitable habitat for fishers on the Monument is within the SSFCA, which requires the retention of habitat structures important to fishers.

A variety of tools are currently available for evaluating the effects of vegetation management projects on fisher habitat. The Fisher Analysis and Assessment Tool (FAST) has been developed by Diana Macfarlane of R5. Potential models include FRAGSTATS, and those discussed in Zielinski et al. 2004, 2006; Davis et al. 2007, Truex and Zielinski 2005, Spencer et al. 2008. The specific tools used for the evaluation are determined at the project level.

Effects

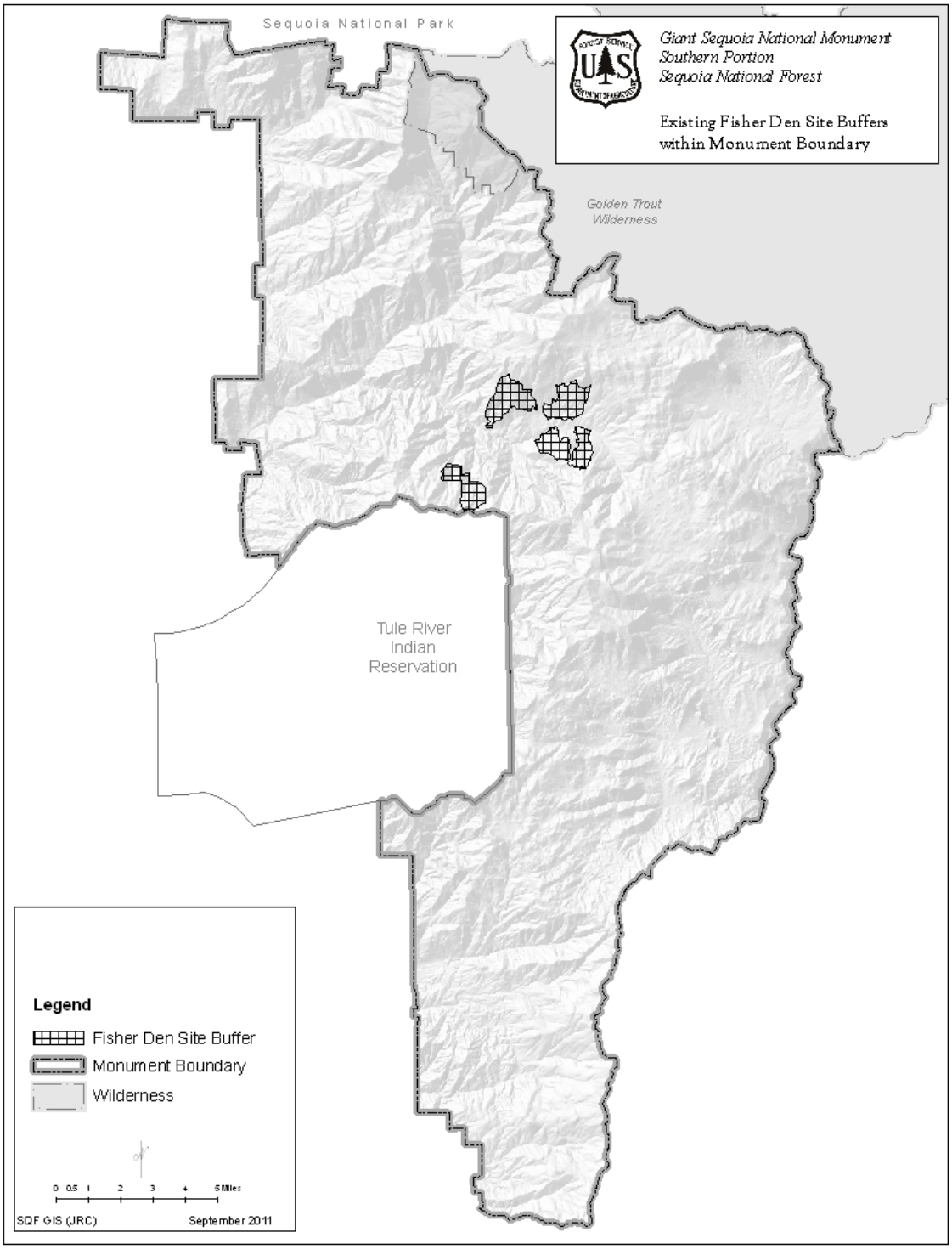
Direct Effects

This is a programmatic level FEIS with no proposed ground disturbing activities and, therefore, no direct effects.

Indirect Effects

1. Vegetation Management: Vegetation management projects for fuels reduction and ecological restoration may affect fisher habitat by

Map 21



reducing canopy cover and removing key habitat features (large trees, snags, down woody debris).

Alternative A (No Action)—Within fisher habitat (using CWHR 2.1), there are 21,107 acres identified as WUI defense zone (14 percent of fisher habitat in the Monument) and 60,062 acres of WUI threat zone (40 percent of fisher habitat in the Monument). These areas have the highest priority for fuels treatments and have less stringent requirements for maintaining habitat features important to fishers than areas outside of WUIs.

Alternative B—WUIs would be the same as in Alternative A. In addition, 23, 910 acres of fisher habitat (using CWHR 2.1) would be within the TFETA. This would place an additional 14,250 acres of fisher habitat that is not already in WUI, in a priority area for fuels reduction. The short-term loss of habitat features important to fishers would likely be higher in this alternative than in Alternatives A, C, D, and E. In Alternative B, 64 percent of fisher habitat in the Monument would be in one of the priority areas for fuels reduction.

Alternative C—Alternative C would designate a WUI defense zone that extends approximately 300 feet from structures, developed recreation sites, and administrative sites. Approximately 3,932 acres or three percent of the fisher habitat within the Monument would be within WUI defense zones. Assuming that fuels treatments would be concentrated in the WUIs, the short-term loss of habitat features important to fishers would be lower in Alternative C than in Alternatives A, B, E, and F.

Alternative D—In Alternative D, 2,146 acres or one percent of the fisher habitat within the Monument would be within the designated WUI defense zone. The number of proposed acres that would be treated in Alternative D is small compared to those that would be treated under the other alternatives. Therefore, the potential for short-term loss of habitat features important to fishers would be the lowest in Alternative D.

Alternative E—The designated WUIs and fuels treatment strategy would be the same as in Alternative A. Therefore, the effects on fisher habitat are expected to be the same.

Alternative F—Alternative F would continue existing management direction to make fuels reduction activities in the current WUIs the highest priority. The size of the WUI defense and threat zones would be the same as in Alternatives A, B, and E. In addition the TFETA would be established. Alternative F would eliminate the standard and guideline from the 2001 SNFPA requiring retention of all conifer trees with a dbh of 30 inches or greater and hardwoods with a dbh of 12 inches or larger when implementing vegetation treatments. There would be a six-inch diameter limit within one to two acres of a nest tree for the northern goshawk and California spotted owl. There would be no diameter limit for the rest of the acreage in the PACs. The short-term loss of habitat features important to fishers would likely be higher in Alternative F than in the other alternatives due to the lack of diameter limits on tree felling. The long-term resiliency of fisher habitat to stand-replacing events such as fire, insects, and disease may be improved following treatments for ecological restoration.

2. Recreation Impacts: Recreation associated factors that may affect fishers include habitat fragmentation, disturbance, and vehicle collisions (Gaines et al. 2003).

Alternatives A, B, E, and F—The existing roads, trails, and developed recreation sites would continue to be utilized in Alternatives A, B, E, and F. The effects to fishers could include the loss of trees and snags if they pose safety hazards and are removed along roads or in developed recreation sites. Disturbance to fishers is possible near roads, trails, dispersed camping areas, or developed recreation areas.

Alternative C—Recreation opportunities in developed sites would be emphasized and increased. Dispersed camping outside of developed sites would be eliminated. Camping in more remote locations, in designated roadless areas, or in the Wildlands recreation niche setting would be allowed by permit. Motorized use would be restricted to street-legal vehicles only.

The risk of disturbance and loss of key habitat features for fishers would be concentrated at the developed recreation sites. Overall recreation related impacts to fishers would be lower than in the other alternatives because of the elimination of dispersed

camping and the restrictions on the vehicle type. Fewer acres of fisher habitat would be subjected to disturbance and loss of key features.

Alternative D—Recreation would be managed similarly to Alternatives A, B, E, and F except new recreation development would be limited and motorized use would be restricted to street-legal vehicles only. The risk of disturbance to fishers would be less than Alternatives A, B, E, and F because of the restrictions on vehicle types. The overall acres of fisher habitat subject to disturbance would be more than Alternative C but disturbance at specific developed recreation sites would likely be lower.

3. Special Management Areas: Fisher den site buffers are specific land allocations established to preserve key habitat characteristics and restrict project-related disturbance with LOPs. Current den site buffers in the Monument are limited to the Tule River area where radio telemetry research has identified den sites. In the future, as research continues, more den site buffers may be established in other areas of the Monument.

Several other land allocations, although not specifically aimed at protecting fishers, also protect fisher habitat by maintaining canopy cover, large trees and down woody debris. These areas include: California spotted owl PACs, northern goshawk PACs, American marten den site buffers, RCAs, CARs, old forest emphasis areas, and the SSFCA.

Alternatives A and B—Alternatives A and B would maintain the 2001 SNFPA guidelines for fisher den site buffers and restrict management activities on 2,965 acres of high quality habitat near historic den sites. An LOP of approximately March 1 to June 30 for activities within den site buffers would be required for most management activities. Most of the Monument is within the SSFCA (333,542 acres). Standards and guidelines for this land allocation provide additional requirements for protecting habitat components important to fishers including canopy cover and large trees (see wildlife standards and guidelines, FEIS, Volume 2, Appendix A).

Fuel treatments would be avoided within fisher den site buffers that are outside of WUIs. Within the Southern Sierra Fisher Conservation Area, outside of WUIs (68,295 acres or 46 percent of fisher habitat in the Monument), there are requirements to retain large trees in 60 percent of the watersheds and to keep canopy cover greater than or equal to 60 percent. These restrictions would also apply to areas within the TFETA. Inside the WUIs (81,169 acres or 54 percent of fisher habitat in the Monument), these restrictions would not apply.

Habitat characteristics important to fishers would also be protected in California spotted owl PACs and HCRAs (44,500 acres), northern goshawk PACs (3,200 acres), American marten den site buffers (109 acres), RCAs, CARs (27,147 acres), and old forest emphasis areas (160,607 acres). Each of these land allocations has unique standards and guidelines which vary in the level of protection they provide for fisher habitat (see wildlife standards and guidelines, FEIS, Volume 2, Appendix A).

Alternative C—Alternative C would not include fisher den site buffers or other wildlife protection land allocations. Alternative C would evaluate the effects of fuels reduction and restoration projects on fishers with BEs. LOPs appropriate for fishers would be utilized as needed.

Although there is no specific land allocation for the protection of fishers in Alternative C, management activities with the potential to negatively affect fishers or their habitat are limited. WUI areas, where fuels reduction treatments will be focused, are smaller than in Alternatives A, B, E, and F and the number of acres expected to be treated is small, compared to Alternatives A, B, E, and F.

Alternative D—Alternative D would maintain the fisher den site buffers and restrict management activities on 2,965 acres of high quality habitat. It would also maintain California spotted owl PACs, northern goshawk PACs, American marten den site buffers, RCAs, and CARs. In Alternative D, the land allocations of SSFCA and old forest emphasis areas would be eliminated. Instead the entire Monument would be managed for wildlife, with particular emphasis on old forest dependent species.

Alternative D does not allow tree felling for fuels management or ecological restoration, only for safety concerns. The WUI area is less than the other alternatives and the number of acres expected for fuels treatment is smaller than the other alternatives.

Therefore the short-term effects on fishers and their habitat are smaller in Alternative D than the other alternatives.

Alternative E—There would be no fisher den site buffers or other land allocations specifically protecting fisher habitat in Alternative E. SOHAs on 24,707 acres would be maintained. However, SOHAs only restrict timber harvest from areas, which is not a management option because of the Clinton proclamation (2000). Alternative E only requires analysis of impacts "where projects are proposed impacting old growth stands" and consultation with the Department of Fish and Game concerning habitat protection for fur bearers.

Management of riparian areas would follow the 1988 Forest Plan and the 1990 MSA. There would be no RCAs, CARs, or RCOs. Alternative E would have the least protection of riparian habitat.

Of the alternatives, Alternative E would allow the greatest amount of short-term fisher habitat loss and disturbance due to the lack of protected areas or an LOP.

Alternative F—Alternative F would maintain the current fisher den site buffers. Vegetation treatments in den site buffers outside defense zones would be avoided. However, vegetation treatments inside defense zones would have no diameter limits. Therefore, there could be short-term losses to habitat quality in these areas. In the future, as research continues, more den site buffers may be established in other areas of the Monument. An LOP of March 1 to June 30 for activities within one-quarter mile of the den site would be required for most management activities. Habitat characteristics important to fishers would also be protected in American marten den site buffers (40 acres outside defense zone), RCAs, CARs (27,147 acres), old forest emphasis areas (160,607 acres), and the SSFCA (333,542 acres). Each of these land allocations has unique standards and guidelines which vary in the level of protection they provide for fisher habitat (see wildlife standards and guidelines, FEIS, Volume 2, Appendix A).

Cumulative Effects

The cumulative effects analysis area for the fisher includes the southern Sierra Nevada from the Kings River to the Breckenridge Mountains at the southern edge of Sequoia National Forest and east to the Kern Plateau. This includes the Tule River Indian Reservation and portions of Sequoia and Kings Canyon National Parks. This is an appropriate scale for determining cumulative effects to fishers since it includes all suitable habitat potentially affected by implementation of an alternative of this FEIS. The cumulative effects time frame is the same as the other species analyzed in this document—20 years into the future. The cumulative effects of all past actions are incorporated into the existing condition.

Vegetation Management—Fuels reduction treatments that may affect fisher habitat are currently occurring and would continue to occur throughout the analysis area. These treatments are generally focused near communities and other developed areas. Prescribed fire is a tool expected to be used throughout the area, with mechanical and hand thinning also occurring. The number of acres of fisher habitat likely to be affected in the analysis area is small, given the constraints on treatments (funding, air quality, etc.).

The Conservation Biology Institute conducted a computer simulation study of the interactions between fuels management, forest fires, fisher habitat, and the fisher population in the southern Sierra Nevada (Spencer et al. 2008). Their study area included this analysis area. Treating only two percent of the treatable landscape every five years (or up to 10 percent of the treatable landscape over 20 years) had no significant effect on fire or fishers at the landscape level, while treating four to eight percent of the treatable landscape every five years (or up to 20-32 percent of the treatable landscape over 20 years) was effective in reducing fire and benefiting fishers.

Both mechanical treatments and prescribed fire may reduce the quality of fisher habitat in the short-term (Truex and Zielinski 2005). However, mechanical treatments have the advantage of allowing greater control in protecting key habitat elements for fishers such as oaks, large snags, and down logs, which may be lost in a prescribed fire.

Recreation Impacts—The Greenhorn Mountain and Breckenridge areas of Sequoia National Forest completed motorized travel route designation. As a result of this process, motorized cross-country travel will be prohibited and some routes in suitable

fisher habitat will be added to the National Forest Transportation System. Adverse effects of motorized vehicles on fishers in this area will be reduced due to the elimination of cross-country travel in this portion of the Forest (USDA 2009).

Overall recreation visits within the analysis area are expected to increase. More recreation use may increase the probability of disturbance to fishers.

