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Biological Assessment / Biological Evaluation

Ansel Adams, John Muir, and Dinkey Lakes Wilderness Management Plan

Final Environmental Impact Statement

Inyo and Sierra National Forests

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I. INTRODUCTION

The purpose of this biological assessment is to document the effects of the proposed wilderness area management plan on federally listed Threatened (T), Endangered (E), Proposed (P), and Candidate (C) species. This biological assessment is prepared in compliance with the requirements of Forest Service Manual (FSM) direction 2670 and provides for compliance with Code of Federal Regulations 50 CFR - 402.12.

The biological assessment is part of the biological evaluation process. The Forest Service is directed by FSM 2672.4 to complete a biological evaluation for all Forest Service planned, funded, executed, or permitted programs and activities for possible effects on endangered, threatened, and proposed species. Endangered, threatened, proposed, and candidate species are listed by the USDI Fish and Wildlife Service (FWS) according to the Endangered Species Act (ESA).

The proposed project is a management plan for three wilderness areas shared by two National Forests (NF) (See accompanying map EIS Alternatives). The primary focus of wilderness management is to: a) Provide management direction that will maintain and restore natural wilderness characteristics, ecological processes, and a high-quality recreational wilderness experience; b) Protect wilderness-associated wildlife habitats and species; and c) Mitigate environmental impacts from recreational and associated activities. This document will analyze the preferred alternative, Alternative 1, of the Environmental Impact Statement (EIS) for the Management Direction for the Ansel Adams, John Muir, and Dinkey Lakes Wildernesses. These three wilderness areas encompass vast areas east and west of the crest of the south-central Sierra Nevada mountain range. The Dinkey Lakes wilderness lies entirely on the Sierra NF, and the John Muir and the Ansel Adams wilderness areas are shared between the Sierra and the Inyo NFs. These wilderness areas are bordered on the north by Yosemite National Park (NP), and by Kings Canyon and Sequoia NPs to the south.

Threatened, Endangered, Proposed and Candidate Species that are known to occur within the wilderness areas, or for which suitable habitat occurs are the following:

> Paiute Cutthroat trout (*Onchorhynchus clarki selenris*), Threatened;
> Lahontan Cutthroat trout (*Onchorhynchus clarki henshawi*), Threatened;
> Bald eagle (*Haliaeetus leucocephalus*) Threatened, proposed for delisting,
> Sierra Nevada bighorn sheep (*Ovis canadensis californiania*), Endangered

The following listed species may occur or have habitat on the two national forests involved, but are not affected directly, indirectly, or cumulatively by this proposed project because they either do not occur within the three wilderness areas due to lack of habitat, or they are outside the natural range of the species: California red-legged frog (*Rana aurora draytonii*) (T), California tiger salamander (*Ambystoma californiense*) (C), Giant garter snake (*Thamnophis gigas*) (T), Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (T); Mariposa pussy-paws (*Calyptridium pulchellum*) (T); Owens tui chub (*Gila bicolor snyderi*) (E), Delta smelt (*Hypomesus transpacificus*) (T), Central Valley steelhead (*Oncorhynchus mykiss*) (T), and Sacramento splittail (*Pogonichthys macrolepidotus*) (T). These species will not be considered further in this document.

The content of this biological assessment conforms with legal requirements set forth under Section 7 of the Endangered Species Act (19 U.S.C. 1536 (c), 50 CFR 402), and the standards established in Forest Service Manual direction (FSM 2672.42).

II. CONSULTATION TO DATE

Both the Inyo and Sierra National Forests have been in informal consultation with the FWS Ventura office regarding Sierra Nevada bighorn sheep. Both forests contacted Lee Ann Naue of the FWS by phone and E-mail on 5/16/00. A meeting was held on the Inyo National Forest with members of the Sierra Nevada Bighorn Sheep Advisory Team including Lee Ann of the Ventura FWS office with Gary Milano, Inyo NF wildlife biologist on 5/24/00. The purpose was to determine the scope of the issue with domestic dogs and bighorn and possible mitigation measures. The Inyo informally consulted with the Ventura Office on commercial packer permit renewals (February 1, 2000) and outfitter/guide permit renewals (May 11, 2000) that operate within bighorn sheep habitat in the Ansel Adams and John Muir Wilderness Areas. The Ventura FWS office issued letters dated May 9, and July 12, 2000 concurring with the finding of may affect, not likely to adversely affect for the above consultations. Three Sierra Nevada bighorn informal consultations for domestic sheep allotments outside wilderness in June Lake, Rock Creek, and Bloody Canyon/Algers Allotments were conducted in 2000 between the Inyo NF and the Ventura FWS Office. The U. S. Fish and Wildlife Service (Lee Ann Naue, Ventura) concurred through the adoption of the draft “Domestic Sheep Management Strategy” document developed by the Sierra Nevada Interagency Bighorn Sheep Advisory Team which the FWS was a member. A final version is being prepared by Lee Ann. The Bloody Canyon and Algers Allotments were closed to domestic sheep grazing to bighorn.

Informal phone consultation occurred between Gary Milano, Inyo National Forest wildlife biologist and George Walker of the Barstow FWS Office on November 28, 2000 concerning the Sierra Nevada bighorn sheep and the Revised Wilderness EIS now in preparation.

The Forest Service formally consulted with the USFWS on May 12, 1994 about grazing effects on the Lahontan cutthroat trout (LCT) in the Dinkey and Mugler Allotments on the Sierra NF. The resulting biological opinion (BO) (1-1-94-F-44) was received June 24, 1994. It outlined terms and conditions the Sierra NF needed to follow in order to protect the two LCT populations found only in West Fork Portuguese Creek (Mugler Allotment) and in West Fork Cow Creek (Dinkey Allotment). The USFS Regional Office re-initiated formal consultation on behalf of the Inyo, Sequoia, Stanislaus, Tahoe, and Sierra NFS on December 2, 1994 and on March 29, 1995. On June 6, 1995 a BO (1-1-95-F-42) was received and stated that the proposed action described in the 1994 BO for the Sierra NF was to be incorporated by reference for the ten-year grazing permits. Annual reports on the populations and grazing impacts are submitted to the USFWS.

On June 12, and 21st, 2000, voice mail messages were left with Maria Borja of the Sacramento FWS field office requesting informal consultation regarding the potential for California red-legged frog (*Rana aurora draytonii*) habitat to occur within the wilderness boundary.

Pursuant to 50 CFR 402.12, the National Forests received a species list from FWS that lists current endangered, threatened, candidate, and species of concern that are known or suspected to occur within the county or counties encompassing that particular national forest. The latest list received was Reference Number 1-1-01-SP-0101, dated October 23, 2000 (Inyo and Sierra NFs).

III. CURRENT MANAGEMENT DIRECTION

Current management direction for desired future conditions for Threatened, Endangered, Proposed, and Sensitive species in the John Muir, Ansel Adams, and Dinkey Lakes Wilderness Areas can be found in:

Forest Service Manual and Handbooks (FSM/H 2670).
National Forest Management Act (NFMA).
Endangered Species Act (ESA).
National Environmental Policy Act (NEPA).
Individual Forest Land and Resource Management Plans (LRMPs) (USFS 1988, 1992)
Forest Multiple-Use plans.
Species-specific Recovery Plans, which establish population goals for recovery of threatened and endangered species.
Species management plans.
Species management guides or conservation strategies.
Regional Forester policy and management direction.

The Forest Service direction for Federally listed and proposed species is to manage National Forest Service habitats to achieve recovery objectives so that special protection measures provided under the Endangered Species Act (ESA) are no longer necessary (F.M. 2670.13). Each Forest manages Threatened or Endangered Species per the applicable Recovery Plan, if one exists, in order to meet the Forest's share of Threatened and Endangered species recovery goals.

The USFWS may designate critical habitat for threatened or endangered species. Critical habitat, as defined in the Federal Register, Volume 41, #187, September 24, 1976, could be the entire habitat of the species, or any portion thereof, if any constituent element is necessary to the normal needs or survival of that species.

The only species currently federally proposed is the Cowhead Lake Tui Chub. A Conservation Agreement for this species was completed and signed on October 10, 1999. This species is not present on NFS lands and therefore the Forest Service was not a signatory.