Wildfires—Large stand-replacing fires have the potential to make large areas of habitat less suitable for fishers by reducing canopy cover, decreasing prey abundance, and removing den and rest sites. Uncharacteristically severe wildfire ranked as a high threat to fisher habitat in the southern Sierra Nevada (Lofroth et al. 2010).

Determination

All Alternatives—It is my determination that all of the alternatives ***may affect individuals***, but is not likely to accelerate the trend toward Federal listing or result in loss of viability for the fisher. All of the alternatives would allow short-term reductions in habitat quality by removing trees, snags and down woody material; and there is a potential for disturbance to individuals, but only a small portion of the available habitat would be impacted.

No more than 14 percent of suitable habitat is within defense zones (the area most likely to receive vegetation treatments) in any of the alternatives. In the long term, reduction in the chance of large stand-replacing fire and increases in forest resiliency would benefit fishers and their prey species. Additionally, modeling has shown increases in old growth habitat and in large trees (greater than 30 inches dbh) in the future for all of the alternatives (SPECTRUM model).

Alternatives E and F would pose the greatest short-term risks to fishers, because Alternative F has the fewest restrictions on vegetation management activities and Alternative E lacks LOPs. Trees large enough to be den or rest sites could be removed in Alternatives E and F. Alternative D would have the lowest risk to fishers from management activities; however it may have a greater risk of large stand-replacing fires.

*A recent paper reclassifies this population in the Monument as the species Batrachoseps altasierrae, Greenhorn Mountains Slender Salamander (Jockusch et al. 2012).

Relictual Slender Salamander–Effects

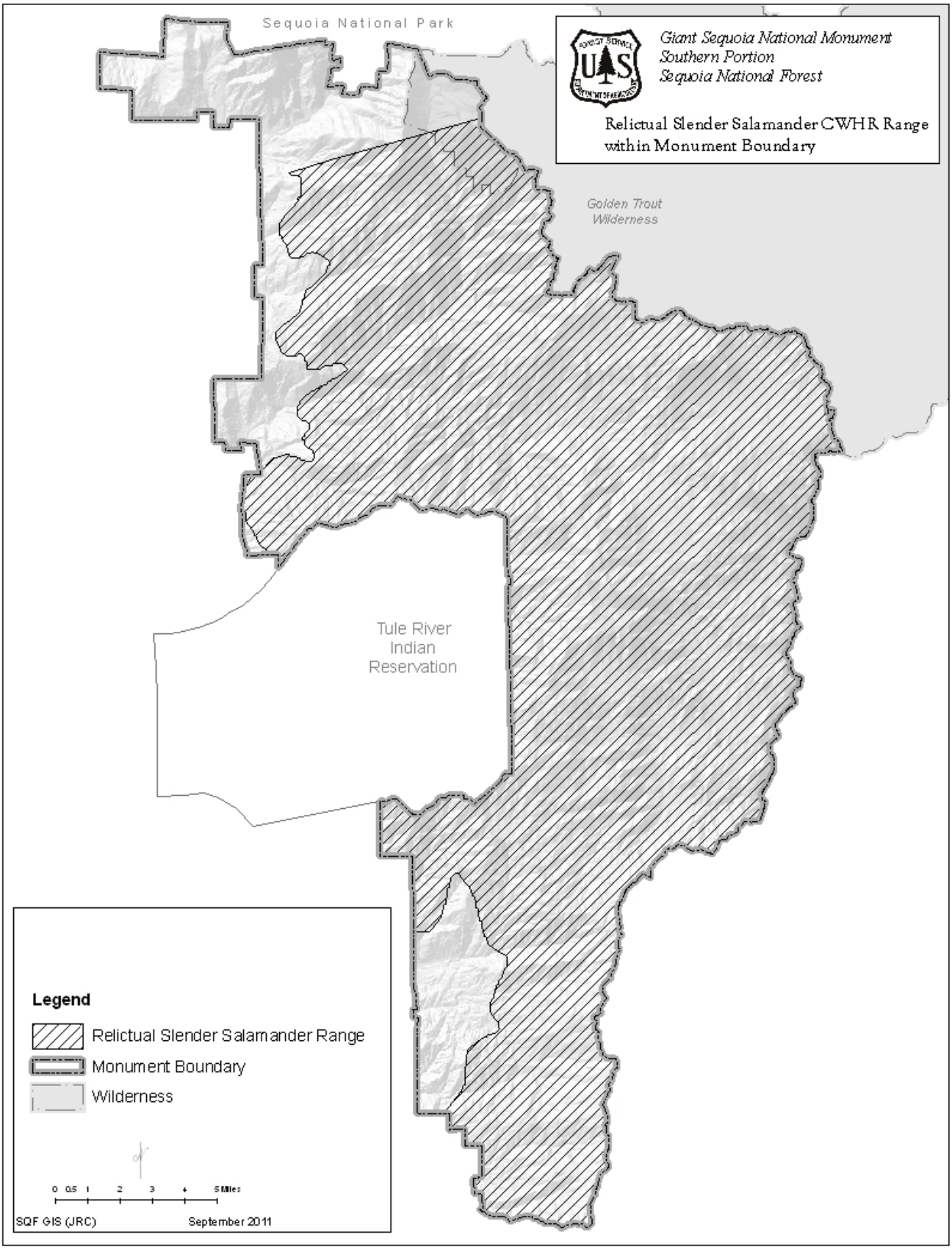
Relictual slender salamander (*Batrachoseps relictus*)*

Habitat Preferences and Biology

Relictual slender salamanders are most often associated with streamside zones, seeps/springs, meadows and moist wooded canyons in oak woodland and Sierra mixed conifer forests. Habitat for this species is often localized in relatively small, moderately moist sites that contain an overstory of trees or shrubs and abundant rocks, litter, or woody debris. Typical overstory species include Ponderosa pine, sugar pine, incense cedar, white fir, white alder, big leaf maple, canyon live oak and black oak. Relictual slender salamanders are present under surface cover only during periods of adequate soil moisture. In mid-elevation conifer forest, this may extend from April to November, especially for creek, seep or meadow margin populations. At lower elevations, the period of seasonal activity is shorter due to dry summer conditions, and typically extends from late fall rain events until May. Individual relictual slender salamanders move beneath the surface in burrows or rock rubble during dry periods and during the coldest winter months (Hansen 2006).

Home range information for this species has not been documented through scientific study, but it is thought to be small based on reviews of B. attenuatus, a similar species (Jennings and Hayes 1994). Studies with B. attenuatus showed movements limited to a mean of 1.5 meters (5 feet) from their home cover over two years, with 59 percent of the individuals found on repeated occasions under the same cover (Hendrickson 1954). Most reproductive activities are thought to occur underground. For mid-elevation areas courtship presumably occurs after the start of the rainy season in the fall, with egg-laying taking place in late November-December, depending on local rainfall and temperatures. Higher elevation sites (5,200-8,000 feet) experience a wide range of winter conditions, including moderate snowfall and below freezing temperatures well into spring. Breeding phenology of these populations is not well studied (Hansen 2006). Members of the genus *Batrachoseps* do not excavate burrows but generally rely on

Map 22


Sequoia National Park
Giant Sequoia National Monument
Southern Portion
Sequoia National Forest
Relictual Slender Salamander CWHR Range within Monument Boundary
Golden Trout Wilderness
Tule River Indian Reservation
Legend
Relictual Slender Salamander Range
Monument Boundary
Wilderness
0 0.5 1 2 3 4 5 Miles
SQF GIS (JRC)
September 2011

passages made by other animals, or produced by root decay or soil shrinkage. As with similar species, feeding occurs both above and below ground on earthworms, small slugs, and a variety of arthropods.

Historic and Current Distribution

The range of relictual slender salamanders is limited to the west slope of the Sierras from the Tule River drainage in Tulare County south to the Greenhorn Mountains and Kern River Canyon in Kern County. This species is found at elevation ranges of 1,500 feet in the lower Kern Canyon to 8,000 feet in Greenhorn Mountains (Hansen 2006). Relictual slender salamanders are endemic to California.

Populations of relictual slender salamanders appear to be stable, although no individuals have been found at the type locality in Lower Kern River Canyon since 1971 (Hansen 2006). The CWHR mapped range for this species encompasses most of the southern portion of the Monument (Map 22).

Risk Factors

Habitat alteration during road maintenance has been implicated in this specie's likely extirpation from the lower Kern River Canyon (Hanson 2006). The U.S. Fish and Wildlife Service recognized road construction and maintenance, residential and commercial development, livestock grazing, and mining as threats to the related Tehachapi slender salamander (USFWS 2009). Jennings (1996) stated that livestock grazing and timber harvest, if they severely altered habitat, could be threats to terrestrial amphibians.

Management and Status

There is no specific management direction for this species. RCA buffers of 300 feet on either side of perennial streams, meadows, seeps, and springs and 150 feet on either side of intermittent streams provide some protection to habitat by limiting effects from management projects. The relictual slender salamander is listed as a California species of special concern by the California Department of Fish and Game.

Effects

Direct Effects

This is a programmatic level FEIS with no proposed ground disturbing activities and therefore, no direct effects.

Indirect Effects

Little is known about the status of relictual slender salamanders within the Monument. To assess effects, it was estimated that approximately 33,227 acres of potential relictual slender salamander habitat exist within the Monument. This is based on buffers of 300 feet on either side of perennial streams and 150 feet on either side of intermittent streams, meadows, seeps, and springs within the CWHR mapped range for this species.

1. Vegetation Management: Vegetation management projects for fuels reduction and ecological restoration may affect relictual slender salamander habitat by reducing canopy cover, causing soil compaction, and removing down logs.

Alternative A (No Action)—Within potential relictual slender salamander habitat, there are 5,587 acres identified as WUI defense zone (17 percent of habitat in the Monument) and 15,490 acres of WUI threat zone (47 percent of habitat in the Monument). These areas have the highest priority for fuels treatments and are more likely to be affected than areas outside of WUIs.

Alternative B—WUIs would be the same as in Alternative A. In addition, 9,837 acres of relictual slender salamander habitat would be within the TFETA. The short-term loss of habitat features important to relictual slender salamanders would likely be higher in Alternative B than in Alternatives A, C, D, and E.

Alternative C—Alternative C would designate a WUI defense zone that extends approximately 300 feet from structures, developed recreation sites, and administrative sites. Approximately 1,009 acres or three percent of the relictual slender salamander habitat within the Monument would be within WUI defense zones. Assuming that fuels treatments would be concentrated in the WUIs, the short-term loss of habitat features important to relictual slender salamanders would be lower in Alternative C than in Alternatives A, B, E, and F.

Alternative D—In Alternative D, areas designated as WUIs would be smaller than in the other alternatives. The defense zone would be 200 feet from structures on National Forest System land or from the boundary

with private land, unless topographic circumstances dictate otherwise. In Alternative D, approximately 445 acres or one percent of the relictual slender salamander habitat within the Monument would be within the designated WUI defense zone. The number of proposed acres that would be treated in Alternative D is small compared to those that would be treated under the other alternatives. Therefore, the potential for short-term loss of habitat features important to relictual slender salamanders would be the lowest in Alternative D.

Alternative E—The designated WUIs and fuels treatment strategy would be the same as in Alternative A (No Action). Therefore, the effects on relictual slender salamander habitat are expected to be the same.

Alternative F—Alternative F would continue existing management direction to make fuels reduction activities in the current WUIs the highest priority. The size of the WUI defense and threat zones would be the same as in Alternatives A, B, and E. In addition the TFETA would be established. Alternative F would eliminate the standard and guideline from the 2001 SNFPA requiring retention of all conifer trees with a dbh of 30 inches or greater and hardwoods with a dbh of 12 inches or larger when implementing vegetation treatments. There would be a six-inch diameter limit within one to two acres of a nest tree for the northern goshawk and California spotted owl. There would be no diameter limit for the rest of the acreage in the PACs. The potential for short-term loss of habitat features important to relictual slender salamanders (e.g. canopy cover) would likely be higher in Alternative F than in the other alternatives due to the lack of diameter limits on tree felling. The long-term resiliency of habitat to stand-replacing events such as fire, insects, and disease may be improved following treatments for ecological restoration.

2. Recreation Impacts: Recreation associated factors that may affect relictual slender salamanders include habitat fragmentation, reduction in density of down logs due to their removal near roads or recreation sites, interference with dispersal, and mortality from vehicles hitting an animal.

Alternatives A, B, D, E, and F—The existing roads, trails and developed recreation sites would continue to be utilized in Alternatives A, B, D, E, and F.

Alternative C-—Recreation opportunities in developed sites would be emphasized and increased. Dispersed camping outside of developed sites would be eliminated. In Alternative C, the road and trail system providing recreation access would likely be reduced from the current transportation system.

The risk of decreases in habitat quality for relictual slender salamanders would be concentrated at the developed recreation sites. Overall effects to relictual slender salamanders would be lower than in the other alternatives because of the elimination of dispersed camping. Fewer acres of potential relictual slender salamander habitat would be impacted in Alternative C.

3. Special Management Areas: There are currently no special management areas for relictual slender salamanders in the Monument. RCAs and CARs are land allocations with activity-related standards and guidelines aimed at maintaining species viability.

Alternative A (No Action)—Within the CWHR range of relictual slender salamanders 33,227 acres would be within RCAs and 4,582 acres would be within CARs. Within these land allocations, the 2001 SNFPA guidelines would be followed to assess the impacts of management activities, require that Best Management Practices are followed to minimize adverse effects, and maintain habitat for riparian-dependent species.

Alternatives B, D, and F—Within the CWHR range of relictual slender salamanders 33,227 acres would be within RCAs and 4,582 acres would be within CARs. Within these land allocations, the 2004 SNFPA guidelines would be followed to assess the impacts of management activities, require that Best Management Practices are followed to minimize adverse effects, and maintain habitat for riparian-dependent species.

Alternative C—In Alternative C, RCOs would be the same as in the 2004 SNFPA, but the land allocations of RCAs and CARs would be abolished.

Alternative E—Management of riparian areas would follow the 1988 Forest Plan and the 1990 MSA. There would be no RCAs, CARs, or RCOs. Alternative E would have the least protection of relictual slender salamander habitat.

Cumulative Effects

The cumulative effects analysis area for relictual slender salamanders includes the western slope of the Sierra Nevada from the Tule River drainage in Tulare County south to the Greenhorn Mountains and Kern River Canyon in Kern County. This includes the Tule River Indian Reservation and a portion of Sequoia National Park. This is an appropriate scale for determining cumulative effects to relictual slender salamanders since it includes all suitable habitat potentially affected by implementation of an alternative in this FEIS. The cumulative effects time frame is the same as the other species analyzed in this document—20 years into the future. The cumulative effects of all past actions are incorporated into the existing condition.

Vegetation Management—Fuels reduction treatments that may impact relictual slender salamander habitat are currently occurring and would continue to occur throughout the analysis area. These treatments are generally focused near communities and other developed areas. Prescribed fire is a tool expected to be used throughout the area, with mechanical and hand thinning also occurring. The number of acres of relictual slender salamander habitat likely to be impacted in the analysis area is small, given the constraints on treatments (funding, air quality, etc.).

Grazing—Some portions of the mapped range of relictual slender salamanders in the southern portions of Sequoia National Forest are within grazing allotments. Grazing may result in trampling of individuals and reduce the quality of habitat by removing cover vegetation. These allotments are managed following Forest Service utilization standards designed to reduce adverse impacts. Grazing in Sequoia and Kings Canyon National Parks is limited to pack animals and is regulated to minimize adverse impacts.