IV. DESCRIPTION OF SELECTED ALTERNATIVE

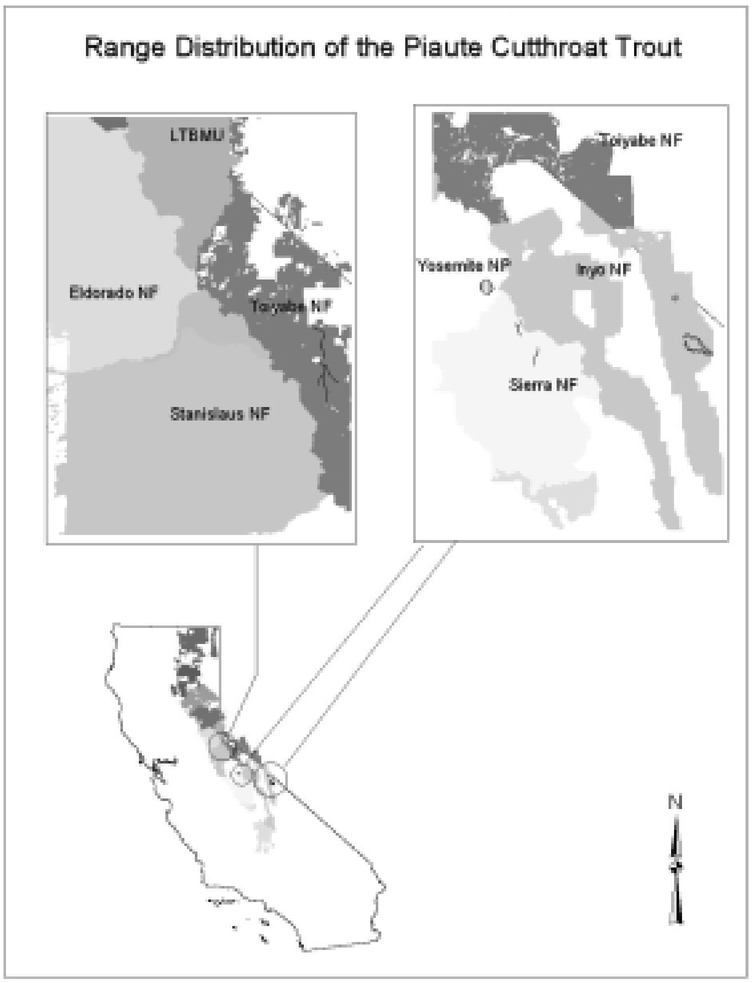
The proposed action is identified as Alternative 1 in the EIS. A complete discussion of this Alternative and the other four Alternatives can be found in Chapter II of the Environmental Impact. All Standards and Guidelines recently adopted in the Sierra Nevada Forest Plan Amendment are incorporated by reference into all Alternatives since the signing of the Record of Decision on January 12, 2001. These standards and guidelines are applicable to the John Muir, Ansel Adams and Dinkey lakes Wilderness areas.

V. EXISTING ENVIRONMENT

A discussion of the Affected Environment can be found in the Final EIS in Chapter III. Species occurrence information within the analysis area is as follows:

1. Piaute cutthroat trout (PCT):

General Distribution: Cutthroat trout (*Oncorhynchus clarki*) are found throughout western North America (Moyle 1976). The native range of the Paiute cutthroat trout (*O. c. seleniris)* was extremely limited - approximately 9.5 miles of stream habitat in Silver King Creek, Alpine County, on the Toiyabe NF (USFWS 1985). California Department of Fish and Game has introduced the subspecies into creeks outside the historic range and basin, and populations have been established in a total of about five miles of habitat on the Sierra and Inyo NFs. Within the Sierra NF, they were transplanted in Sharktooth Lake and Stairway Creek, both within the Ansel Adams Wilderness Area. The fish have abandoned Sharktooth Lake and now are only found within Sharktooth Creek. The Stairway Creek population is considered self-sustaining. Habitat on the Sierra NF is within Designated Wilderness. Paiute cutthroat trout occur on the following Forests the Sierra, Toiyabe (Carson Ranger District) and Inyo.



Status: The Paiute cutthroat trout was listed by the USFWS as Federally-threatened on July 16, 1975 (Federal Register 40:29864), with no Critical habitat designated (USFWS 1985). However, essential habitat has been identified: several tributaries within the Silver King drainage; one mile of Stairway Creek; and 2.5 miles of North Fork Cottonwood Creek (Ibid). The main threats to the survival of this subspecies are: (1) hybridization and competition with introduced salmonids, (2) siltation and channelization of stream habitat, (3) destruction of riparian vegetation and within stream cover, and (4) excessive angling harvest (USFWS unpublished information sheet).

This species is limited to two locations within the planning area: Sharktooth Creek, and Stairway Creek on the Sierra National Forest, Ansel Adams Wilderness. They were introduced into these areas in 1968 and 1972 respectively. Sierra NF personnel surveyed

Sharktooth Creek in 1999 (Strand and Eddinger, 2000) and Stairway Creek in 2000 for population status and stream condition. The total length of occupied stream channel is estimated at about 5 miles. The overall habitat condition of these streams is good, with no deficiencies noted in bank and channel stability, water temperature, or water quality (Strand and Eddinger, 2000). The access to both creeks is relatively difficult. The creeks are in remote locations and both receive only light recreational use. A user-defined trail accesses the middle section of Stairway Creek. Several dispersed campsites also are located in the area. Sharktooth Creek showed less signs of use, with no user-defined trails and only a few old cans found at Sharktooth Lake (Strand and Eddinger, 2000).

Fishing pressure currently is considered low for both populations. There are no angling restrictions on either Stairway or Sharktooth Creeks. Return of CDF&G angler forms in 1997 indicated that only one person had fished Stairway Creek, although another angler had spoke to a wilderness ranger about his fishing success in that creek the same year (Strand and Eddinger, 2000).

Sharktooth Creek lies with the Cassidy Cattle Allotment also in the Ansel Adams Wilderness Area. The Allotment is currently deferred but is subject to re-activation. The Silver Divide separates Sharktooth Creek from the rest of the allotment, and cattle generally do not go over the divide to graze in the Sharktooth basin (Strand, pers. comm., 6/23/2000). Currently there are no impacts from grazing to Paiute Cutthroat habitat. Section 7 consultations (reference 1-1-94-F-40, 1-1-95-F-42) regading the Paiute Cutthroat trout have established conservative measures applicable to the allotments identified above.

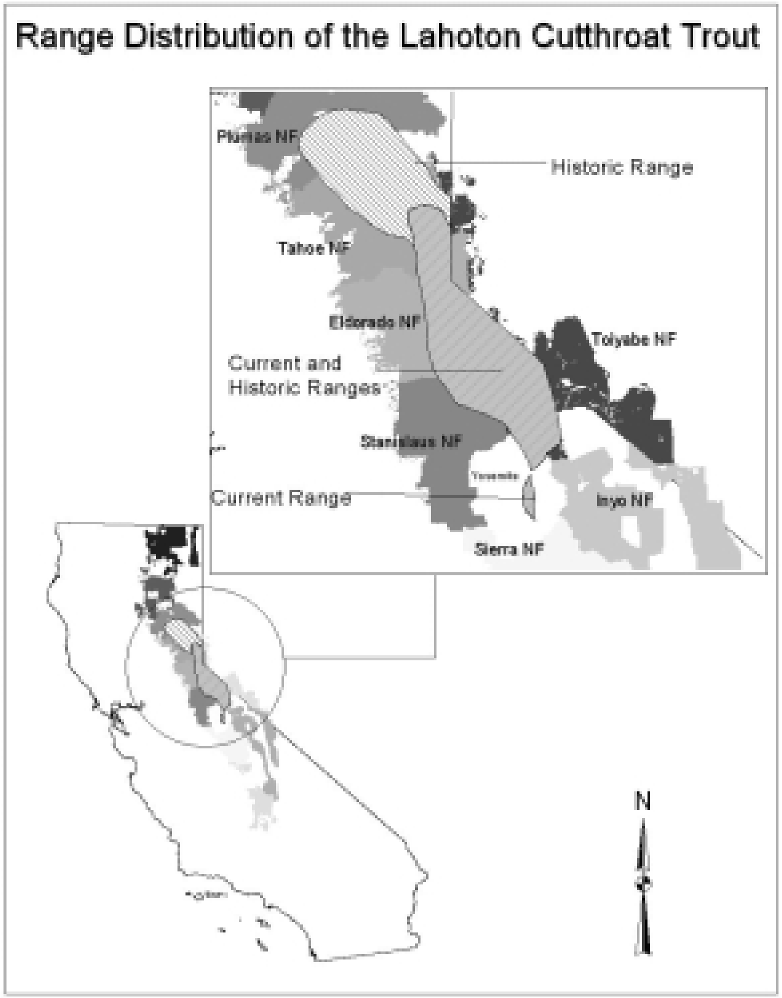
Information compiled from the Inyo and Sierra Fisheries Biologists suggest a stable trend in this species population over the past ten year period on these two forests. Based on survey data, it is estimated that 1,200 individuals occur on all National Forest lands (USFS 2001). Habitat trends for the population as a whole also appear to be stable, with increases in availability in certain areas of habitat improvement (USFS 2001).