Recreation Impacts—The Greenhorn Mountain area of Sequoia National Forest completed motorized travel route designation. As a result of this process, motorized cross-country travel will be prohibited and some routes in suitable relictual slender salamander habitat will be added to the National Forest Transportation System. Adverse impacts of motorized vehicles on relictual slender salamanders in this area will be reduced due to the elimination of cross-country travel in this portion of the forest (USDA 2009).

Wildfires—Large stand-replacing fires have the potential to reduce the quality of relictual slender salamander habitat by reducing canopy cover and removing down logs. However, in a study on the effects of fire on salamanders in the Sierra Nevada, Bagne and Purcell (2009) found that gregarious slender salamanders (*Batrachoseps gregarius*) persisted following low intensity fires.

Determination

All Alternatives—It is my determination that all of the alternatives ***may affect individuals***, but are not likely to result in a trend toward Federal listing or loss of viability of relictual slender salamander. Riparian areas are generally low priorities for fuels treatment projects and standards and guidelines for these areas would minimize adverse impacts. No more than 17 percent of potential habitat is within defense zones (the area most likely to receive vegetation treatments) in any of the alternatives. The potential for short-term loss of habitat features important to relictual slender salamanders would be the lowest in Alternatives C and D because of the smaller WUI defense zones. Alternative E would have the greatest risk for habitat loss for relictual slender salamanders because the riparian guidelines are less restrictive.

Foothill Yellow-legged Frog–Effects

Foothill Yellow-Legged Frog (*Rana boylii*)

Habitat Preferences and Biology

The foothill yellow-legged frog has been found primarily in shallow channels with riffles and at least cobble-sized substrates (Hayes and Jennings 1988). Streams and rivers used by this species have either permanent or intermittent flow, low or high gradient, and alluvial or bedrock channels. The species is also occasionally found in other habitats including moderately vegetated backwaters, isolated pools (Hayes and Jennings 1988), and slow-moving rivers having mud substrates (Fitch 1938).

The life-history strategy of the foothill yellow-legged frog has been shaped by the wet winters and dry summers typical of the Mediterranean climate in the Sierra Nevada. To protect its most vulnerable life stages (eggs and larvae), breeding is timed to take place late enough in spring to avoid extreme high flows. However breeding must occur early enough to allow tadpoles sufficient time to metamorphose, and juveniles time to grow, before the onset of the next wet season. Breeding sites are not continuously distributed along the streams and rivers occupied by this species, because the frogs select channels having particular morphological traits. Species breeding is noted at depositional areas, cobbles and boulders at tails/outlets of pools. Breeding occurs from late March through May, and egg deposition for any single population is concentrated into a two-week period (Storer 1925, Zweifel 1955). Breeding activity can be spread over several weeks in the Coast Ranges and up to 31 days in the Sierra Nevada (Van Wagner 1996). Duration of the breeding season appears to be determined by weather. In cold, rainy springs the breeding season is longer than in dry, warm springs.

Egg masses usually contain approximately 900 eggs, but the number of eggs can range from 100 to over 1,000 per mass (Storer 1925). Eggs must remain inundated and attached to substrates, despite falling or rising water levels. Sustained high-flows subsequent to egg mass deposition may dislodge masses or wash tadpoles downstream. Declining water levels may expose egg masses or leave tadpoles vulnerable to desiccation. In wide, shallow channels, stage and near bank velocity are less sensitive to changes in discharge than they are in deeper, more confined channels. Breeding sites that produce greater than average hatching success have significantly greater width-to-depth ratios, stable channels, low bed mobility and a coarse surface texture. Other key habitat elements identified are greater than 20 percent and less than 90 percent stream shading (Hayes and Jennings 1988), lack of riparian vegetation encroachment, and lack of introduced predators or competitors (Kupferberg 1997).

Historic and Current Distribution

Historically the foothill yellow-legged frog was common in most Pacific drainages from the Santiam River system in Oregon to the San Gabriel River system in Los Angeles County, California. Its historic elevation range in California extended from near sea level to approximately 6,000 feet. In the Sierra Nevada, the foothill yellow-legged frog has disappeared from at least 66 percent of its historic range (Lind et al. 2003).

There are numerous historical records for the Sequoia National Forest, including the Monument (Hayes et al. 2009). Sequoia National Forest has been conducting systematic surveys at historic sites and areas of suitable habitat forest-wide (Martin 1992, the Cal-Academy of Sciences 2001, Southern California Edison 2008, and Forest Service, various years). These efforts have resulted in only two confirmed detections in Sequoia National Forest. Both were in remote side tributaries to the North Fork Kern River in the Rincon Roadless area, outside the Monument. There are currently no known populations of foothill yellow-legged frogs within the Monument.

Risk factors

Water Development and Diversion is regarded as the most important risk factor affecting foothill yellow-legged frogs. Other risk factors include: introduced fish and other predators, pollution, grazing, climate change and disease.

Management

There is no specific management direction for this species. RCA buffers of 300 feet on either side of perennial streams, meadows, seeps, and springs and 150 feet on either side of intermittent streams provide some protection to habitat by limiting impacts from management projects. The foothill yellow-legged frog is listed as a California species of special concern by the California Department of Fish and Game.

Effects

Direct Effects

This is a programmatic level FEIS with no proposed ground disturbing activities and therefore, no direct effects.

Indirect Effects

1. Vegetation Management: Vegetation management projects for fuels reduction and ecological restoration may impact foothill yellow-legged frog habitat by reducing streamside cover and reducing water quality by increasing sedimentation.

All Alternatives—The immediate areas along lakes, ponds, and perennial streams that are potential habitat for foothill yellow-legged frogs are low priorities for vegetation management projects. By following Best Management Practices in these areas it is unlikely that there would be any measurable change in the quality of potential foothill yellow-legged frog habitat within the Monument.

2. Recreation Impacts: Recreation associated factors that may affect foothill yellow-legged frogs include habitat fragmentation, reduction in streamside cover, interference with dispersal, and mortality from vehicles hitting an animal.

Alternatives A, B, D, E, and F—The existing roads, trails and developed recreation sites would continue to be utilized in Alternatives A, B, D, E, and F.

Alternative C—Recreation opportunities in developed sites would be emphasized and increased. Dispersed camping outside of developed sites would be eliminated.

The risk of decreases in habitat quality for foothill yellow-legged frogs would be concentrated at the developed recreation sites. Overall effects to foothill yellow-legged frogs would be lower than in the other alternatives because of the elimination of dispersed camping. Fewer acres of potential foothill yellow-legged frog habitat would be impacted in Alternative C.

3. Special Management Areas: There are currently no special management areas for foothill yellow-legged frogs in the Monument. RCAs and CARs are land allocations with activity-related standards and guidelines aimed at maintaining species viability.

Alternative A (No Action)—Alternative A would maintain RCAs and CARs. All of the lakes, ponds, and perennial streams that could provide suitable habitat for foothill yellow-legged frogs would be within these land allocations. Within these areas, the 2001 SNFPA guidelines would be followed to assess the impacts of management activities, require that Best Management Practices are followed to minimize adverse effects, and maintain habitat for riparian-dependent species.

Alternatives B, D, and F—Alternatives B, D, and F would maintain RCAs and CARs. All of the lakes, ponds, and perennial streams that could provide suitable habitat for foothill yellow-legged frogs would be within these land allocations. Within these areas, the 2004 SNFPA guidelines would be followed to assess the impacts of management activities, require that Best Management Practices are followed to minimize adverse effects, and maintain habitat for riparian-dependent species.

Alternative C—In Alternative C, lakes, ponds, and streams would be managed following RCOs from the 2004 SNFPA. The land allocations of RCAs and CARs would be abolished.

Alternative E—Management of lakes, ponds, and streams would follow the 1988 Forest Plan and the 1990 MSA. There would be no RCAs, CARs, or RCOs. Alternative E would have the least protection of foothill yellow-legged frog habitat.

Cumulative Effects

The cumulative effects analysis area for the foothill yellow-legged frog includes the southern Sierra Nevada from the Kings River to the Breckenridge Mountains at the southern edge of Sequoia National Forest and east to the Kern Plateau. This includes the Tule River Indian Reservation and portions of Sequoia and Kings Canyon National Parks. This is an appropriate scale for determining cumulative effects to foothill yellow-legged frogs, since it includes all suitable habitat potentially affected by implementation of an alternative in this FEIS. The cumulative effects time frame is the same as the other species analyzed in this document—20 years into the future. The cumulative effects of all past actions are incorporated into the existing condition.

Vegetation Management—Fuels reduction treatments that may impact foothill yellow-legged frog habitat are currently occurring and would continue to occur throughout the analysis area. These treatments are generally focused near communities and other developed areas. Prescribed fire is a tool expected to be used throughout the area, with mechanical and hand thinning also occurring. The number of acres of foothill yellow-legged frog habitat likely to be impacted in the analysis area is small, given the constraints on treatments (funding, air

quality, etc.) and the low priority for treatments near lakes, ponds and streams.

Grazing—Grazing allotments in the southern portion of Sequoia National Forest include some historically occupied foothill yellow-legged frog habitat. Grazing may reduce streamside cover and reduce water quality. These allotments are managed following Forest Service utilization standards designed to minimize adverse impacts. Grazing in Sequoia and Kings Canyon National Parks is limited to pack animals and is regulated to minimize adverse impacts.

Recreation Impacts—The Greenhorn Mountain and Breckenridge areas of Sequoia National Forest completed motorized travel route designation. As a result of this process, motorized cross-country travel will be prohibited. Some routes in suitable foothill yellow-legged frog habitat will be added to the National Forest Transportation System. Adverse impacts of motorized vehicles on foothill yellow-legged frogs in this area will be reduced due to the elimination of cross-country travel in this portion of the Forest (USDA 2009).

Wildfires—Large stand-replacing fires have the potential to reduce the suitability of habitat for foothill yellow-legged frogs by removing streamside vegetation and degrading water quality.

Air pollution, disease and non-native species—Davidson (2004) found a strong association between upwind pesticide use in California and the decline of amphibians, including foothill yellow-legged frogs. Habitat throughout the analysis area may be adversely impacted by pesticides and other forms of air pollution.

Disease is strongly implicated in amphibian declines worldwide, with chytridiomycosis, a disease caused by chytrid fungus (*Batrachochytrium dendrobatidis*) responsible for mortality in many species. However, foothill yellow-legged frogs may be less susceptible to mortality from chytrid infection than other amphibian species (Davidson et al. 2007).

Predation by non-native fish, primarily trout, will continue to be a threat to foothill yellow-legged frogs in the analysis area.

Determination

Alternatives A, B, C, D, and F—It is my determination that Alternatives A, B, C, D, and F will have ***no effect*** on foothill yellow-legged frogs or their habitat. There are no known populations of foothill yellow-legged frogs with the Monument and lakes, ponds, and perennial streams are unlikely to be adversely effected by vegetation treatments by following the standards and guidelines for RCAs and CARs.

Alternative E—It is my determination that Alternative E ***may affect individuals***, but is not likely to result in a trend toward Federal listing or loss of viability of foothill yellow-legged frogs. Alternative E would have the greatest risk for loss of habitat quality for foothill yellow-legged frogs because the riparian guidelines are less restrictive.

Mountain Yellow-legged Frog–Effects

Mountain Yellow-Legged Frog (*Rana muscosa*)*

Habitat Preferences and Biology

Mountain yellow-legged frogs in the Sierra Nevada live in high mountain lakes, ponds, tarns, and streams—largely in areas that were glaciated as recently as 10,000 years ago (Zweifel 1955). This species is usually associated with montane riparian habitats in lodgepole pine, yellow pine, sugar pine, white fir, whitebark pine, and wet meadow vegetation types (Zweifel 1955, Ziener et al. 1988).

This species extensively uses deep water ponds (deeper than 8.2 feet) that have open shorelines and lack introduced fishes (Matthews and Pope 1999, Knapp and Matthews 2000, Knapp 2003). Adults are typically found sitting on rocks along the shoreline, usually where there is little or no vegetation (Wright and Wright 1933). Both larvae and adults prefer open shorelines with a gentle slope and shallow water two to three inches deep (Mullally and Cunningham

*Vredenburg et. al (2007) recommended that this taxon consists of two species, which they name *Rana muscosa*—Sierra Madre Yellow-legged Frog, and *Rana sierrae*—Sierra Nevada Yellow-legged Frog. The ranges of both these species would be in the Monument, with the Kings River the dividing line. For this analysis, the older taxon designation will be followed.

1956). Mountain yellow-legged frogs also use stream habitats, especially in the northern part of their range.

Mountain yellow-legged frogs may use different sites to overwinter, breed, and forage. Since larvae (tadpoles) must overwinter at least once before metamorphosis, it is important for breeding sites to have adequate water depth so that they do not dry in the summer and freeze through in the winter (Bradford 1983). It is also favorable for breeding sites to have some shallow areas with warm water temperatures for optimal larvae development and feeding (Bradford 1984). Larvae are a very sensitive life stage for this species. They are vulnerable to habitat changes, both desiccation and freezing, and high levels of predation. Subadults and adults may use several sites for feeding and then overwintering. Cover is important for movement between and within habitats.

Some of the highest observed densities of frogs have been found both at creek confluences having irregular banks and varying water depths, and in open areas on the edges of glaciated lakes (Mullally and Cunningham 1956). Mountain yellow-legged frog populations seem to be most numerous where predatory fish are absent.

In the Sierra Nevada, adult mountain yellow-legged frogs apparently hibernate during the coldest winter months, probably because they can tolerate only limited dehydration. Larvae and adults generally overwinter under ice. Both adults and larvae have been found to overwinter up to nine months in the bottoms of lakes at least 5.6 feet deep, and preferably at least 8.2 feet deep, or in rocky streams (Bradford 1983). In some instances, mountain yellow-legged frogs have been found to overwinter in bedrock crevices (Matthews and Pope 1999), which allow them to survive in shallow water bodies that freeze to the bottom in winter (Pope 1999). This behavior may be in response to the presence of introduced fishes that cannot survive in ponds that completely freeze.

Mountain yellow-legged frogs emerge from overwintering sites immediately following snow melt. Adults sometimes travel over snow to reach preferred breeding sites early in the season (Pope 1999). Breeding activity begins early in the spring and can range from April at lower elevations to June and July in higher elevations (Wright and Wright 1933, Stebbins 1951, Zweifel 1955). The timing of the onset of breeding depends on the amount of snowfall and subsequent thaw dates of ponds, lakes, and streams. In years with particularly cold winters, high elevation mountain yellow-legged frog populations may be active for as little as 90 days during the warmest part of summer (Bradford 1983).

Historic and Current Distribution

The mountain yellow-legged frog was once extremely abundant in aquatic ecosystems of the Sierra Nevada. It was distributed nearly continuously in high elevation water bodies in the Sierra Nevada, from southern Plumas County to southern Tulare County at elevations mostly above 6,000 feet. The historic range of the Sierra Nevada population of mountain yellow-legged frog encompasses 10 national forests (Lassen, Plumas, Tahoe, Lake Tahoe Basin Management Unit, El Dorado, Stanislaus, Humboldt-Toiyabe, Inyo, Sierra, and Sequoia) and three national parks (Yosemite, Sequoia, and Kings Canyon).

Since about 1970, mountain yellow-legged frog numbers and populations have undergone a precipitous decline throughout the Sierra Nevada. The most recent assessment of the species status in the Sierra Nevada indicates that mountain yellow-legged frogs occur at less than 10 percent of the sites from which they were historically observed.

Jennings and Hayes (1994) indicate that the mountain yellow-legged frog has been extirpated from a number of historical locations in the Sequoia National Forest. Sequoia National Forest has been conducting systematic mountain-yellow legged frog surveys at historic sites and areas of suitable habitat forest-wide. From 2003 to 2006, the USFS Sierra Nevada Adaptive Management Program (SNAMP) surveyed four watersheds on the Sequoia National Forest containing 24 sites. No mountain yellow-legged frogs were recorded during any of the surveys in these watersheds.

Currently, there are three known extant populations on the Forest, all located in the Golden Trout Wilderness, adjacent to the Monument. All of the recent mountain yellow-legged frog sightings have been of single frogs or very small populations.

Risk factors

Non-native trout, bullfrogs, airborne pollution, cattle grazing, ozone depletion, and chytrid fungus are all thought to be factors in the decline of this species.

Management and Status

There is no specific management direction for this species. RCA buffers of 300 feet on either side of perennial streams, meadows, seeps, and springs and 150 feet on either side of intermittent streams provide some protection to habitat by limiting impacts from management projects. The mountain yellow-legged frog is listed as a California species of special concern by the California Department of Fish and Game.

An assessment by the U.S. Fish and Wildlife Service released in 2003 found the Sierra Nevada distinct population of mountain yellow-legged frogs to be warranted for listing under the Endangered Species Act, but precluded by other higher priorities. They are currently a Candidate species.

Effects

Direct Effects

This is a programmatic level FEIS with no proposed ground disturbing activities and therefore, no direct effects.

Indirect Effects

1. Vegetation Management: Vegetation management projects for fuels reduction and ecological restoration may affect mountain yellow-legged frog habitat by reducing streamside cover and reducing water quality by increasing sedimentation.

All Alternatives—The immediate areas along lakes, ponds, and perennial streams that are potential habitat for mountain yellow-legged frogs are low priorities for vegetation management projects. By following Best Management Practices in these areas, it is unlikely that there would be any measurable change in the quality of potential mountain yellow-legged frog habitat within the Monument.

2. Recreation Impacts: Recreation associated factors that may affect mountain yellow-legged frogs include habitat fragmentation, reduction in streamside cover, interference with dispersal, and mortality from vehicles hitting an animal.

Alternatives A, B, D, E, and F—The existing roads, trails, and developed recreation sites would continue to be utilized in Alternatives A, B, D, E and F.

Alternative C—Recreation opportunities in developed sites would be emphasized and increased. Dispersed camping outside of developed sites would be eliminated.

The risk for a decrease in habitat quality for mountain yellow-legged frogs would be concentrated at the developed recreation sites. Overall effects to mountain yellow-legged frogs would be lower than in the other alternatives because of the elimination of dispersed camping, and the reduction of the road system. Fewer acres of potential mountain yellow-legged frog habitat would be affected in Alternative C.

3. Special Management Areas: There are currently no special management areas for mountain yellow-legged frogs in the Monument. RCAs and CARs are land allocations with activity-related standards and guidelines aimed at maintaining species viability.

Alternative A (No Action)—Alternative A would maintain RCAs and CARs. All of the lakes, ponds, and perennial streams that could provide suitable habitat for mountain yellow-legged frogs would be within these land allocations. Within these areas, the 2001 SNFPA guidelines would be followed to assess the effects of management activities, require that Best Management Practices are followed to minimize adverse effects, and maintain habitat for riparian-dependent species.

Alternatives B, D, and F—Alternatives B, D, and F would maintain RCAs and CARs. All of the lakes, ponds, and perennial streams that could provide suitable habitat for mountain yellow-legged frogs would be within these land allocations. Within these areas, the 2004 SNFPA guidelines would be followed to assess the effects of management activities, require that Best Management Practices are followed to minimize adverse effects, and maintain habitat for riparian-dependent species.

Alternative C—In Alternative C, lakes, ponds, and streams would be managed following RCOs from the 2004 SNFPA. The land allocations of RCAs and CARs would be abolished.

Alternative E—Management of lakes, ponds, and streams would follow the 1988 Forest Plan and the 1990 MSA. There would be no RCAs, CARs, or RCOs. Alternative E would have the least protection of mountain yellow-legged frog habitat.

Cumulative Effects

The cumulative effects analysis area for the mountain yellow-legged frog includes the southern Sierra Nevada from the Kings River to the Breckenridge Mountains at the southern edge of Sequoia National Forest and east to the Kern Plateau. This includes the Tule River Indian Reservation and portions of Sequoia and Kings Canyon National Parks. This is an appropriate scale for determining cumulative effects to mountain yellow-legged frogs, since it includes all suitable habitat potentially affected by implementation of an alternative of this FEIS. The cumulative effects time frame is the same as the other species analyzed in this document—20 years into the future. The cumulative effects of all past actions are incorporated into the existing condition.

Vegetation Management—Fuels reduction treatments that may impact mountain yellow-legged frog habitat are currently occurring and would continue to occur throughout the analysis area. These treatments are generally focused near communities and other developed areas. Prescribed fire is a tool expected to be used throughout the area, with mechanical and hand thinning also occurring. The number of acres of mountain yellow-legged frog habitat likely to be impacted in the analysis area is small, given the constraints on treatments (funding, air quality, etc.) and the low priority for treatments near lakes, ponds, and streams.

Grazing—Grazing allotments in the southern portion of Sequoia National Forest include some historically occupied mountain yellow-legged frog habitat. Grazing may reduce streamside cover and reduce water quality. These allotments are managed following Forest Service utilization standards designed to minimize adverse impacts. Grazing in Sequoia and Kings Canyon National Parks is limited to pack animals and is regulated to minimize adverse impacts.

Recreation Impacts—The Greenhorn Mountain and Breckenridge areas of Sequoia National Forest completed motorized travel route designation. As a result of this process, motorized cross-country travel will be prohibited. Some routes in suitable mountain yellow-legged frog habitat will be added to the National Forest Transportation System. Adverse impacts of motorized vehicles on mountain yellow-legged frogs in this area will be reduced due to the elimination of cross-country travel in this portion of the Forest (USDA 2009).

Wildfires—Large stand-replacing fires have the potential to reduce the suitability of habitat for mountain yellow-legged frogs by removing streamside vegetation and degrading water quality through increased sedimentation.

Air pollution, disease and non-native species—Davidson (2004) found a strong association between upwind pesticide use in California and the decline of amphibians, including mountain yellow-legged frogs. Habitat throughout the analysis area may be adversely impacted by pesticides and other forms of air pollution.

Disease is strongly implicated in amphibian declines worldwide, with chytridiomycosis, a disease caused by chytrid fungus (*Batrachochytrium dendrobatidis*) responsible for mortality in many species. Chytrid infection is known to occur in the analysis area and has been documented to cause mortality of mountain yellow-legged frogs (Fellers et al. 2007).

Predation by non-native fish, primarily trout, will continue to be a threat to mountain yellow-legged frogs in the analysis area. Removal of trout from some high elevation lakes in Kings Canyon National Park has led to the recovery of mountain yellow-legged frog populations in those areas (Knapp et al. 2007).

Determination

Alternatives A, B, C, D, and F—It is my determination that Alternatives A, B, C, D, and F will have ***no effect*** on mountain yellow-legged frogs or their habitat. There are no known populations of mountain yellow-legged frogs within the Monument. The high elevation lakes within the Monument are in wilderness areas. Lakes, ponds, and perennial streams are unlikely to be adversely effected by vegetation treatments by following the standards and guidelines for RCAs and CARs.

Alternative E—It is my determination that Alternative E ***may affect individuals***, but is not likely to accelerate the trend toward Federal listing or result in loss of viability for the mountain yellow-legged frogs. Alternative E would have the greatest risk for a loss of habitat quality for mountain yellow-legged frogs because the riparian guidelines are less restrictive. However, the risk of adverse effects is slight because the high elevation lakes within the Monument are in wilderness.

Southwestern Pond Turtle–Effects

Southwestern Pond Turtle (*Actinemys marmorata pallida*)*

Habitat Preferences and Biology

Southwestern pond turtles historically occurred in a wide variety of permanent and intermittent aquatic habitats, generally slow-moving waters below 5,000 feet elevation. Populations have been found in rivers, streams, lakes, ponds and other seasonal and permanent wetlands. In intermittent streams, southwestern pond turtles can use permanent pools that persist after the main stream course dries (Holland 1991). Southwestern pond turtles require basking sites such as partially submerged logs, rocks, mud banks or emergent vegetation. The presence of suitable refugia, such as spaces under rocks, downed logs, holes in banks and undercut banks may be a critical factor in the ability of populations to maintain themselves in small streams. Southwestern pond turtles eat aquatic plants, invertebrates, worms, frog and salamander eggs and larvae, crayfish, carrion, and occasionally frogs and fish. Hatchlings eat aquatic zooplankton.

Nests are generally found in open areas dominated by grasses or herbaceous annuals, primarily on south or southwest aspects under 25 percent slope and with friable soils. A good supply of litter and duff is important for nest site selection (Holland 1994). Nest distance from water varies considerably. The known range is 55-1300 feet but most are within 650 feet of water (Ibid).

Historic and Current Distribution

Historically found from San Francisco Bay south into northern Baja California, from sea level to over 5,900 feet (1,800 meters) in elevation. The southwestern pond turtle has disappeared from 30 to 40 percent of its historic range in California (Holland 1991).

Turtle specific surveys have not been conducted on the Sequoia National Forest. Southwestern pond turtle observations have been made during aquatic surveys or other forest activity surveys and specific surveys for aquatic amphibians and reptiles by Cal Academy under Forest Service agreements. Southwestern pond turtles have been observed at numerous locations within the Monument. Several low elevation, low gradient stretches of water in the Monument may have southwestern pond turtles.

Risk factors

Reasons for the decline of southwestern pond turtles include the introduction of predators such as bullfrogs and bass, population fragmentation due to loss and alteration of riparian habitats, and historic commercial harvests (Holland 1994).

Management and Status

The northern portion of the Monument contains a CAR for southwestern pond turtles, protecting 22,565 acres of habitat (Map 23). RCA buffers provide some protection from management activities to southwestern pond turtle habitat throughout the Monument. California Department of Fish and Game lists southwestern pond turtle as a California species of special concern.

Effects

Direct Effects

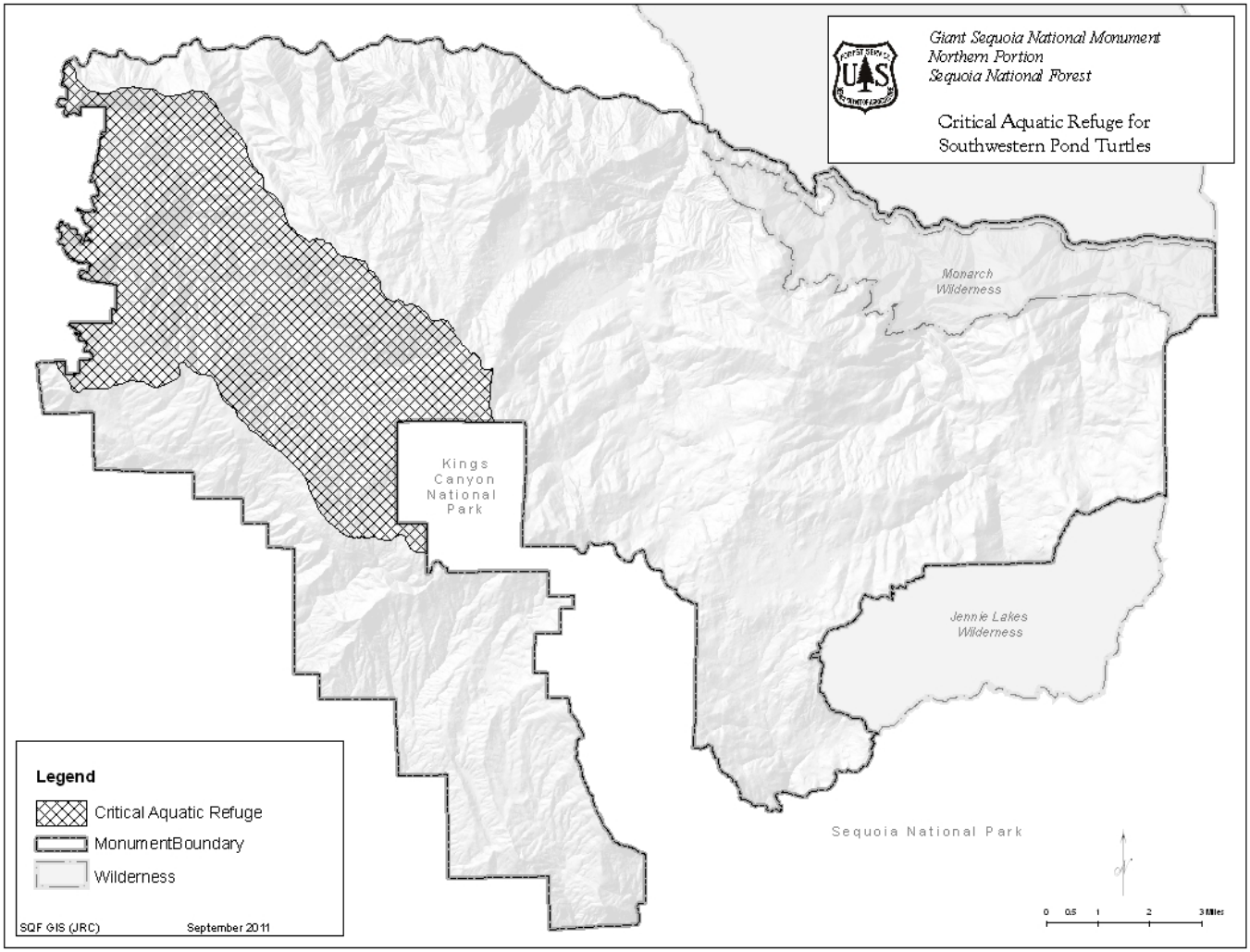
This is a programmatic level FEIS with no proposed ground disturbing activities and, therefore, no direct effects.

Indirect Effects

1. Vegetation Management: Vegetation management projects for fuels reduction and ecological restoration may affect southwestern pond turtle habitat by disturbing nesting sites, reducing

*Formerly this subspecies was called *Clemmys marmorata pallida* and *Emys marmorata pallida*. Some recent publications do not recognize subspecies of *A. marmorata* and use the common name Pacific pond turtle, but in this document the traditionally recognized subspecies designation will be used.

Map 23



streamside cover, and reducing water quality by increasing sedimentation.

All Alternatives—The immediate areas along lakes, ponds, and perennial streams that are potential habitat for southwestern pond turtles are low priorities for vegetation management projects. By following Best Management Practices in these areas it is unlikely that there would be any measurable change in the quality of potential southwestern pond turtle habitat within the Monument.

2. Recreation Impacts: Recreation associated factors that may affect southwestern pond turtles include habitat fragmentation, reduction in streamside cover, interference with dispersal, and mortality from vehicles hitting an animal.

Alternatives A, B, D, E, and F—The existing roads, trails and developed recreation sites would continue to be utilized in Alternatives A, B, D, E, and F.

Alternative C—Recreation opportunities in developed sites would be emphasized and increased. Dispersed camping outside of developed sites would be eliminated.

The risk of decreases in habitat quality for southwestern pond turtles would be concentrated at the developed recreation sites. Overall effects to southwestern pond turtles would be lower than in the other alternatives because of the elimination of dispersed camping. Fewer acres of potential southwestern pond turtle habitat would be impacted in Alternative C.