Reproductive Biology and Breeding Habitat: Spawning occurs from April to July, with eggs being deposited in one-fourth to one-half inch gravels within riffles, pocket water (pools created by boulders), or pool crests (USFS 1993). Good egg survival requires that spawning beds be relatively silt-free and well oxygenated (USFS 1993). Proper hatching and fry survival generally requires water temperatures of 37° to 64.4°F. (USFS 1993). Within-stream cover appears to be important for fry and juvenile survival (USFS 1993). Although this species can survive in lakes, successful spawning requires access to flowing waters with clean gravel substrates (USFWS 1985).

Diet: Paiute cutthroat trout are opportunistic feeders, preying on aquatic and terrestrial invertebrates that occur in the drift (USFWS 1985). Terrestrial prey items may make up a significant portion of the diet of trout in small headwater streams and meadows during the summer months (USFS 1993).

General Habitat Use: Suitable habitat includes low gradient meadow streams with average water depth at least one-half feet; deeper pools with at least 20 percent submerged cover; and no more than 15 percent stream bank and channel instability (USFS 1993). Stream shading of at least 75 percent is necessary to keep water cool in the summer and reduce winter icing (USFS 1993). Like other western stream-dwelling salmonids, all life stages of the Paiute cutthroat trout require cool, well-oxygenated waters (USFWS 1985).

2. Lahontan cutthroat trout (LCT):



General Distribution: Cutthroat trout *(Oncorhynchus clarki)* are found throughout western North America (Moyle 1976). Historically, the lahontan cutthroat trout (O. c. henshawi) was endemic to the physiographic Lahontan basin of northern Nevada, eastern California, and southern Oregon (USFWS 1992). In California, the subspecies historically occurred in the streams and lakes of the Lahontan system, on the east side of the Sierra Nevada (Moyle 1976). The current distribution is a fraction of the historic distribution, and genetically pure, self-sustaining populations are known to occur on Forest Service lands in only 10 miles of California drainages on the Tahoe NF and Lake Tahoe Basin Management Unit (USFS 1993). In addition, several populations have been established outside the native range on the Inyo, Stanislaus, and Sierra NFs (Ibid).
Potential habitat has been identified in Hell Hole Creek, which is administered by the Lake Tahoe Basin Management Unit (Ibid). Various streams within the Truckee River, Carson River, and Walker River Sub-basins have been identified as candidate reintroduction sites for Lahontans in the California Department of Fish and Game's Lahontan Cutthroat Trout Management Plan (Gerstung 1986). Therefore, the Lahontan cutthroat trout occurs on the following Forests: the Tahoe; Lake Tahoe Basin; Stanislaus; Sierra; and Inyo.

Status: The Lahontan cutthroat trout was listed as endangered in 1970 and reclassified in 1975 as threatened; critical habitat has not been designated (USFWS 1992). The Recovery Plan for the Lahontan Cutthroat Trout (USFWS 1995) established the goals and objective for recovery of the species. Reasons for the decline in numbers of this species include: (1) competition and hybridization with introduced exotic fish species; (2) habitat changes associated with grazing, logging, stream channelization, and water diversions; and (3) commercial and sport over fishing (USFS 1993).

Lahontan cutthroat trout evolved in the absence of other trout species and, consequently, do not compete effectively with other trout (Gerstung 1986). In addition, genetic purity is lost from hybridization with rainbow trout. Presently, barriers separate Lahontan populations from other trout species to ensure their continued viability.

According to information compiled from Forest Fisheries Biologists based on annual population surveys, this species appears to be experiencing a stable to increasing population trend (4,000-6,000 individuals) in the past ten year period. Based on annual habitat and water quality monitoring carried out by the Forest Fisheries Biologists, it is estimated that the habitat trend for this same period is also predicted to be fairly stable, with increasing productivity in areas of habitat improvement projects (USFS 2001).

This species is not found within the Ansel Adams, John Muir or Dinkey Lakes wildernesses. Outside the wilderness there are two populations on the Sierra National Forest; West Fork of Portugese Creek and the West Fork of Cow Creek. The population in the West Fork of Portuguese Creek on the Sierra National Forest is only found south of Primary Forest Road 5S07 (part of the Sierra Scenic Byway). However, the headwaters of West Fork Portuguese Creek are within the wilderness, and water quality impacts can affect the habitat suitability for these fish downstream. Currently no system trails access the headwaters for the West Fork Portuguese Creek. The Resource Management Unit (RMU) in which the headwaters are located is classified as a “moderate” use area for recreational activities.

The West Fork Cow Creek population occurs about two miles west of the Dinkey Lakes Wilderness. Access to the population is on Forest Road 9S10 and 9S62, which also takes visitors to the Dinkey Lakes Wilderness trailhead. No portion of this population’s habitat is within the three wilderness areas.

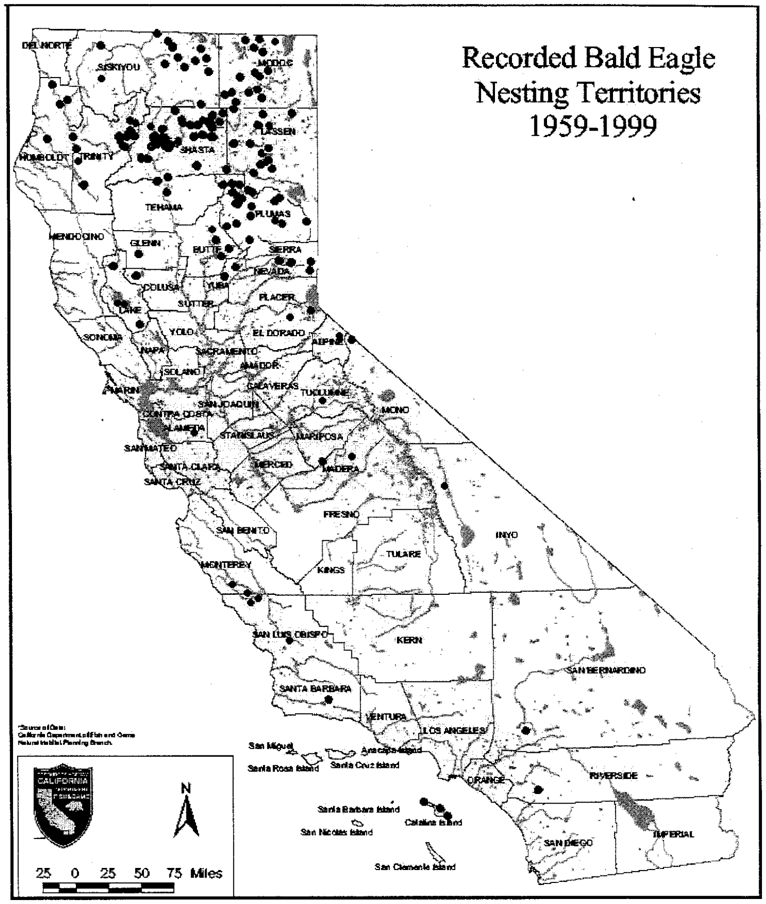
Reproductive Biology and Breeding Habitat: Lahontan cutthroat trout are obligatory stream spawners and spawn from April to July, with eggs being deposited in one-fourth to one-half inch gravels within riffles, pocket water, or pool crests (USFS 1993). Apparently, spawning Lahontans prefer gravels one-fourth to two inches in diameter and water velocities one to two feet per second (Gerstung 1986). Good egg survival requires that spawning beds be relatively silt-free and well oxygenated (USFS 1993). Water temperatures of less than 57°F. are required from April through July for successful reproduction (Bailey and Scoppettone 1979 in Gerstung 1986). Optimum temperatures include averages of 55°F., with maximums less than 72 degrees (USFS 1993).