3. Special Management Areas: There is a CAR for southwestern pond turtles, protecting 22,565 acres of habitat in the Mill Creek watershed in the northern portion of the Monument. CARs and RCAs are land allocations with activity-related standards and guidelines aimed at maintaining species viability.

Alternative A (No Action)—Alternative A would maintain RCAs and CARs. All of the lakes, ponds, and perennial streams that could provide suitable habitat for southwestern pond turtles would be within these land allocations. Within these areas, the 2001 SNFPA guidelines would be followed to assess the impacts of management activities, require that Best Management Practices are followed to minimize adverse effects, and maintain habitat for riparian-dependent species.

Alternatives B, D, and F—Alternatives B, D, and F would maintain RCAs and CARs. All of the lakes, ponds, and perennial streams that could provide suitable habitat for southwestern pond turtles would be within these land allocations. Within these areas, the 2004 SNFPA guidelines would be followed to assess the impacts of management activities and require that Best Management Practices are followed to minimize adverse effects, and maintain habitat for riparian-dependent species.

Alternative C—In Alternative C, lakes, ponds, and streams would be managed following RCOs from the 2004 SNFPA. The land allocations of RCAs and CARs would be abolished.

Alternative E—Management of lakes, ponds, and streams would follow the 1988 Forest Plan and the 1990 MSA. There would be no RCAs, CARs, or RCOs. Alternative E would have the least protection of southwestern pond turtle habitat.

Cumulative Effects

The cumulative effects analysis area for the southwestern pond turtle includes the southern Sierra Nevada from the Kings River to the Breckenridge Mountains at the southern edge of Sequoia National Forest and east to the Kern Plateau. This includes the Tule River Indian Reservation and portions of Sequoia and Kings Canyon National Parks. This is an appropriate scale for determining cumulative effects to southwestern pond turtles, since it includes all suitable habitat potentially affected by implementation of an alternative in this FEIS. The cumulative effects time frame is the same as the other species analyzed in this document—20 years into the future. The cumulative effects of all past actions are incorporated into the existing condition.

Vegetation Management—Fuels reduction treatments that may impact southwestern pond turtle habitat are currently occurring and would continue to occur throughout the analysis area. These treatments are generally focused near communities and other developed areas. Prescribed fire is a tool expected to be used throughout the area, with mechanical and hand thinning also occurring. The number of acres of southwestern pond turtle habitat likely to be impacted in the analysis area is small, given the constraints on treatments (funding, air quality, etc.) and the low priority for treatments near lakes, ponds, and streams.

Grazing—Grazing allotments in the southern portion of Sequoia National Forest include some southwestern pond turtle habitat. Grazing may reduce streamside cover and reduce water quality. These allotments are managed following Forest Service utilization standards designed to minimize adverse impacts. Grazing in Sequoia and Kings Canyon National Parks is limited to pack animals and is regulated to minimize adverse impacts.

Recreation Impacts—The Greenhorn Mountain and Breckenridge areas of Sequoia National Forest completed motorized travel route designation. As a result of this process, motorized cross-country travel will be prohibited. Some routes in suitable southwestern pond turtle habitat will be added to the National Forest Transportation System. Adverse impacts of motorized vehicles on southwestern pond turtles in this area will be reduced due to the elimination of cross-country travel in this portion of the Forest (USDA 2009).

Overall recreation visits within the analysis area are expected to increase. More recreation use may increase the probability of disturbance to southwestern pond turtles and mortality from vehicle collisions.

Wildfires—Large stand-replacing fires have the potential to reduce the suitability of habitat for southwestern pond turtles by removing streamside

vegetation and degrading water quality through sedimentation. A reduction in water quality could reduce the abundance of prey.

Determination

All Alternatives—It is my determination that all of the alternatives ***may affect individuals***, but are not likely to result in a trend toward Federal listing or loss of viability of southwestern pond turtles. Areas along lakes, ponds, and perennial streams that are potential habitat for southwestern pond turtles are low priorities for vegetation management projects. However, potential nesting areas away from water could be affected by fuels reduction or ecological restoration projects. Alternative E would have the greatest risk for loss of habitat quality for southwestern pond turtles because the riparian guidelines are less restrictive.

California Legless Lizard–Effects

California Legless Lizard (*Annelia pulchra*)

Habitat Preferences and Biology

California legless lizards are associated with sandy or loose, loamy soils in stabilized dunes and coastal scrub, sparse pine-oak woodlands, and mixed hardwood riparian areas. The species is frequently found under cover objects, such as logs and rocks (Jennings and Hayes 1994). Soil moisture is necessary for thermal regulation, and animals may die if they are unable to reach a moist substrate. Soil moisture may limit California legless lizards at the extents of their range (Bury and Balgooyen 1976). California legless lizards feed mainly on larval insects, beetles, termites, and spiders.

California legless lizards show a preference for low temperatures, and are usually encountered at temperatures of 8° to 28° C in the field. California legless lizards may be nocturnal during the summer. In coastal areas, California legless lizards are probably active year-round, while at inland locations they may hibernate in the winter (Jennings and Hayes 1994).

Historic and Current Distribution

California legless lizards are found from the southern edge of the San Joaquin River in northern Contra Costa County south to Baja California. The species is believed extirpated from approximately 20 percent of its known historical range. It occurs in scattered locations in the San Joaquin Valley, and along the southern Sierra Nevada mountains.

The California Natural Diversity Database lists a small number of occurrences for this species in the Sierra Nevada. About one-third of the Monument is within the CWHR mapped range of California legless lizards (Maps 24 and 25). This species has been found in the Sequoia National Forest north of Kernville near Bull Run Creek and in the Springville area adjacent to National Forest System land. It is presumed to be present within the Monument.

Risk factors

Threats to California legless lizards include urbanization, agricultural development, and the spread of exotic plant species (Goldberg and Miller 1985, Jennings and Hayes 1994).

Management

There is no specific management direction for this species. The California legless lizard is listed as a California species of special concern by the California Department of Fish and Game.

Effects

Direct Effects

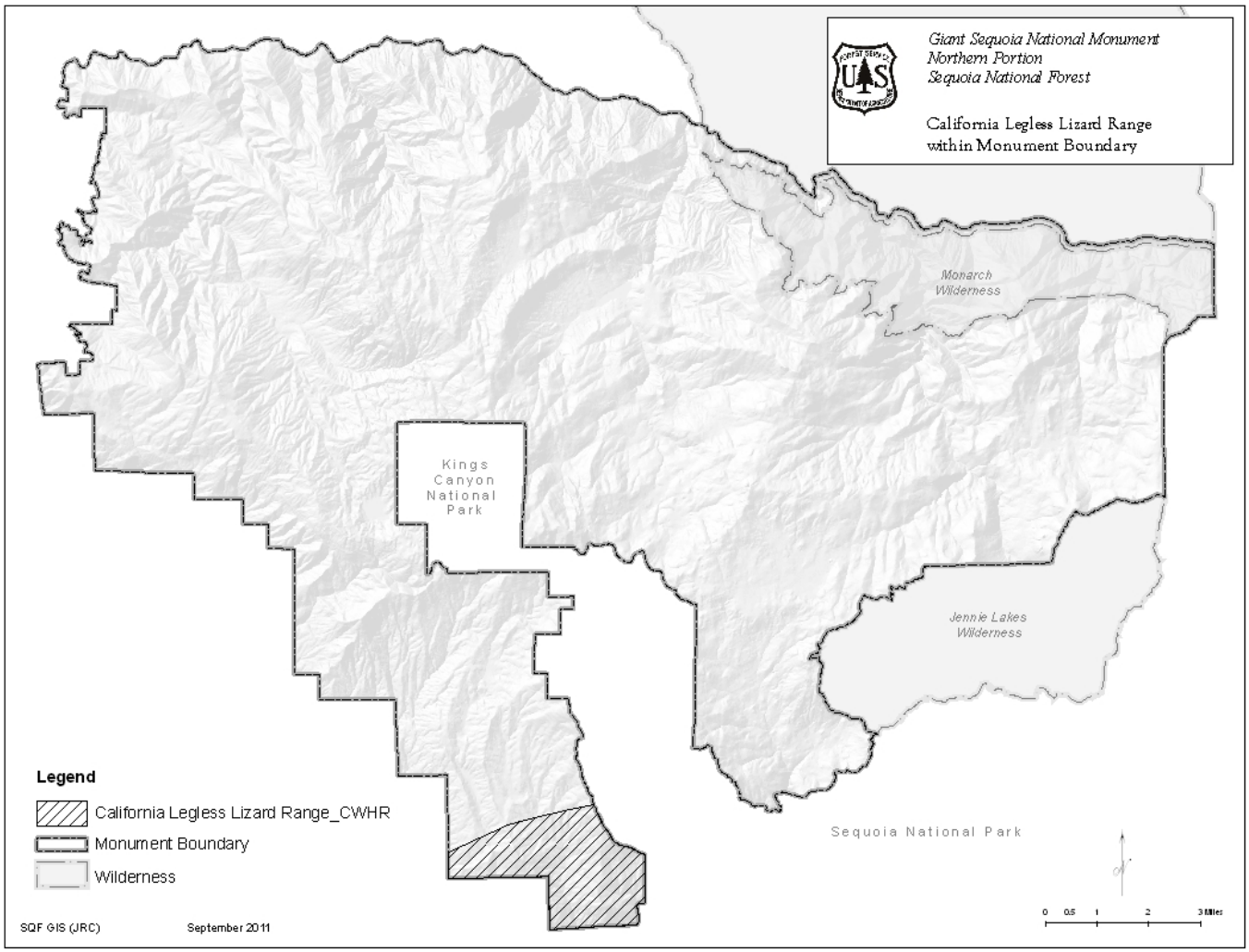
This is a programmatic level FEIS with no proposed ground disturbing activities and therefore, no direct effects.

Indirect Effects

1. Vegetation Management: Vegetation management projects for fuels reduction and ecological restoration may affect California legless lizard habitat by fragmenting habitat and removing down woody debris. All of the alternatives would follow management direction to set the highest priority for fuels reduction activities in the WUI.

Alternative A (No Action)—Alternative A would continue the existing direction in the 2001 SNFPA to locate fuels treatments across broad landscapes, so that the spread and intensity of wildfire is reduced. Within the CWHR range of California legless lizard in the Monument there are currently 29,102 acres of defense zone (24 percent of the range) and 52,686

Map 24



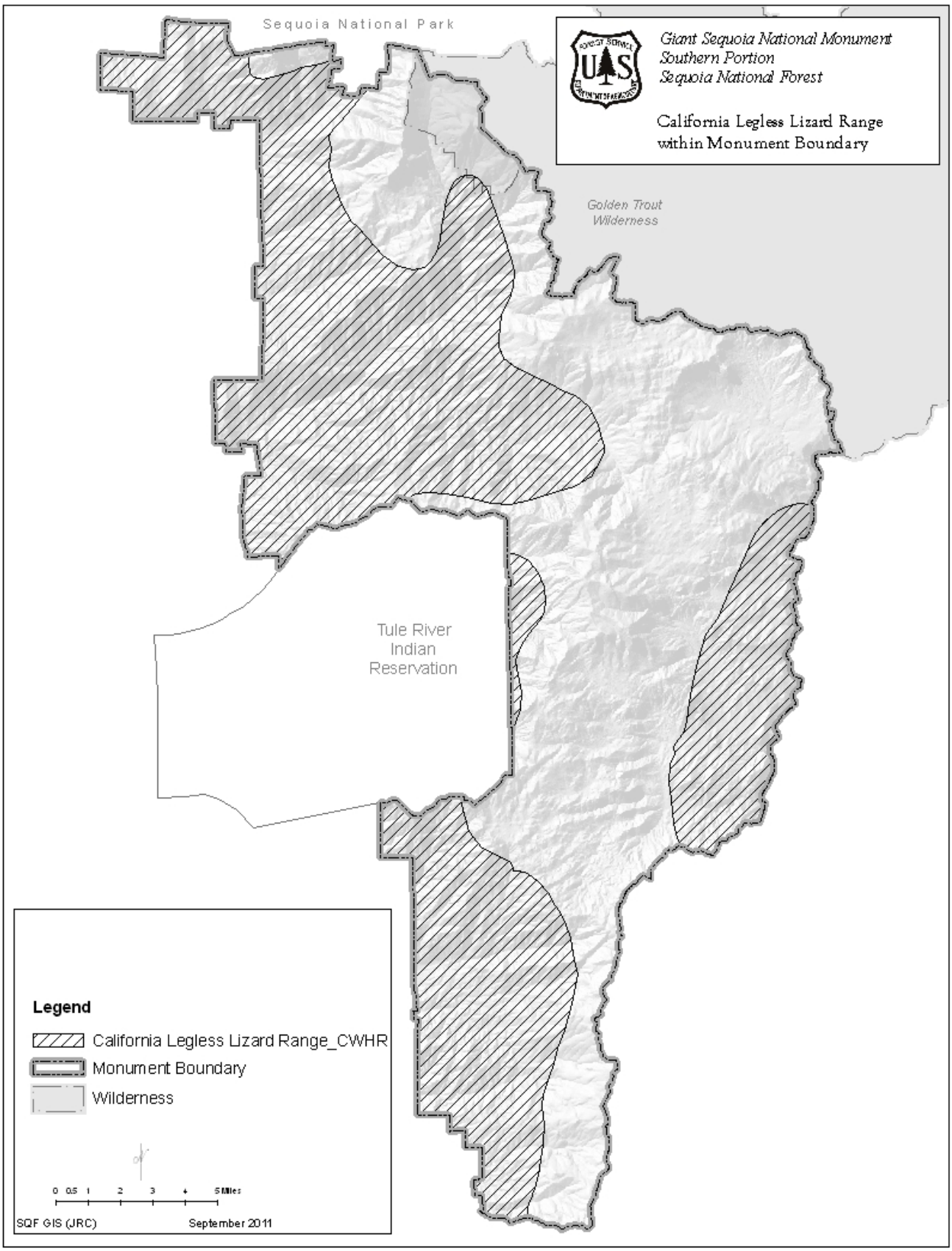
acres of threat zone (44 percent of range). These areas have the highest priority for fuels treatments which might remove habitat features important to California legless lizard.

Alternative B—WUIs would be the same as in Alternative A. In addition, a TFETA would include 29,276 acres in the CWHR range of California legless lizards. The short-term loss of habitat features important to California legless lizard would likely be higher in Alternative B than in Alternatives A, C, D, and E.

Alternative C—Alternative C would designate a WUI defense zone that extends approximately 300 feet from structures, developed recreation sites, and administrative sites. Approximately four percent of the CWHR range of California legless lizards in the Monument (4,327 acres) would be included in defense zones. Assuming that fuels treatments would be concentrated in the WUIs, the short-term loss of habitat features important to California legless lizards would be lower in Alternative C than in Alternatives A, B, E, and F.

Alternative D—In Alternative D, designated WUI defense zone would cover approximately two percent of the CWHR range of California legless lizards in the Monument (2,682 acres). The number of acres expected to be treated in Alternative D is small compared to those that would be treated in the other alternatives. Therefore, the potential for short-term loss of habitat features important to California legless lizards would be the lowest in Alternative D.

Map 25


Sequoia National Park
Giant Sequoia National Monument
Southern Portion
Sequoia National Forest
California Legless Lizard Range
within Monument Boundary
Golden Trout
Wilderness
Tule River
Indian
Reservation
Legend
California Legless Lizard Range_CWHR
Monument Boundary
Wilderness
0 0.5 1 2 3 4 5 Miles
SQF GIS (JRC)
September 2011

Alternative E—The designated WUIs and fuels treatment strategy would be the same as in Alternative A. Therefore, the effects on California legless lizard habitat are expected to be the same.