Diet: Lahontan cutthroat trout are opportunistic feeders, preying on aquatic and terrestrial invertebrates that occur in the drift (USFWS 1992). Terrestrial prey items may make up a significant portion of the diet of trout in small headwater streams and meadows during the summer months (USFS 1993). In lakes, smaller trout feed primarily on surface insects and zooplankton and larger trout feed on other fish (USFWS 1992, USFS 1993). Other prey items include bottom-dwelling insect larvae, crustaceans, and snails (Ibid).

General Habitat Use: Within California, native Lahontan habitat primarily consists of eastern Sierra high mountain meadow streams (over 6,000 feet elevation) (USFS 1993). Optimal habitat for Lahontan cutthroat trout is characterized by: Clear cold water and relatively stable summer water temperatures, with an average maximum summer temperature of less than 43° to 72°F. and variations of no more than 37°F.; one-to-one pool-to-riffle ratios and a relatively silt-free, rocky substrate in the riffle-run area; well-vegetated, stable stream banks; approximately 25 percent of the stream area providing cover; and relatively stable water flow regimes, with daily fluctuations less than 50 percent of the average annual daily flow (Hickman and Raleigh 1982).

Cover is an important habitat component (Ibid). Lahontans occupy areas with overhanging banks, vegetation, or woody debris, and within stream cover (e.g., brush, aquatic vegetation, and rocks) is very important for juvenile survival (USFS 1993).

3. Bald Eagle:



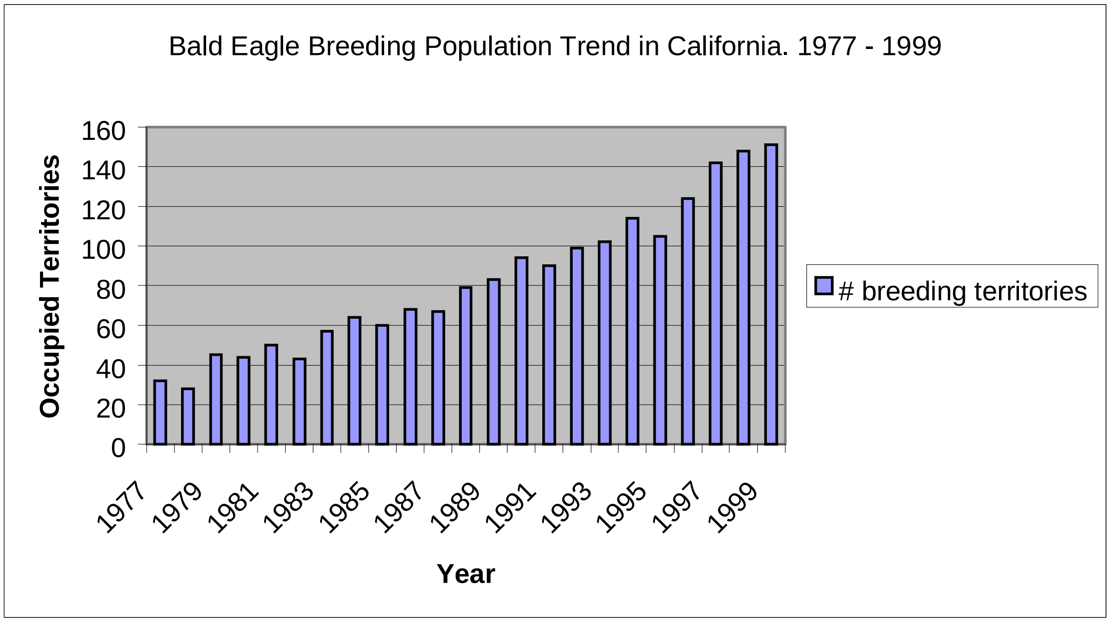
General Distribution:
The bald eagle (*Haliaeetus leucocephalus*) is found throughout most of North America and breeds or winters throughout California, except in the desert areas (Zeiner et al. 1990, DeGraaf et al. 1991). In California, most breeding occurs in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity Counties (Zeiner et al. 1990). California's breeding population of bald eagles is resident year-long 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 the California National Forests, and at least 151-180 pairs remain year-round to breed. There are no known nesting bald eagle territories on the Inyo National Forest, and three on the Sierra National Forest; one at Edison Lake discovered in 2000 adjacent to the John Muir Wilderness, and two others at Shaver and Bass Lakes well outside wilderness.

Status: The bald eagle was listed by the USFWS as a Federal endangered species 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, 1995). Other current threats to the species in the Sierra Nevada include disturbance to nest 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 (USFS 2001).

Critical Habitat is not currently mapped or proposed for the bald eagle in the Sierra Nevada (USFWS 1986). A Recovery Plan was released in 1986 for the recovery and maintenance of bald eagle populations in the 7-state Pacific recovery region (Idaho, Nevada, California, Oregon, Washington, Montana, and Wyoming) (Ibid). This Recovery Plan is being followed on all National Forest lands within the range of the bald eagle.

In the 17 years since it was listed throughout the conterminous 48 States, the bald eagle has clearly increased in number and expanded in range (USFWS 1995). The improvement is a direct result of the banning of DDT, and other persistent organochlorines, habitat protection, and from other recovery efforts (Ibid). On August 11, 1995, the USFWS issued a Final Rule to reclassify the bald eagle from endangered to threatened in all of the lower 48 states. In the Pacific recovery region, which all of the 10 affected Forests are a part of, reclassification goals as set forth in the Recovery Plan have been met (Ibid). The bald eagle was proposed for delisting by the USFWS on July 4th, 1999 (FR Vol.64. No. 128. 36454).

Figure VI-17. Bald Eagle Breeding Population Trend in California, 1977 – 1999.



In addition to a constant upward trend in population, productivity data for the past ten years, figure VI-17 shows that the recovery plan target fledgling rate has been met and relatively constant over this period.

Suitable summer perching and foraging habitat occurs throughout the wilderness particularly around lower elevation forested lakes and rivers with fish or waterfowl populations. Larger trees with heavy, horizontal branches and overhead canopy cover provide roosting and resting habitat. Large trees within proximity (1 mile or so) of lakes, reservoirs, or rivers with dependable food supplies (fish and waterfowl) can provide nesting habitat. The alpine, subalpine, and upper montane areas within the John Muir, Absel Adams and Dinkey Lakes Wilderness Areas appear to be unsuitable for nesting habitat because of the harsh climate. Eagles usually begin territorial establishment and nesting in mountain habitats beginning in early spring. Habitat that might otherwise be suitable from a nest tree structural component in these Wildernesses is unsuitable during this time because the lakes are still frozen well into late spring. Wintering habitat is limited as well since lakes are completely frozen over except for small areas of open water at inlets and outlets and along stream and river courses.

Florence Lake (elev. 7,328 feet) and Edison Lake (elev. 7,643) have sightings of bald eagles. The two reservoirs are approximately 7 air miles apart and are typical of man-made lakes that provide high quality nesting and foraging habitat. Both lakes are large reservoirs with main road access and heavy recreational use by boaters, fishermen, and campers. The surrounding ridges are within the John Muir and Ansel Adams Wilderness Areas. A bald eagle nest has been identified at Edison lake outside the wilderness boundary.

Specific consultation with the U. S. Fish and Wildlife Service will need to be conducted. Two other reservoirs are located further south that also may be suitable for occupancy by nesting bald eagles. Courtright Resevoir (8,700 feet), and Wishon Resevoir (6,539 feet) are near the edge of the John Muir and Dinkey Lakes Wilderness Areas. Suitable nesting habitat has not been assessed around these lakes in the adjacent wilderness. The remainder of the wilderness areas are not consider suitable nesting habitat since no additional reservoirs are located adjacent to their boundaries. In the summer months, eagles occasionally can be seen flying over higher elevation lakes. It is highly likely that they forage for fish or waterfowl in wilderness lakes.

The fish-stocking program has increased the amount of prey available to eagles within the wilderness though there are no records to indicate habitual use of any identified lake in the John Muir, Ansel Adams, or Dinkey Lakes Wilderness Areas as foraging habitat. A recent decision by California Department of Fish and Game to suspend fish stocking in the wilderness lakes of the Sierra will have a dramatic effect on eliminating or substantially reducing fish in many of the formerly stocked lakes.

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 (USFS 1992). The breeding season normally ends approximately August 31, as the fledglings are no longer attached to the immediate nest site (Ibid). This time frame may vary with local conditions and knowledge (Ibid). 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 thru August, the fledglings remain restricted to the nest until they are able to move around within their environment. 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).

Table VI-46. Bald eagle breeding population data for California, 1990-1999

Year	Known Territories	Territories Surveyed	Territories Occupied	Number of Young Produced	Average Number of Young Fledged per Territory*
1990	107	102	94	95	1.1
1991	111	105	90	82	1.0
1992	120	110	99	82	1.1
1993	127	116	102	103	1.1
1994	142	129	116	120	1.1
1995	146	129	105	89	0.9
1996	160	144	124	128	1.1
1997	171	160	142	140	1.1
1998	180	168	148	125	0.9
1999	188	180	151	138	1.0

** Calculated only for those occupied territories at which the outcome of breeding success was known.*

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).

In the Pacific Northwest, bald eagle nests are usually located in uneven-aged (multi-storied) stands with large, old trees (Anthony et al. 1982). Most nests in California are located in ponderosa pine and mixed-conifer stands and nest trees are most often ponderosa pine (*Pinus ponderosa*) (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 (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). A survey of nest trees used in California found that about 71 percent were ponderosa pine, 16 percent were sugar pine (*Pinus lambertiana*), and 5 percent were incense-cedar (*Librocedrus decurrens)*, with the remaining 8 percent distributed among five other coniferous species (Lehman 1979).
Seventy percent of the nest trees surveyed were classified as highly or very highly susceptible to beetle infestation, probably a function of eagle's using mature and over mature trees (Ibid). Ninety-three percent of the nest trees were 21-60 inches in diameter (mean diameter was 43.1 inches) and 92 percent were greater than 76 feet tall (mean height was 111.9 feet) (Ibid). Seventy-three percent of the nest sites were within one-half mile of a body of water, 87 percent within one mile, and none were over two miles from water (Ibid). Other trees, such as snags, trees with exposed lateral limbs, or trees with dead tops, are often also present in nesting territories and are used for perching or as points of access to and from the nest. Such trees also provide vantage points from which territories can be guarded and defended. Nearby trees may also screen the nest from human disturbances or provide protection from wind damage (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 eagle 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 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 on the ten affected Forests has primarily remained in stable condition over the past ten years (USFS 2001).

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 the forest stands with old (mean age of roost trees was 236 years), open-structured trees that were 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 eagles can adversely affect eagle distribution and behavior (Stalmaster and Newman 1978).

4. Sierra Nevada Bighorn:

General Distribution:
The historical range of the Sierra Nevada bighorn sheep includes the eastern slope of the Sierra Nevada, and, for at least one subpopulation, a portion of the westerns slope, from Sonora Pass in Mono County south to Walker Pass in Kern County, a total distance of about 346 kilometers (215 miles) (Jones 1950; Wehauser 1979, 1980). By the turn of the century, about 10 out of 20 sub-populations survived. The number dropped to five subpopulations at mid-century, and down to two sub-populations in the 1970s, near Mouint Baxter and Mount Williamson in Inyo County (Wehauser 1979). Currently, five subpopulations of Sierra Nevada bighorn sheep occur, respectively at Lee Vining Canyon, Wheeler Crest, Mount Baxter, Mouint Williamson, and Mount Langley in Mono and Inyo Counties.

Status: The Mountain sheep (*Ovis canadensis*) is fairly uncommon in California and, until 1979, the California bighorn sheep (*O. c. californiana*), one of three subspecies found in California, only occurred in two herds totaling 195 animals in the southern Sierra Nevada (Mt. Baxter and Mt. Williamson) (Ziener et al. 1990b, CDFG 1991). The Sierra Nevada distinct population segment was emergency listed effective April 20, 1999. A proposed rule to list the Sierra Nevada bighorn sheep as endangered was published concurrently with the emergency rule (FR/Vol. 64, No. 75, 19300-19308). The Final Rule was published in the Federal Register January 3, 2000 listing the California Bighorn Sheep as Endangered.

It has been reintroduced into Inyo and Mono Counties on the Inyo NF, and into the South Warner Wilderness in Modoc County of Modoc NF. In spite of the reintroduction of almost 300 animals, only 80-150 remain on Inyo NF. The Inyo herd has declined steadily since the harsh winter of 1994. This is primarily due to increased stress in the herd and as a result, increased predation by mountain lions. The Modoc NF herd of 50 animals was lost in 1988 to pneumonia. The bighorn sheep is found in a variety of habitats associated with rocky, steep slopes and canyons (Ibid).

A recent analysis of the taxonomy of the bighorn sheep using morphometrics and genetics failed to support the current taxonomy (Ramey 1993, Wehausen and Ramey 1993; Wehausen and Ramey 2000 (in review). This and other research (Ramey 1993) supports taxonomic distinction of the Sierra Nevada bighorn sheep relative to other nearby regions.

The biological evidence supports recognition of Sierra Nevada bighorn sheep as a distinct vertebrate population segment for purposes of listing. (61 FR 4722).

General Habitat and Biology: Current and historical habitat of the Sierra Nevada bighorn sheep is almost entirely on public land managed by the U.S. Forest Service (FS), Bureau of Land Management (BLM), and National Park Service (NPS). The Sierra Nevada mountain range is located along the eastern boundary of California. Peaks vary in elevation fro 6,000 to 8,000 ft in the north to over 14,000 ft. in the souith adjacent to Owens Valley, and then drop rapidly in elevation in the southern extreme end of the range (Wehausen 1980). Approximately 119,000 acres have been identified as suitable habitat of which 79,932 acres are with the John Muir and Ansel Adams Wilderness Areas exclusively on the Inyo National Forest.

Sierra Nevada bighorn sheep inhabitat the alpine and subalpine zones during the summer, using open slopes where the land is rough, rocky, sparsely vegetated and characterized by steep slopes and canyons (Wehausen 1980: SNBSIAG 1997). Most of these sheep live between 10,000 and 14,000 ft. in elevation in summer months (USFS 2001). In winter, they occupy high, windswept ridges, or migrate to the lower elevation sagebrush-steppe habitat as low as 4,800 ft. to escape deep winter snows and find more nutritiouis forage. Bighorn sheep tend to exhibit a preference for south-facing slopes in the winter (Wehausen 1980). Lambing areas are on safe precipitous rocky slopes. They prefer open terrain wher they are better able to see predators. For these reasons, forests and thick brush usually are avoided. Normally, the bighorn sheep would winter at the base of the eastern Sierra slope, where weather conditions are milder and forage is available. However, due to increased predation from mountain lions, the bighorn sheep have remained at higher elevations where the climate is harsher and forage is less available. All age classes of bighorn, and particularly lambs have become more vulnerable to mortality from weather events as a result.

Bighorn sheep are primarily diurnal, and their daily activity show some predictable patterns that consist of feeding and resting periods (Jones 1950). Bighorn sheep are primarily grazers; however, they may browse woody vegetation when it is growing and very nutritious. They are opportunistic feeders selecting the most nutritiouis diet from what is available. Plants consumed include varying mixtures of grasses, brownse (shoots, twigs, and leaves of trees and shrubs), and herbaceouis plants, depending on season and locations (Wehausen 1980). In a study of the Mount Baxter and Mount Williamson subpopulations, Wehausen (1980) found that grass, mainlyu *Stipa speciosa* (perennial needlegrass) is the primary diet item in winter. As spring green-up progresses, the bighorn sheep shift from grass to a more varied browse diet, which includes *Ephedra viridis* (Mormon tea), *Eriogonum fasciculatum* (California buckwheat), and *Purshia* species (Bitterbrush).