Alternative F—Alternative F would continue existing management direction to make fuels reduction activities in the current WUIs the highest priority. The size of the WUI defense and threat zones would be the same as in Alternatives A, B, and E. In addition the TFETA would be established. Alternative F would eliminate the standard and guideline from the 2001 SNFPA requiring retention of all conifer trees with a dbh of 30 inches or greater and hardwoods with a dbh of 12 inches or larger when implementing vegetation treatments. There would be a six-inch diameter limit within one to two acres of a nest tree for the northern goshawk and California spotted owl. There would be no diameter limit for the rest of the acreage in the PACs. The potential for short-term loss of habitat features important to California legless lizards (e.g. habitat connectivity) would likely be higher in Alternative F than in the other alternatives due to the lack of diameter limits on tree felling. The long-term resiliency of California legless lizard habitat to stand-replacing events such as fire, insects, and disease may be improved following treatments for ecological restoration.

2. Recreation Impacts: Recreation associated factors that may affect California legless lizards include habitat fragmentation, reduction in density of down logs due to their removal near roads or recreation sites, and mortality from vehicles hitting an animal.

Alternatives A, B, D, E, and F—The existing roads, trails and developed recreation sites would continue to be utilized in Alternatives A, B, D, E, and F. The effects to California legless lizards could include the loss of down logs if they are removed for fuel wood.

Alternative C—Recreation opportunities in developed sites would be emphasized and increased. Dispersed camping outside of developed sites would be eliminated. Camping in more remote locations, in designated roadless areas, or in the Wildlands recreation niche setting would be allowed by permit.

The risk of mortality from vehicles and loss of down woody material would be concentrated at the developed recreation sites. Overall effects to California legless lizards would be lower than in the other alternatives because of the elimination of dispersed camping and the restriction on vehicle types. Fewer acres of potential California legless lizard habitat would be impacted in Alternative C.

3. Special Management Areas: There are no special management areas for California legless lizards. Down woody debris standards and RCAs may provide some benefit.

Cumulative Effects

The cumulative effects analysis area for California legless lizards includes the southern Sierra Nevada from the northern Tulare County to the Southern edge of Sequoia National Forest. This includes the Tule River Indian Reservation and portions of Sequoia National Park. This is an appropriate scale for determining cumulative effects to California legless lizard, since it includes a diverse array of habitat types important to California legless lizards and encompasses the entire range of this species in the Sierra Nevada. The cumulative effects time frame is the same as the other species analyzed in this document—20 years into the future. The cumulative effects of all past actions are incorporated into the existing condition.

Vegetation Management—Fuels reduction treatments that may impact California legless lizard habitat are currently occurring and would continue to occur throughout the analysis area. These treatments are generally focused near communities and other developed areas. Prescribed fire is a tool expected to be used throughout the area, with mechanical and hand thinning also occurring. The number of acres of California legless lizard habitat likely to be impacted in the analysis area is small, given the constraints on treatments (funding, air quality, etc.).

Recreation Impacts—The Greenhorn Mountain and Breckenridge areas of Sequoia National Forest completed motorized travel route designation. As a result of this process, motorized cross-country travel will be prohibited. Some routes in suitable California legless lizard habitat will be added to the National Forest Transportation System. Adverse impacts of motorized vehicles on California legless lizards in this area will be reduced due to the elimination of cross-country travel in this portion of the Forest (USDA 2009).

Overall recreation visits within the analysis area are expected to increase. More recreation use may increase the probability of disturbance to California legless lizards and mortality from vehicle collisions.

Wildfires—Large stand-replacing fires have the potential to reduce the suitability of habitat for California legless lizards by fragmenting habitat, removing down woody debris, and reducing prey availability.

Determination

All Alternatives—It is my determination that all of the alternatives ***may affect individuals***, but are not likely to result in a trend toward Federal listing or loss of viability of California legless lizards. All of the alternatives would allow short-term reductions in habitat quality by removing down woody material, but in the long term, reduction in the chance of large stand-replacing fire and increases in forest resiliency would benefit California legless lizards and their prey species.

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Appendix B—Wildlife Standards and Guidelines

Wildlife Standards and Guidelines for Monument Plan Action Alternatives

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Wildlife: Old Forest Associated Species				
Minimize old forest habitat fragmentation. Assess potential impacts of fragmentation on old forest associated species (particularly by fisher and marten) in biological evaluations. Evaluate locations of new landings, staging areas, and recreational developments, including trails and other disturbances. (2001 SNFPA ROD, Appendix A, pg. A-27)	Same as Alt. B	Same as Alt. B	Provide habitat for wildlife species associated with late-successional and old-growth forest stands retaining five percent of old-growth outside of riparian area habitats, well dispersed over the forest. (LRMP pg. 4-28)	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Assess the potential impact of projects on the connectivity of habitat for old forest associated species. (2001 SNFPA ROD, Appendix A, pg. A-27)	Same as Alt. B	Same as Alt. B	Not addressed in MSA	Same as Alt. B
Consider forest linkages (with canopy cover greater than 40 percent) that are interconnected via riparian areas and ridge top saddles during landscape-level and project-level analysis. (2001 SNFPA ROD, Appendix A, pg. A-27)	Same as Alt. B	Same as Alt. B	Not addressed in MSA	Same as Alt. B
During landscape analysis, identify areas for acquisition, exchange, or conservation easements to enhance connectivity of habitat for old forest associated species. Assign a priority order for these areas. (2001 SNFPA ROD, Appendix A, pg. A-28)	Same as Alt. B	Same as Alt. B	Not addressed in MSA	Same as Alt B.
Wildlife: Large Tree Retention				
When implementing vegetation and fuels treatments, retain all live conifer trees with a dbh of 30 inches or greater in westside forest types. Retain montane hardwoods with a dbh of 12 inches or larger in westside forest types. Occasional mortality of larger trees is expected to occur; however, design prescribed burn prescriptions and techniques to minimize the loss of large trees and large down material. (2001 SNFPA ROD, Appendix A, pg. A-28)	Same as Alt. B	Same as Alt. B	Not addressed in MSA	N/A
Wildlife: Snags				
Remove snags as needed to address imminent safety hazards.	Same as Alt. B	Same as Alt. B	Same as Alt. B	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Manage snag levels for ecological restoration. Within green forests, design projects to provide a sustainable population of medium-and large-diameter snags, as well as medium- and large-diameter living trees that exhibit form and/ or decay characteristics regarded as important wildlife habitat (e.g., have substantial wood defect, teakettle branches, broken tops, large cavities in the bole, etc.), will form the backbone snag network over large landscapes.	Same as Alt. B	Same as Alt. B	Maintain a minimum average of 1.5 snags per acre in each compartment. Provide habitat for wildlife species dependent on down logs and snags in timber harvested areas. (LRMP pg. 4-29)	Same as Alt. B
In areas burned by wildfire, including high- and mid-severity patches, manage snag levels to meet ecological restoration or human safety objectives. However, design the spatial arrangement and density of snags to meet unique post-wildfire management needs. Include site-specific considerations such as a wider range of snag sizes and densities, and focal placement of snags and snag patches.	Same as Alt. B	Same as Alt. B	Maintain a minimum average of 1.5 snags per acre in each compartment. (MSA pg. 89)	Same as Alt. B
Wildlife: Incidental Removal of Vegetation and Down Woody Material				
Retain felled trees on the ground where needed to achieve down woody material standards of 10 to 20 tons per acre in logs greater than 12 inches in diameter. (2001 SNFPA ROD, Appendix A, pg. A-26) Incidental removal of vegetation and down woody material for activities such as administering special use permits; maintaining recreation developments; constructing, reconstructing, and maintaining roads, trails,	Same as Alt. B	Same as Alt. B	Retain approximately 132 cubic feet per acre of well-dispersed down logs. Ideal log size is 20 inches in diameter and 20 feet in length. (LRMP pg. 4-29)	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
and rights of way; expanding resorts based on approved development plans; and removing trees that present imminent safety hazards may deviate from vegetation standards and guidelines. Exceptions to vegetation management standards and guidelines may also include restoration activities, such as regenerating aspen, managing sugar pine, and regenerating giant sequoia. (2001 SNFPA ROD, Appendix A, pg. A-29)				
Fall and remove hazard trees along maintenance level 3, 4, and 5 roads and within or immediately adjacent (tree falling distance) to administrative sites. Review by an appropriate resource specialist is required prior to falling hazard trees along maintenance level 1 and 2 roads. Retain felled trees where needed to meet down woody material standards. (2001 SNFPA ROD, Appendix A, pg. A-29)	Same as Alt. B	No tree cutting allowed except for public/firefighter safety.	Not addressed in MSA	Same as Alt. B
California Spotted Owl PACs				
The spotted owl habitat areas (SOHAs) established in the original forest plans would no longer be a land allocation. (FEIS Vol. 1, Ch. 2, pg. 38) Delineate California spotted owl protected activity centers (PACs) surrounding each territorial owl activity center detected on National Forest System lands since 1986. Owl activity centers are designated for all territorial owls based on: (1) the most recent documented nest site, (2) the most recent known roost site when a nest	The spotted owl habitat areas (SOHAs) established in the original forest plans would no longer be a land allocation. (FEIS Vol. 1, Ch. 2, pg. 38) Spotted owl PACs are not a land allocation in this alternative.	Same as Alt. B	Maintain a network of 40 spotted owl habitat areas (SOHAs). Manage 1,000 acres of suitable habitat plus approximately 650 acres of replacement habitat for each network site using a “No Scheduled Timber Harvest” prescription. Manage according to the Regional Spotted Owl Guidelines,	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
location remain unknown, and (3) a central point based on repeated daytime detections when neither nest or roost locations are known. (2001 SNFPA ROD, Appendix A, pg. A-33)			Appendix H. (LRMP pg. 4-29)	
Delineate PACs to: (1) include known and suspected nest stands and (2) encompass the best available 300 acres of habitat in as compact a unit as possible. Select the best available habitat for PACs to incorporate: (1) two or more tree canopy layers; (2) trees in the dominant and co-dominant crown classes averaging 24 inches dbh or greater; (3) at least 70 percent tree canopy cover (including hardwoods); (4) in descending order or priority, CWHR classes 6, 5D, 5M, 4D, and 4M and other stands with at least 50 percent canopy cover (including hardwoods). Use aerial photography interpretation and field verification as needed to delineate PACs. (2001 SNFPA ROD, Appendix A, Pg. A-33)	Spotted owl PACs are not a land allocation in this alternative.	Same as Alt. B	MSA requires management using existing SOHAs.	Same as Alt. B
As additional nest location and habitat data become available, review boundaries of PACs and make adjustments as necessary to better include known and suspected nest stands and to encompass the best available 300 acres of habitat. (2001 SNFPA ROD, Appendix A, pg. A-33)	Spotted owl PACs are not a land allocation in this alternative.	Same as Alt. B	Not addressed in MSA	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
When activities are planned adjacent to non-national forest lands, check available databases for the presence of nearby California spotted owl activity centers on non-national forest lands. Delineate a 300- acre circular area centered on the activity center. Designate and manage any part of the circular 300-acre area that lies on national forest lands as a California spotted owl PAC. (2001 SNFPA ROD, Appendix A, pg. A-34)	Spotted owl PACs are not a land allocation in this alternative.	Same as Alt. B	Not addressed in MSA	Same as Alt. B
Prior to undertaking vegetation treatments in suitable California spotted owl habitat with unknown occupancy, conduct surveys in accordance with Pacific Southwest Region survey protocol. Designate California spotted owl protected activity centers (PACs) where appropriate based on survey results. (2001 SNFPA ROD, Appendix A, pg. A-34)	Prior to undertaking vegetation treatments in suitable California spotted owl habitat with unknown occupancy, conduct surveys in accordance with Pacific Southwest Region survey protocol. Modify project if necessary based on survey results. (Modified from SNFPA ROD, Appendix A, pg. A-34)	Same as Alt. B	Required evaluation of impacts for projects within 1.5 miles from the center of a SOHA, surveys and evaluation in a BE for timber sales. (MSA pgs. 52-55)	Same as Alt. B
When activities are planned within or adjacent to a PAC and the location of the nest site or activity center is uncertain, conduct surveys to establish or confirm the location of the nest or activity center. (2001 SNFPA ROD, Appendix A, pg. A-34)	Spotted owl PACs are not a land allocation in this alternative.	Same as Alt. B	Not addressed in MSA	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Maintain PACs regardless of California spotted owl occupancy status, unless habitat is rendered unsuitable by a catastrophic stand-replacing event and surveys conducted to protocol confirm non-occupancy. (2001 SNFPA ROD, Appendix A, pg. A-34)	Spotted owl PACs are not a land allocation in this alternative.	Same as Alt. B	Not addressed in MSA	Same as Alt. B
California Spotted Owl PACs: Limited Operating Period				
Maintain a limited operating period (LOP), prohibiting activities within approximately ¼ mile of the nest site during the breeding season (March 1 through August 15) unless surveys confirm that California spotted owls are not nesting. The LOP does not apply to existing road and trail use and maintenance or continuing recreation use, except where analysis of proposed projects or activities determines that either existing or proposed activities are likely to result in nest disturbance. (2001 SNFPA ROD, Appendix A, pg. A-34)	Limited operating periods appropriate for the particular location would be used as needed. (New S&G appropriate for NPS management)	Same as Alt. B	Not addressed in MSA	Same as Alt. B
The LOP may be waived for individual projects or activities of limited scope and duration or when a biological evaluation documents that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing, and specific location. Where a biological evaluation determines that a nest site will be shielded from planned activities by topographic features that minimize disturbance, the LOP buffer distance may be reduced. (2001 SNFPA ROD, Appendix A, pg. A-34)	Limited operating periods appropriate for the particular location would be used as needed. (New S&G appropriate for NPS management)	Same as Alt. B	Not addressed in MSA	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
The LOP may be waived where necessary to allow for early season prescribed burning in up to five percent of the California spotted owl PACs on a national forest per year. (2001 SNFPA ROD, Appendix A, pg. A-34)	Limited operating periods appropriate for the particular location would be used as needed. (New S&G appropriate for NPS management.	Same as Alt. B	Not addressed in MSA	Same as Alt. B
California Spotted Owl PACs: Fuel Treatments				
In PACs located outside the defense zone of the wildland urban intermix zone: Limit stand-altering activities to reducing surface and ladder fuels through prescribed fire treatments. In forested stands with overstory trees 11 inches dbh and greater, design prescribed fire treatments that have an average flame length of four feet or less. Prior to burning, conduct hand treatments, including handline construction, tree pruning, and cutting of small trees (less than six inches dbh), within a 1- to 2-acre area surrounding known nest trees as needed to protect nest trees and trees in their immediate vicinity. (2001 SNFPA ROD, Appendix A, pg. A-35)	Spotted owl PACs are not a land allocation in this alternative.	Does not apply to this alternative. All the WUI is within the defense zone.	Not addressed in MSA	No diameter limits, except six inches dbh within a 1- to 2-acre area surrounding known nest trees.
In PACs located inside the defense zone of the wildland urban intermix zone: Prohibit mechanical treatments within a 500-foot radius buffer around the California spotted owl activity center. Allow prescribed burning within the 500-foot radius buffer. Prior to burning, conduct hand treatments, including handline construction, tree pruning, and cutting of small tress (less than six inches dbh), within a 1- to 2-acre area surrounding known	Spotted owl PACs are not a land allocation in this alternative.	Same as Alt. B, but no tree cutting or mechanical treatments allowed except for public/firefighter safety.	Not addressed in MSA	No diameter limits, except six inches dbh within a 1- to 2-acre area surrounding known nest trees.