Sierra Nevada bighorn sheep are gregaroius, with group size and composition varying with gender and from season to season. Spatial segregation of males and females occurs outside the mating season, with males more than 2 years old living apart from females and younger males for most of the year (Jones 1950; Wehausen 1980). Ewes generally remain in the same band into which they were born. During the winter, Sierra Nevada bighorn sheep concentrate in those areas suitable for wintering, preferrably Great Basin habitat (sagebrush-steppe) at the very base of the eastern escarpment. Subpopulation size can number more than 100 sheep, including rams (this was observed at a time when the population size was larger than it is currently) (USFS 2001).

Reproductive Biology and Breeding Habitat: Breeding takes place in the fall, generally in November (Geist 1971). Single births are the norm for North American wild sheep, but twinning is known to occur (Wehausen 1980) Gestation is about 6 months. Lambing occurs between late April to early July, with most lambs born in May or June (Wehausen 1980, 1996). Ewes with newborn lambs live solitarily for a short period before joining nursery groups that average about six sheep. Ewes and lambs frequently occupy steep terrain that provides a diversity of slopes and exposures for excape cover. Lambs are precocious, and with a day or so, climb almost as well as the ewes. Lambs are able to eat vegetation within 2 weeks of their birth and are weaned between 1 and 7 months of age. By their second spring, they are independent of their mothers. Female lambs stay with ewes indefinitely and may attain sexual maturity during the second year of life. Male lambs, depending upon physical condition, may also attain sexual maturity during the second year of life (Geist 1971). Average lifespan is 9 to 11 years in both sexes, though some rams are known to have lived to 12 t0 14 years old (Geist 1971); Wehausen 1980).

Diet and Foraging Habitat: Bighorn sheep graze and browse on various plant species, but prefer green, succulent grasses and forbs (Zeiner et al. 1990). This species forages in open habitats, such as rocky barrens, meadows, and low, sparse brushlands (Ibid).

VI. EFFECTS OF THE PROPOSED PROJECT

Compliance with Management Direction

1. This proposal complies with the Recovery Plans for the Paiute cutthroat trout, Lahontan cutthroat trout, and bald eagle. It will comply with the recovery plan for the Sierra bighorn sheep when that plan is finalized. The potential effects described below, with mitigations, will not conflict with the goals of the recovery plans under consideration.

2. No part of this proposed management plan would supercede or change existing management direction for any of the threatened or endangered species considered in this analysis. Future standards and guidelines required in management, conservation, or recovery plans for current or future TEP species will be followed.

3. Concurrent implementation of the Sierra Nevada Forest Plan Amendment (ROD signed 1/12/01) will provide additional Standards and Guidelines for management of these species within the wilderness.

<u>Paiute Cutthroat Trout:</u>

Direct and Indirect Effects

All Alternatives

There will be no directs or indirect effects related to the Paiute Cutthroat trout from implementation of any alternative. Such effects as loss of individual fish, loss of specific habitat features (undercut banks, spawning beds, etc) or localized reductions in habitat quality (sedimentation, loss of riparian vegetation, etc.) are not anticipated to occur.

All Alternatives do not alter the current distribution and number of wilderness users, or the level and types of recreational and management activities taking place currently within the areas occupied by the Paiute Cutthroat trout. Under all alternatives there should be no change to the light recreation camping use adjacent to Paiute habitat currently evident associated with the user defined trail on Strairway Creek. The trail is relatively obscure, and will not be maintained. Most use will continue to occur in the deer hunting season by a few hunters. No commercial or recreational packstock use is anticipated since there is little opportunity for camps and no forage for packstock along the creek.

The currently rated good habitat condition, and population status of the Paiute Cutthroat trout should be unaffected by implementation of any alternative since recreational camping use will not change from the light use the Creek now receives.

The increase in the minimum distance of campsite to water in Alternatives Modified-1, 1 and 2 may result in a slight decrease in sediment input and vegetation loss in riparian areas, a benefit to the trouts habitat. Since only a few dispersed campsites are located near Stairway Creek, and an unknown number of these may fall within the excluded buffer, the potential degree of impact reduction will likely be small.

Cattle grazing is not a major concern since they do not access these creeks. Stairway Creek is within the 77 Corral Allotment. This unit remains closed to commercial livestock grazing since 1964. Sharktooth Creek is within the Cassidy Allotment , an active grazing allotment. The Sheep Camp Unit which contains Sharktooth Creek remains closed in order to protect Paiute cutthroat trout habitat.

Standards and Guidelines implemented as part of the Sierra Nevada Forest Plan Amendment in Riparian Conservation Areas will provide additional habitat protection measures for this species (USFS 2001). Specifically Riparian Conservation Objective (RCO) #1 Standards and Guidelines require implementation of soil quality standards for soil loss, detrimental soil compaction, and organic matter retention to minimize the risk of sediment delivery to aquatic systems from management activities. Additionally, identify existing and potential sources of sediment delivery to aquatic systems. Implement preventive and restoration measures, such as modifying management activities, increasing ground cover, reducing the extent of compacted surfaces, or revegetating disturbed sites to reduce or eliminate sediment delivery from these sources to aquatic systems.

RCO objective #2 states in stream reaches occupied by, or identified as “essential habitat” in the conservation assessment for Lahontan and Paiute cutthroat trout…limit streambank disturbance from livestock to 10 percent of the occupied or “essential habitat” stream reach. Riparian Conservation Objective #6 requires identification and implementation of restoration actions to maintain, restore or enhance water quality and maintain, restore, or enhance habitat for riparian and aquatic species. It further states to recommend and establish priorities for restoration practices in areas with compaction in excess of soil quality standards, and the identification of other management practices…recreational use…that may be contributing to the observed degradation.

Specific Standards and Guidelines that provide additional protection for all streams, lakes and riparian areas include RCA14, RCA18, RCA19, RCA39, RCA4, RCA40, RCA41, RCA6.

Cumulative Effects

Air pollution could be an issue if chemical contaminants are being carried by the air mass from the San Joaquin Valley and deposited into wilderness water bodies. Currently the extent of this concern is not known regarding the populations of Paiute CTT, but in other areas of the United States, similar air-borne contamination problems have resulted in detrimental effects to aquatic communities.

Fishing regulated by the California Department of Fish and Game has the potential to affect the Paiute Cutthroat Trout. Fish stocking both legal and illegal does not appear to be an issue in these creek reaches. The streams are providing good habitat, with migration barriers that prevent introgression with other introduced trout species.

Monitoring

Continue monitoring of Paiute Cutthroat trout. The Paiute CTT should be monitored at least every 5 years according to the recommendations in "Status of Paiute cutthroat trout (*Oncorhynchus clarki seleniris*) on the Sierra National Forest" (Strand and Eddinger, 2000). Maintain management options such as increased riparian protections or restrictions on angling if habitat or population conditions fail to meet standards set in the approved recovery plans.

Determination

Based on the above assessment of direct and indirect effects, it is my determination that the implementation of any of the Alternatives for the Ansel Adams, John Muir, and Dinkey Lakes Wilderness Management Plan Final Environmental Impact Statement may affect but will not likely adversely affect the Paiute Cutthroat Trout. There is no critical habitat designated for the species therefore the implementation of the alternative will not affect any critical habitat.

This determination is based on the following:

1. Currently, both populations of the Paiute CTT meet the intent of the recovery plan within these stream reaches. Habitat and population surveys indicate good conditions. Implementation of any of the Alternatives will not cause additional recreational use to occur within the Paiute CTT habitat or any additional direct or indirect effects than are currently occurring.

2. More stringent minimum campsite-to-water distances of up to 100 feet in Alternatives 1-Modified, 1 and 2 may slightly increase riparian habitat and water quality. All Alternatives do not increase or decrease current levels of use and impacts to the areas occupied by the Paiute CTT

3. There are no indications of commercial or recreational packstock grazing impacts to Pauite Cutthroat Trout habitat in these stream reaches, nor is it anticipated implementation of any of the Alternatives will change this since the trail into is a user-defined trail, and relatively obscure except to recreationists who already know about it. Stairway Creek receives light use currently and no grazing or packer campers are present that are adversely affecting Paiute CTT habitat.

Lahontan Cutthroat Trout:

All Alternatives

Direct and Indirect Effects

Since the Lahontan cutthroat trout does not occur within the analysis area, there will be no direct effects resulting from implementation of any Alternative. Downstream habitat for the Lahontan outside the wilderness boundary could be indirectly affected by upstream recreational use in the headwaters of West Fork Portuguese Creek from potential increased sediment contribution into the stream from vegetation loss and soil compaction related to campsites and user trails. The level of this effect cannot be quantified, but it is expected to be small due to the lack of established camping areas adjacent to the headwaters of West Fork Portuguese Creek, and the lack of system trails accessing the area. Riparian Conservation Objectives numbers 1 and 6 of the Sierra Nevada Forest Plan Amendment provides language to take action where upstream water quality and habitat problems may be occurring as already described for the Paiute Cutthroat Trout above (USFS 2001). Similarly Specific Standards and Guidelines that provide additional protection for all streams, lakes and riparian areas include RCA14, RCA18, RCA19, RCA39, RCA4, RCA40, RCA41, RCA6.

All Alternatives will not increase or decrease the current, low level of recreational use in and around the headwaters of the West Fork of Portuguese Creek. The increase in minimum campsite distance to water under Alternatives 1-Modified, 1 and 2 may result in a slight decrease in camping-related impacts to riparian areas and the water quality in adjacent stream courses, a benefit to the populations habitat.

Cumulative Effects

Air pollution could be an issue if chemical contaminants are being carried by the air mass from the San Joaquin Valley and deposited into wilderness water bodies. Currently the extent of this concern is not known regarding the populations of Lahontan Cutthroat Trout, but in other areas of the United States, similar air-borne contamination problems have resulted in detrimental effects to aquatic communities.

Fish stocking both legal and illegal does not appear to be an issue in the West Fork of Portuguese Creek.

Monitoring

Monitoring of Lahontan Cutthroat Trout populations and stream condition within the occupied sub-watersheds will occur approximately every 2 years. Maintain management options such as increased riparian protections or restrictions on angling if habitat or population conditions fail to meet standards set in the approved recovery plans.

Determination

Based on the above assessment of direct and indirect effects, it is my determination that the implementation of any of the Alternatives for the Ansel Adams, John Muir, and Dinkey Lakes Wilderness Management Plan Final Environmental Impact Statement may affect but will not likely adversely affect the Lahontan Cutthroat Trout. There is no critical habitat designated for the species therefore the implementation of the alternative will not affect any critical habitat.

This determination is based on the following:

1. This species does not occur within the planning area. The headwaters of the stream reach in which the species occurs do lie within the planning area. The area around these headwaters receives a low level of recreational use. Current human impacts are minimal and the stream condition is good. No system trails access the area. This proposal will not increase the use of the headwaters area.

2. More stringent minimum campsite-to-water distances may slightly increase riparian habitat and water quality in that area for Alternatives Modified-1, 1 and 2.

<u>Bald Eagle:</u>

All Alternatives

Direct and Indirect Effects

Implementation of all alternatives will have no effect on nesting bald eagles since the nest on Edison Lake is located outside wilderness. The eagles have habituated to high levels of human presence just by virtue that they have established a territory in a heavy recreational use lake environment. Nesting eagles are probably in view of heavy human recreational use on the Lake. No doubt they are exposed to high levels of disturbance within their foraging habitat by motorboats and heavy human recreational use outside the wilderness. Bald eagles throughout the northwest have demonstrated substantial tolerance to human presence when it is not a direct threat to the nest, or when the disturbance occurs away from the immediate nest zone. There are numerous examples of successfully nesting eagles around high use recreational reservoirs in Oregon and California outside wilderness where the disturbance is dramatically greater, yet eagles remain highly productive year after year.

Temporarily displacement of eagles from foraging and roosting perches throughout the year may occur at any water body where fish or waterfowl provide a food source to eagles, predominantly in summer around lakes, streams, and rivers. This effect is of minimal consequence to the use of an area by eagles within the wilderness areas since any eagle use is likely to be by non-breeding, or post-breeding individuals. Eagles may move to other perches, or leave the area temporarily depending on the nature of the encounter and degree of habituation of the eagle to human presence. Implementation of any of the alternatives will not substantially affect current patterns of human uses (hiking, riding, camping, and fishing) over the wilderness landscape that would likely alter the potential for disturbance from the existing situation.

There is no evidence that eagles winter forage, or have communal winter roosts within the wilderness. It is not anticipated that implementation of any alternative would preclude eagles from wintering within wilderness since it has been amply demonstrated that eagles forage successfully in areas with substantially more human use around high intensity recreational use reservoirs in Oregon and California. Locally on the Sierra National Forest outside wilderness, bald eagles are successfully nesting at high use recreational reservoirs at Bass Lake and Shaver Lake. Structural habitat characteristics, for nesting, and roosting opportunities within the wilderness will not be affected since no management of vegetation is proposed.

Cumulative Effects

Aerial fish stocking by the California Department of Fish and Game can alter forage availability for bald eagles on a yearly basis. Since use of the wilderness by eagles for foraging has been observed to be minimal this effect is of little consequence to the population.

Monitoring

Monitoring of eagle use in wilderness will occur through observations of the Wilderness Rangers and other Forest Service staff during the normal course of their work. If any eagle nests or winter foraging areas are found within the wilderness areas the Forests will re-initiate consultation with the FWS to determine if any mitigation, or additional monitoring requirements are needed.

Determination

Based on the above assessment of direct and indirect effects, it is my determination that the implementation of any of the Alternatives for the Ansel Adams, John Muir, and Dinkey Lakes Wilderness Management Plan Final Environmental Impact Statement may affect but will not likely adversely affect the Bald Eagle. There is no critical habitat designated for the species therefore the implementation of the alternative will not affect any critical habitat.

This determination is based on the following:

1. The recently discovered bald eagle nest associated at Edison Lake is outside wilderness.
   Wilderness recreation use will not affect the nesting success of the birds.

2. Bald eagle use of the planning area is incidental over the vast majority of the wilderness and limited to summer foraging by non-breeding and post-breeding eagles. Nesting and winter foraging habitat suitability for bald eagles is limited and probably non-existent due to elevation and long winters. Suitable habitat may exist within the planning area. Implementation of any Alternative will not alter existing habitat in the planning area. Since eagles are currently successfully nesting in developed recreation areas with a great deal of use, in can be inferred that the much lower level of recreational activity in wilderness should not deter eagle use of suitable areas.

3. Any future nesting, communal roosting, or foraging concentrations of bald eagles will undergo informal consultation with the U.S. Fish and Wildlife Service as they are discovered.

Sierra Nevada Bighorn Sheep:

Direct and Indirect Effects

Alternative 1-Modified

Under Alternative I-Modified bighorn herd ranges on Mt. Langley, Wheeler Ridge and Mt. Dana-Parker Pass Area will have trailhead quotas restricting overall overnight use. Use is anticipated to remain at approximately the same levels as the existing situation. Out of 79,932 acres of bighorn habitat within the John Muir and Ansel Adams Wilderness Areas, 74,607 acres (93%) of habitat will be in Recreation Use Category 1 (Low levels of use dispersed across the landscape); 4,376 acres (6%) will be in Recreation Use Category 2 (Moderate levels of use dispersed across the landscape); and 949 acres (1%) will be in Recreation Use Category 3 (Visitor Management Areas).

Bighorn habitat will almost be entirely in Recreation Category 1. This alternative may result in somewhat fewer bighorn-human encounters and associated potential for disturbance to sheep in the high country, assuming this lower level of human use dispersed across the landscape category equates to fewer overnight campers being able to access the high country bighorn inhabit.

Day use hiking, and off-trail travel in the Mt. Langley, Wheeler Ridge and Mt. Dana-Parker Pass Area 3 herd ranges outside the Zoological Area will not be controlled, in contrast to the existing seasonal restrictions inside the Zoological Area of the Mt. Baxter and Mt. Williamson herd ranges. Higher levels of encounter between humans and sheep, and subsequent disturbance potential are anticipated than for the Zoological Area herds, particularly on Mt. Langley and Mt. Dana area since day use and overnight hikers have access to the high peaks and ridges where sheep are likely to be approached from above. However since human use is not anticipated to increase in these areas disturbance potential will remain the same. Most of the human disturbance in the Mt. Dana area will actually occur from hikers accessing the Yosemite National Park side of suitable habitat, since the Forest side is much more rugged and inaccessible. Site specific monitoring of bighorn sheep and human use overlap in these areas outside of the Zoological Area has not indicated any adverse effects occurring to sheep movements, productivity or survival (Wehausen 2000).