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
nest trees as needed to protect nest trees and trees in their immediate vicinity. The remaining area of the PAC may be mechanically treated to achieve the fuels reduction outcomes described for the general forest land allocation. (2001 SNFPA ROD, Appendix A, pg. A-35)				
California Spotted Owl PACs: Other Impacts				
Evaluate proposals for new roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb nest sites. 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). (2001 SNFPA ROD, Appendix A, pg. A-35)	Same as Alt. B	Same as Alt. B	Not addressed in MSA	Same as Alt. B
California Spotted Owl Home Range Core Areas				
Establish a home range core area surrounding each territorial spotted owl activity center detected after 1986. Home range core area size is 600 acres on the Sequoia National Forest. (2001 SNFPA ROD, Appendix A, pg. A-43)	Spotted owl HRCAs are not a land allocation in this alternative.	Same as Alt. B	Not addressed in MSA	Same as Alt. B
Use aerial photography to delineate the core area. Identify acreage for the entire core area on national forest lands. Delineate core areas to encompass the best available California spotted owl habitat in the closest proximity to the owl activity center. Select the best available contiguous habitat to incorporate: (1) two or more tree canopy layers;	Spotted owl HRCAs are not a land allocation in this alternative.	Same as Alt. B	Not addressed in MSA	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
(2) trees in the dominant and co-dominant crown classes averaging 24 inches dbh or greater; and (3) in descending order of priority, CWHR classes 6, 5D, 5M, 4D, and 4M and other stands with at least 50 percent tree canopy cover (including hardwoods). The acreage in the 300-acre PAC counts toward the total home range core area. Delineate core areas within 1.5 miles of the activity center. (2001 SNFPA ROD, Appendix A, pg. A-43)				
When activities are planned adjacent to non-national forest lands, delineate circular core areas around California spotted owl activity centers on non-national forest lands. Using the best available habitat as described above, designate and mange any part of the circular core area that lies on national forest lands as a California spotted owl home range core areas. (2001 SNFPA ROD, Appendix A, pg. A-43).	Spotted owl HRCAs are not a land allocation in this alternative.	Same as Alt. B	Not addressed in MSA	Same as Alt. B
Fuel treatment standards and guidelines for California spotted owl home range core areas are identical to those presented for old forest emphasis areas above, except for the wildland urban intermix. (2001 SNFPA ROD, Appendix A, pg. A-44)	Spotted owl HRCAs are not a land allocation in this alternative.	Same as Alt. B	Not addressed in MSA	Same as Alt. B
Northern Goshawk PACs				
Delineate northern goshawk protected activity centers (PACs) surrounding all known and newly discovered breeding territories detected on national forest system lands. Designate northern goshawk PACs based upon the latest documented nest	Northern goshawk PACs are not a land allocation in this alternative.	Same as Alt. B	Protect all active goshawk nests until an approved Sequoia National Forest Goshawk Network is established. Nest protection will include 125 acres	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
site and location(s) of alternate nests. If the actual nest site is not located, designate the PAC based on the location of territorial adult birds or recently fledged juvenile goshawks during the fledgling dependency period. (2001 SNFPA ROD, Appendix A, pg. A-36) Delineate PACs to: (1) include known and suspected nest stands and (2) encompass the best available 200 acres of forested habitat in the largest contiguous patches possible, based on aerial photography. Where suitable nesting habitat occurs in small patches, define PACs as multiple blocks in the largest best available patches within 0.5 miles of one another. Best available afforested stands for PACs have the following characteristics: (1) trees in the dominant and co-dominant crown classes average 24 inches dbh or greater; (2) in westside conifer and eastside mixed conifer forest types, stands have at least70 percent tree canopy cover. Non-forest vegetation (such as brush and meadows) should not be counted as part of the 200 acres. (2001 SNFPA ROD, Appendix A, pg. A-36)			of habitat having a restricted operating season from April 1 to August 1 and will include 50 acres of undisturbed suitable habitat surrounding each active nest site. Each project will be examined for active goshawk nests with the results reported in the environmental document for that project. (MSA pgs. 58-59)	
As additional nest location and habitat data become available, review boundaries of PACs and make adjustments as necessary to better include known and suspected nest stands and to encompass the best available 200 acres of forested habitat. (2001	Northern goshawk PACs are not a land allocation in this alternative.	Same as Alt. B	Protect all active goshawk nests… (MSA pgs. 58-59)	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
SNFPA ROD, Appendix A, pg. A-36).				
When activities are planned adjacent to non-national forest lands, check available databases for the presence of nearby northern goshawk activity centers on non-national forest lands. Delineate a 200-acre circular area centered on the activity center. Designate and manage any part of the circular 200-acre area that lies on national forest lands as a northern goshawk PAC. (2001 SNFPA ROD, Appendix A, pg. A-36)	Northern goshawk PACs are not a land allocation in this alternative.	Same as Alt. B	Not addressed in MSA	Same as Alt. B
Prior to undertaking vegetation treatments in suitable northern goshawk nesting habitat that is not within an existing California spotted owl or northern goshawk PAC, conduct surveys using Pacific Southwest Region survey protocols. Suitable northern goshawk nesting habitat is defined as follows: stands with an average tree size of 11 inches dbh or greater and at least 40 percent canopy cover. (SNFPA ROD, Appendix A, pg. A-36)	Prior to undertaking vegetation treatments in suitable northern goshawk nesting habitat, conduct surveys using Pacific Southwest Region survey protocols. Modify project if necessary based on survey results. (Modified from 2001 SNFPA ROD, Appendix A, pg. A-34)	Same as Alt. B	Each project will be examined for active goshawk nests with the results reported in the environmental document for that project. (MSA pgs. 58-59)	Same as Alt. B
When activities are planned within or adjacent to a PAC and the location of the nest site or activity center is uncertain, conduct surveys to establish or confirm the location of the nest or activity center. (2001 SNFPA ROD, Appendix A, pg. A-36)	Northern goshawk PACs are not a land allocation in this alternative.	Same as Alt. B	Each project will be examined for active goshawk nests with the results reported in the environmental document for that project. (MSA pgs. 58-59)	Same as Alt. B
Maintain PACs regardless of northern goshawk occupancy status, unless habitat is rendered unsuitable by a catastrophic stand-replacing event and	Northern goshawk PACs are not a land allocation in this alternative.	Same as Alt. B	Not addressed in MSA	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
surveys conducted to protocol confirm non-occupancy. (2001 SNFPA ROD, Appendix A, pg. A-36)				
Northern Goshawk PACs: Limiting Operating Period				
Maintain a limited operating period (LOP), prohibiting activities within approximately ¼ mile of the nest site during the breeding season (February 15 through September 15) unless surveys confirm that northern goshawks are not nesting. If the nest stand is unknown, either apply the LOP to a ¼ mile area surrounding the PAC or survey to determine the nest stand location. The LOP does not apply to existing road and trail use and maintenance or continuing recreation use, except where analysis of proposed projects or activities determines that either existing or proposed activities are likely to result in nest disturbance. (2001 SNFPA ROD, Appendix A, pg. A-37)	Limited operating periods appropriate for the particular location would be used as needed. (New S&G appropriate for NPS management)	Same as Alt. B	Nest protection will include 125 acres of habitat having a restricted operating season from April 1 to August 1 and will include 50 acres of undisturbed suitable habitat surrounding each active nest site. (MSA pgs. 58-59)	Same as Alt. B
The LOP may be waived for individual projects or activities of limited scope and duration or when a biological evaluation documents that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing, and specific location. Where a biological evaluation determines that a nest site will be shielded from planned activities by topographic features that minimize disturbance, the LOP buffer distance may be reduced. (2001 SNFPA ROD, Appendix A, pg. A-37)	Limited operating periods appropriate for the particular location would be used as needed. (New S&G appropriate for NPS management)	Same as Alt. B	Not addressed in MSA	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
The LOP may be waived where necessary to allow for early season prescribed burning in up to five percent of the northern goshawk PACs on a national forest per year. (2001 SNFPA ROD, Appendix A, pg. A-37)	Limited operating periods appropriate for the particular location would be used as needed. (New S&G appropriate for NPS management)	Same as Alt. B	Not addressed in MSA	Same as Alt. B
Northern Goshawk PACs: Other Impacts				
Evaluate proposals for new roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb nest sites. 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). (2001 SNFPA ROD, Appendix A, pg. A-37)	Same as Alt. B	Same as Alt. B	Each project will be examined for active goshawk nests with the results reported in the environmental document for that project. (MSA pgs. 58-59)	Same as Alt. B
Northern Goshawk PACs: Fuel Treatments				
In PACs located outside the defense zone of the wildland urban intermix zone: Limit stand-altering activities to reducing surface and ladder fuels through prescribed fire treatments. In forested stands with overstory trees 11 inches dbh and greater, design prescribed fire treatments that have an average flame length of four feet or less. Prior to burning, conduct hand treatments, including handline construction, tree pruning, and cutting of small trees (less than six inches dbh), within a 1- to 2-acre area surrounding known nest trees as needed to protect nest trees and trees in their immediate vicinity. (2001 SNFPA ROD, Appendix A, pg. A-37)	Northern goshawk PACs are not a land allocation in this alternative.	Does not apply to this alternative. All the WUI is within the defense zone.	Not addressed in MSA	No diameter limits, except six inches dbh within a 1- to 2-acre area surrounding known nest trees.

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
In PACs located inside the defense zone of the wildland urban intermix zone: Prohibit mechanical treatments within a 500-foot radius buffer around the nest trees. Allow prescribed burning within the 500-foot radius buffer. Prior to burning, conduct hand treatments, including handline construction, tree pruning, and cutting of small tress (less than six inches dbh), within a 1- to 2-acre area surrounding known nest trees as needed to protect nest trees and trees in their immediate vicinity. The remaining area of the PAC may be mechanically treated to achieve the fuels reduction outcomes described for the general forest land allocation. (2001 SNFPA ROD, Appendix A, pg. A-37)	Northern goshawk PACs are not a land allocation in this alternative.	Same as Alt. B, but no tree cutting or mechanical treatments allowed except for public/firefighter safety.	Not addressed in MSA.	No diameter limits, except six inches dbh within a 1- to 2-acre area surrounding known nest trees.
Great Gray Owl Protected Activity Centers (PACs)				
Establish and maintain a protected activity center (PAC) that includes the forested area and adjacent meadow around all known great gray owl nest stands. Delineate at least 50 acres of the highest quality nesting habitat (CWHR types 6, 5D, and 5M) available in the forested area surrounding the nest. Also include the meadow or meadow complex that supports the prey base for nesting owls. (2001 SNFPA ROD, Appendix A, pg. A-38)	Great gray owl PACs are not a land allocation in this alternative.	Same as Alt. B	Not addressed in MSA	Same as Alt. B
Conduct additional surveys to established protocols to follow up reliable sightings of great gray owls. (2001 SNFPA ROD, Appendix A, pg. A-38)	Same as Alt. B	Same as Alt. B	Not addressed in MSA	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Great Gray Owl PACs: Limiting Operating Period				
Apply a limited operating period (LOP), prohibiting vegetation management activities and road construction within ¼ mile of active great gray owl nest stand during the nesting period (typically March 1 to August 15). The LOP does not apply to: (1) existing road traffic and road maintenance, (2) trail uses, and (3) other recreational uses and activities unless a biological evaluation documents that these activities will result in nest disturbance. The LOPP may also be waived for projects of limited scope and duration. (2001 SNFPA ROD, Appendix A, pg. A-38)	Same as Alt. B	Same as Alt. B	Not addressed in MSA	Same as Alt. B
Great Gray Owl PACs: Other Impacts				
Evaluate proposals for new roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb nest sites. 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). (2001 SNFPA ROD, Appendix A, pg. A-38)	Same as Alt. B	Same as Alt. B	Not addressed in MSA	Same as Alt. B
Great Gray Owl PACs: Grazing				
In meadow areas of great gray owl PACs, maintain herbaceous vegetation at a height commensurate with site capability and habitat needs of prey species. Where available, follow regional guidance to determine potential prey species and associated habitat requirements at the project level.	In meadow areas with nesting great gray owls, maintain herbaceous vegetation at a height commensurate with site capability and habitat needs of prey species. (Modified from	Same as Alt. B	Not addressed in MSA	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
	2004 SNFPA ROD, Appendix A, pg. A-61)			
Wolverine and Sierra Nevada Red Fox Detections				
Upon a detection (photograph, track plate, or sighting verified by a wildlife biologist) of a wolverine or Sierra Nevada red fox, conduct an analysis to determine if activities within five miles of the detection have a potential to affect the species. For a two year period following the detection, restrict activities that are determined in the analysis to have an adverse impact from January 1 to June 30. (2001 SNFPA ROD, Appendix A, pg. A-29)	Same as Alt. B	Same as Alt. B	Not addressed in MSA	Same as Alt. B
Fisher Habitat Management				
Assess the impact of fuels management on fisher habitat using models appropriate to the scale of the project.	Assess the impact of fuels management on fisher habitat using models appropriate to the scale of the project.	Assess the impact of fuels management on fisher habitat using models appropriate to the scale of the project.	The forest will use biological evaluations when surveys or historical observations indicate the presence of furbearers within a proposed project area, or when the proposed project may have a potential effect on the species or their critical habitats. Biological evaluations shall be based on surveys of the project area and shall evaluate habitats within the project area in the context of the distribution of the species within the Forest.	Assess the impact of fuels management on fisher habitat using models appropriate to the scale of the project.

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
			Preference, when consistent with Regional guidelines, will be afforded to the fisher in its range from 4,000 to 8,000 feet in elevation and to the marten between 8,000 and 13,000 feet in elevation. (MSA pg. 56)	
Southern Sierra Fisher Conservation Area				
Because the effects of prescribed fire on key components of fisher habitat are uncertain, give preference to mechanical treatments over prescribed fire. However, prescribed fire may be applied to achieve restoration and regeneration objectives for fire adapted giant sequoia. (2001 SNFPA ROD, Appendix A, pg. A-45)	The Southern Sierra Fisher Conservation Area is not a land allocation in this alternative.	The Southern Sierra Fisher Conservation Area is not a land allocation in this alternative.	Exhibit H identifies certain closed canopy (~40%) mature or old growth stands which may meet some of the habitat requirements in the sequoia mediation agreement for furbearers or may have the potential of being identified as critical furbearer habitat. …biological evaluations will be used to determine the potential effects on furbearers and the establishment and maintenance of their critical habitation and viable populations where project proposals impact the above identified areas. Where projects are proposed impacting old growth stands,	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
			disclosure in the EA/EIS will show analysis of such impacts on maintaining adequate old growth resources and need to maintain these areas for furbearer habitat. The Forest Service shall consult with the Dept. of Fish and Game to determine whether these stands should be protected as a means of meeting the habitat/seral stage diversity requirements. (MSA pgs. 57-58)	
In areas outside the wildland urban intermix zone, manage each planning watershed to support fisher habitat requirements. Retain 60 percent of each 5,000- to 10,000- acre watershed in CWHR size class 4 (average dbh of overstory trees between 11 and 24 inches) or greater and canopy cover greater than or equal to 60 percent. (2001 SNFPA ROD, Appendix A, pg. A-45)	The Southern Sierra Fisher Conservation Area is not a land allocation in this alternative.	The Southern Sierra Fisher Conservation Area is not a land allocation in this alternative.	The Forest Plan shall be amended to incorporate management practices, and critical and other habitats, essential to the conservation of these species… (MSA pgs. 56-57)	Same as Alt. B
Prior to vegetation treatments, identify important wildlife structures, such as large diameter snags and coarse woody material within the treatment unit. For prescribed fire treatments, use firing patterns, fire lines around snags and large logs, and other techniques to minimize effects on snags and large logs. (2001 SNFPA ROD, Appendix A, pg. A-45)	The Southern Sierra Fisher Conservation Area is not a land allocation in this alternative.	The Southern Sierra Fisher Conservation Area is not a land allocation in this alternative.	Not addressed in MSA	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Evaluate the effectiveness of these mitigation measures after treatment. (2001 SNFPA ROD, Appendix A, pg. A-45)				
Forest Carnivore Den Sites: Fisher				
Fisher den sites are 700-acre buffers consisting of the highest quality habitat (CWHR size class 4 or greater and canopy cover greater than 60 percent) in a compact arrangement surrounding verified fisher birthing and kit rearing dens in the largest, most contiguous blocks available. (2001 SNFPA ROD, Appendix A, pg. A-39)	Fisher den site buffers are not a land allocation in this alternative.	Same as Alt. B	Not addressed in MSA	Same as Alt. B
Protect fisher den site buffers from disturbance with a limited operating period (LOP) from March 1 through June 30 for all new projects as long as habitat remains suitable or until another Regionally approved management strategy is implemented. The LOP may be waived for individual projects of limited scope and duration, when a biological evaluation documents that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing, and specific location. (2001 SNFPA ROD, Appendix A, pg. A-39) Evaluate the appropriateness of LOPs for existing uses in fisher den site buffers during environmental analysis. (2001 SNFPA ROD, Appendix A, pg. A-39)	Protect active fisher den sites with appropriate limited operating periods if necessary. (New S&G appropriate for NPS management).	Same as Alt. B	Where projects are proposed impacting old growth stands in Exhibit H, disclosure in the EA/EIS will show analysis of such impacts on maintaining adequate old growth resources and need to maintain these areas for furbearer habitat. The Forest Service shall consult with the Dept. of Fish and Game to determine whether these stands be protected as a means of meeting the habitat/seral stage diversity requirements. (MSA pgs. 57-58)	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Avoid fuel treatments in den site buffers to the extent possible. If areas within den site buffers must be treated to achieve fuels objectives for the wildland urban intermix zone, limit treatments to mechanical clearing of fuels. Treat ladder and surface fuels over 85 percent of the treatment unit to achieve fuels objectives. Use piling or mastication to treat surface fuels during initial treatment. Burning of piled debris is allowed. Prescribed fire may be used to treat fuels if no other reasonable alternative exists. (2001 SNFPA ROD, Appendix A, pg. A-39)	Fisher den site buffers are not a land allocation in this alternative.	Same as Alt. B, but mechanical treatments only allowed in WUIs for public/ firefighter safety.	Not addressed in MSA	Same as Alt. B
Evaluate proposals for new roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb den sites. 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). (2001 SNFPA ROD, Appendix A, pg. A-40)	Same as Alt. B	Same as Alt. B	Where projects are proposed impacting old growth stands in Exhibit H, disclosure in the EA/EIS will show analysis of such impacts on maintaining adequate old growth resources and need to maintain these areas for furbearer habitat. (MSA pgs. 57-58)	Same as Alt. B
Forest Carnivore Den Sites: Marten				
Marten den buffers are 100-acre buffers consisting of the highest quality habitat in a compact arrangement surrounding the den site. CWHR in types 6, 5D, 5M, 4D, and 4M in descending order of priority, based on availability, provided highest quality habitat for the marten. (2001 SNFPA ROD, Appendix A, pg. A-39)	Marten den site buffers are not a land allocation in this alternative.	Same as Alt. B	Not addressed in MSA	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Protect marten den site buffers from disturbance with a limited operating period (LOP) from May 1 to July 31 for all new projects as long as habitat remains suitable or until another Regionally approved management strategy is implemented. (2001 SNFPA ROD, Appendix A, pg. A-39) Evaluate the appropriateness of LOPs for existing uses in marten den site buffers during environmental analysis. (2001 SNFPA ROD, Appendix A, pg. A=39)	Protect active marten den sites with appropriate limited operating periods if necessary. (New S&G appropriate for NPS management).	Same as Alt. B	Where projects are proposed impacting old growth stands in Exhibit H, disclosure in the EA/EIS will show analysis of such impacts on maintaining adequate old growth resources and need to maintain these areas for furbearer habitat. The Forest Service shall consult with the Dept. of Fish and Game to determine whether these stands be protected as a means of meeting the habitat/seral stage diversity requirements. (MSA pgs. 57-58)	Same as Alt. B
Avoid fuel treatments in den site buffers to the extent possible. If areas within den site buffers must be treated to achieve fuels objectives for the wildland urban intermix zone, limit treatments to mechanical clearing of fuels. Treat ladder and surface fuels over 85 percent of the treatment unit to achieve fuels objectives. Use piling or mastication to treat surface fuels during initial treatment. Burning of piled debris is allowed. Prescribed fire may be used to treat fuels if no other reasonable alternative exists. (2001 SNFPA ROD, Appendix A, pg. A-39)	Marten den site buffers are not a land allocation in this alternative.	Same as Alt. B, but mechanical treatments only allowed in WUIs for public/ firefighter safety.	Not addressed in MSA	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Evaluate proposals for new roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb den sites. 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). (2001 SNFPA ROD, Appendix A, pg. A-40)	Same as Alt. B	Same as Alt. B	Where projects are proposed impacting old growth stands in Exhibit H, disclosure in the EA/EIS will show analysis of such impacts on maintaining adequate old growth resources and need to maintain these areas for furbearer habitat. The Forest Service shall consult with the Dept. of Fish and Game to determine whether these stands be protected as a means of meeting the habitat/seral stage diversity requirements. (MSA pgs. 57-58)	Same as Alt. B
Willow Flycatcher Habitat				
Evaluate proposals for new concentrated stock areas (for example, livestock handling and management facilities, pack stations, equestrian stations, and corrals) located within 5 miles of occupied willow flycatcher sites.	Same as Alt. B	Same as Alt. B	Not addressed in MSA	Same as Alt. B
As part of landscape analysis, give priority to meadow restoration opportunities near or adjacent to known willow flycatcher sites. (2001 SNFPA ROD, Appendix A, pg. A-61)	Same as Alt. B	Same as Alt. B	Not addressed in MSA	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
To the extent possible, construct no new roads in potential willow flycatcher habitat. Potential willow flycatcher habitat includes: (1) occupied willow flycatcher habitat, (2) known willow flycatcher sites, (3) emphasis habitat, and (4) small, wet woody meadows (meadows less than 15 acres that have standing water on June 1 and a deciduous shrub component. (2001 SNFPA ROD, Appendix A, pg. A-61)	Same as Alt. B	Same as Alt. B	Not addressed in MSA	Same as Alt. B
Continue a four year cycle for conducting willow flycatcher surveys in all known willow flycatcher sites on GSNM. (Modified from 2001 SNFPA ROD, Appendix A, pg. A-61)	Same as Alt. B	Same as Alt. B	Not addressed in MSA	Same as Alt. B
In meadows with **occupied willow flycatcher sites**, allow only late-season grazing (after August 15) in the entire meadow. This S&G may be waived if an interdisciplinary team has developed a site-specific meadow management strategy. This strategy is to be developed and implemented in partnership with the affected grazing permittee. The strategy objectives must focus on protecting the nest site and associated habitat during the breeding season and the long-term sustainability of suitable habitat at breeding sites. It may use a mix of management tools, including grazing systems, structural improvements, and other exclusion by management techniques to protect willow flycatcher habitat.	Same as Alt. B	Same as Alt. B	Not addressed in MSA	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
In willow flycatcher sites receiving late-season grazing, monitor utilization annually using regional range analysis and planning guide. Monitor willow flycatcher habitat every three years using the following criteria: rooting depth cores for meadow condition, point intercepts for shrub foliar density, and strip transects for shrub recruitment and cover. Meadow condition assessments will be included in a GIS meadow coverage. If habitat conditions are not supporting the willow flycatcher or trend downward, modify or suspend grazing.	Same as Alt. B	Same as Alt. B	Not addressed in MSA	Same as Alt. B
For **historically occupied willow flycatcher sites**, assess willow flycatcher habitat suitability within the meadow. If habitat is degraded, develop restoration objectives and take appropriate actions (such as physical restoration of hydrological components, limiting or re-directing grazing activity, and so forth) to move the meadow toward desired conditions.	Same as Alt. B	Same as Alt. B	Not addressed in MSA	Same as Alt. B
Evaluate site condition of **historically occupied willow flycatcher sites**. Those sites that no longer contain standing water on June 1 and a deciduous shrub component and cannot be reasonably restored may be removed from the willow flycatcher site database. As part of the project planning process, survey **emphasis habitat** within five miles of occupied willow flycatcher sites to determine willow flycatcher occupancy.	Same as Alt. B	Same as Alt. B	Not addressed in MSA	Same as Alt. B

Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Emphasis habitat is defined as meadows larger than 15 acres that have standing water on June 1 and a deciduous shrub component. Use established protocols to conduct these surveys. If these surveys determine willow flycatcher occupancy, add these to the database of occupied willow flycatcher sites and include them in the four year survey cycle of willow flycatcher sites described above.				

Items Previously Listed as Standards and Guidelines That Will Be Considered Strategies

Wildlife: General
Maintain habitat to insure all native fish, wildlife and plant species will have adequate population levels and distribution to provide for their continued existence throughout their current range. (LRMP pgs. 4-27)
Provide a diverse range of habitats with riparian areas, montane meadows and late successional forest areas of particular emphasis. (Modified from LRMP pgs. 4-28)
Seek funding for restoration projects that improve wildlife habitat. Give high priority to meadows and riparian areas when funding fish and wildlife habitat projects. (Modified from LRMP pgs. 4-28)
Use approved cooperative deer herd management plans as a guide to deer habitat management. (LRMP pgs. 4-28) Protect sensitive, proposed for listing, and California species of special concern with the long-term objective for removal from Federal listing or to prevent them from being listed. (LRMP pgs. 4-28)
Manage recreation activities by location and period of use based on wildlife needs (e.g., excluding incompatible use from key areas during fawning and/or nesting. (MSA pg. 105) Use seasonal closure as a tool to protect key wildlife values. (LRMP pg. 67)
Leave 10 percent of the area of each re-generation unit with untreated slash for wildlife habitat. (MSA pg. 91)
Utilize management techniques which will minimize charring of downed woody material left for wildlife cover and habitat. (MSA pg. 91)
Promote shade intolerant pine species (sugar pine and ponderosa pine) and hardwoods in westside forest types. (2001 SNFPA ROD, Appendix A, pg. A-28) *Applicable to Alternatives B and F
The Starvation Grove Nest Site and the Breckenridge Mountain Roost Site are managed to maintain condor habitat. The Basket Peak and Lion Ridge roost sites receive modified management to minimize possible conflict with the recovery needs of the condor.

Deleted Standards and Guidelines

Wildlife: General
Focus on habitats outside the planned timber sales when funding habitat improvement projects from sources other than timber sales. (LRMP pg. 4-28) ● No longer applicable due to the proclamation.
Furbearers
a. The Sequoia National Forest will manage habitats and activities for threatened and endangered species to achieve recovery objectives, and for sensitive species, to insure that they do not become threatened or endangered because of Forest Service actions (as specified in FSM 2670). (MSA pg. 55) ● This is already existing Forest Service policy for all TES species.
d. The Forest acknowledges the need to determine the distribution, status and trend of these species and their habitats within the Forest for biological evaluations, interim management, and the Forest Plan amendment. The Forest will request adequate funding through the annual budgeting process to accomplish this in an expeditious manner. The Forest will negotiate with the Region to locate funds if possible for the 1990 field season to commence a systematic, intensive track plate survey of the Forest. In any event, the Region shall provide funds necessary to conduct the survey by the end of the 1991 field season. (Track plate survey will be used unless the Forest Service determines in consultation with Dr. Reg Barrett that another survey method would provide better data.) The track plate survey should include as many other species as practicable. The Forest Service will consult/confer with Dr. Reg Barrett of U.C. Berkeley in designing this survey. (MSA pg. 57) ● These studies were completed.
Vegetation Management Guidelines ● References to eastside pine in the 2001 SNFPA guidelines were deleted. There is no eastside pine within GSNM.
California Condor Management Guidelines in the MSA ● These “requirements shall apply until such time as the revised Condor Recovery Plan is implemented.” The Condor Recovery Plan was revised in 1996.

Alternative E: Forest Emphasis Management Areas (Not Applicable to Alternatives B, C, D, or F)

Mgt Area: (MC1) Mixed Chaparral – Emphasis: general dispersed recreation
Follow Regional coordination guidelines for wildlife habitat improvement on chaparral management projects. (LRMP pgs. 4-47)
Mgt Area: (CF1) Conifer Forest – Emphasis: general dispersed recreation
Protect fisheries and wildlife through compliance with Riparian and Meadow Guidelines. (LRMP pgs. 4-52)
Mgt Area: (CF3) Conifer Forest – Emphasis: developed recreation
Manage wildlife habitat and diversity to enhance recreation. (LRMP pg. 62)
Mgt Area: (WF4) Wilderness with the natural role of fire
Utilize prescribed fire for wildlife habitat improvement work. (LRMP pg. 65)
Mgt Area: (OW5) Wildlife and dispersed recreation in oak woodland
Consider fish and amphibians in habitat improvement projects. (LRMP pg. 67)
Mgt Area: (MC5) Mixed Chaparral – Emphasis: wildlife and dispersed recreation
Develop water supplies on intensively treated lands. (LRMP pg. 69)
Follow regional wildlife coordination guidelines for burning prescriptions. (LRMP pg. 70)
Consider fish and amphibians in habitat improvement projects. (LRMP pg. 67)

Mgt Area: (CF5) Conifer Forest
Maintain an average of 3-5 snags per acre. (LRMP pg. 75)
Protect fisheries and wildlife through compliance with Riparian and Meadow Guidelines. (LRMP pg. 75)
Construct permanent water chances with built in safeguards to protect the aquatic and wildlife communities. (LRMP pg. 75)
Create and/or maintain a vegetative buffer strip along OHV trails and areas designated for OHV use to reduce impacts on wildlife. (LRMP pg. 75)
Mgt Area: (BO6) Blue Oak Savanna – Emphasis: grazing of livestock
Maintain a minimum of 20 square feet of basal area of blue oak where it presently exists. (LRMP pg. 77)
Maintain snags where possible. (LRMP pg. 77)
Mgt Area: (OW6) Oak Woodland – Emphasis: grazing of livestock
Provide for 1.5 snags per acre. (LRMP pg. 80)
Maintain at least 20 square feet basal area per acre of oaks where it currently exists. (LRMP pg. 80)
Maintain understory vegetation to provide horizontal and vertical diversity.
Provide continual supply of oaks. (LRMP pg. 80)
Mgt Area: (MC6) Mixed Chaparral – Emphasis: grazing of livestock
Provide wildlife adaptations in all water developments. (LRMP pg. 82)
Consider wildlife needs for cover and edge in chaparral type conversions and vegetation manipulation projects. (LRMP pg. 82)
Mgt Area: (CF6) Conifer Forest – Emphasis: grazing of livestock
Maintain an average of 1.5 snags per acre. (LRMP pg. 86)
Protect fisheries and wildlife through compliance with Riparian and Meadow Guidelines. (LRMP pg. 86)