Wehausen's (2000) considered the expert for Sierra Nevada bighorn sheep has concluded for all herds that while human-sheep encounters occur, bighorn have become habituated to predictable encounter areas with recreationists. The nature of the terrain provides bighorn with sufficient habitat easily accessed for escape, and carrying on daily activities so that human encounters do not adversely affect sheep survival.

The potential for adverse effects on sheep from the presence of dogs in bighorn habitat has been mitigated within the wilderness since they are currently prohibited from bighorn habitat by Inyo National Forest Order # 04-00-01. This order remains in effect until November 30, 2001 after which a new environmental assessment will be prepared to determine if it should remain in place, revised, or be terminated based on recommendations from the Bighorn Sheep Recovery Team.

Prior to the development of the Wehausen (2000) report researchers had continued to debate the impact on bighorn of human use of the wilderness within sheep habitat. A variety of sheep responses have been observed depending on the degree of disturbance to bighorn sheep. Sheep have been observed to stop whatever activity they are engaged in upon observation of humans, continue with their activity while observing the disturbance, move varying distances in a slow flight response, or flee rapidly (Hicks and Elder 1979). The degree of effect appears dependent on a variety of factors such as herd size, the distance sheep were to the human encounter, the degree of habituation sheep have developed to human presence, time of year of disturbance, distance of sheep from escape terrain, whether sheep encounter humans approaching from above or below, and whether humans have dogs with them (Hicks and Elder 1979, MacArthur et al. 1982, Wehausen 1979). Sheep and particularly ewes with lambs can elicit strong flight responses when humans approach them from above or if they come between sheep and escape terrain (Wehausen 1979).

Hicks and Elder 1979 concluded in their study of human disturbance to bighorns in the John Muir Wilderness Area that foot trails through the Mt. Baxter summer range did not adversely affect sheep movements. They observed ewe, lamb and yearling groups on Baxter Pass feeding and bedding along the edge of these footpaths. Ram groups frequently used hiking trails to traverse forest cover and move into areas of concurrent moderate to heavy human use. They concluded human and sheep were separated spatially on summer range with recreationists staying mainly on trails and around lakes and meadows. The bighorn had many other areas to frequent and so could find suitable undisturbed habitat if needed. In areas such as the main pass where sheep routinely came into contact with hikers, sheep appeared to not be adversely affected and had become conditioned to human presence. They did recommend continuance of the Zoological area restrictions on off-trail hiking and relocation of the trail away from areas intensely used by sheep.

Dunaway (1971) originally recommended the establishment of the California Bighorn Sheep Zoological Area for the Mt. Baxter and Mt. Williamson herds. Dunaway suggested disturbance by humans was the most important factor limiting populations of bighorn in the Sierra Nevada. Wehausen 1979 noted ewe-lamb groups in summer at Baxter Pass were the most disturbed by human presence, however no permanent displacement appeared to be occurring. The Mt Williamson herd however was thought to be substantially affected by human use of their summer range with a decrease in overall range of the sheep as a result. Wehausen (1979) noted that conclusions about human disturbance with one bighorn herd cannot be extrapolated to other herds because of different affectors such as benign versus threatening stimuli that have elicited different learned behaviors over generations of sheep. Confounding all of this is the lack of specific testing of human disturbance trials for herds other than Mt. Baxter and Mt. Williamson herds, and the reliance on preliminary conclusions drawn from very small numbers of observations.

In summary the last 30 years of research and monitoring concluding most recently with the Wehausen (2000) report prepared for the recovery team is that while disturbance does occur to Sierra Nevada bighorn from human presence the sheep have appeared to successfully adapt and habituate to where the effects are not considered adverse. His expert opinion is at this time no additional human restrictions are warranted in addition to the ban on dogs and goats which have already been implemented.

The Zoological Areas for Mt. Baxter and Mt. Williamson will continue to have 2 seasonal restrictions; a no hiker entry from June 1 through December 15 for high country above 10,000 feet on both herd ranges, and a no entry from December 15 through June 1 on winter and spring ranges. The Park Service also adopted an off-trail summer hiking prohibition in adjacent west side habitat. The Zoological Area has a trailhead quota of no more than 10 people per day for the Baxter trailhead

Recreational and commercial packstock grazing areas are not expected to overlap with areas bighorn currently forage in.

Alternative 1

Under this alternative effects will be similar except that less acreage of suitable bighorn habitat will be in recreation category 1 which may increase the potential for human disturbance of bighorns in Upper Tamarack and Upper little Lakes and Bloody Canyon. Out of 79,932 acres of bighorn habitat within the John Muir and Ansel Adams Wilderness Areas, 60,248 (75%) acres of habitat will be in Recreation Use Category 1 (Low levels of use dispersed across the landscape); 18,735 acres (24%) will be in Recreation Use Category 2 (Moderate levels of use dispersed across the landscape); and 949 acres (1%) will be in Recreation Use Category 3 (Visitor Management Areas).

The potential for increased human travel into bighorn habitat is unknown since trailhead quota assignments for overnight use in a watershed do not have a direct correlation with whether hikers choose to go up into bighorn habitat or not. It does however allow for increased probability of more hikers going into bighorn habitat over Alternative 1-Modified. The probability is not expected to be measurably different from the existing situation. The alternative will maintain the existing dog/domestic goat, and seasonal off-trail hiking restrictions currently in place in suitable bighorn habitat.

Recreational and commercial packstock grazing areas are not expected to overlap with areas bighorn currently forage in.

Alternative 2

Alternative 2 may lower the probability of human use in bighorn habitat since the quota for Cottonwood Lakes and Tamarack Lakes is substantially lower than all other alternatives. Since a correlation between trailhead quotas and off-trail hiking in bighorn habitat cannot be established this alternative simply decreases the number of overnight recreationists that can access bighorn habitat on any given day from a specific trailhead. The alternative will maintain the existing dog/domestic goat, and seasonal off-trail hiking restrictions currently in place in suitable bighorn habitat.

Recreational and commercial packstock grazing areas are not expected to overlap with areas bighorn currently forage in.

Alternative 3

Under this alternative human use patterns and associated disturbance in bighorn habitat will remain the same. Monitoring by bighorn researchers has shown the existing human use patterns in bighorn habitat are not adversely affecting the sheep. The alternative will maintain the existing dog/domestic goat, and seasonal off-trail hiking restrictions currently in place in suitable bighorn habitat.

Recreational and commercial packstock grazing areas are not expected to overlap with areas bighorn currently forage in.

Alternative 4

The alternative will maintain the existing dog/domestic goat, and seasonal off-trail hiking restrictions currently in place in suitable bighorn habitat.

Cumulative Effects, all Alternatives

Anticipated cumulative effects within the planning area include the ongoing mountain lion control program to reduce mortality on Sierra Nevada bighorn sheep being implemented by the California Department of Fish and Game. Continued trapping, immobilization, radio-collaring and monitoring of sheep herds by the Department also affects sheep. The Agency is also preparing to transplant sheep from individual herds to improve the population dynamics between herds.

Monitoring

California Department of Fish and Game is continually monitoring the Sierra Nevada bighorn herds including population counts, productivity, mortality and human disturbance factors. This information is fed back to the Inyo National Forest periodically as part of the Recovery Team process.

Determination

Based on the above assessment of direct and indirect effects, it is my determination that the implementation of any of the Alternatives for the Ansel Adams, John Muir, and Dinkey Lakes Wilderness Management Plan Final Environmental Impact Statement may affect but will not likely adversely affect the Sierra Nevada bighorn sheep. There is no critical habitat designated for the species therefore the implementation of the alternative will not affect any critical habitat.

This determination is based on the following:

1. Sierra Nevada bighorn sheep appear to have become habituated to human presence within their herd ranges based on Wehausen (2000) monitoring report. He concludes additional restrictions on human use within bighorn habitat are not warranted at this time since no adverse effects are occurring. Sufficient habitat is available for sheep to maintain security distances between humans and sheep since sheep have become habituated to human presence and do not exhibit adverse responses to human presence.

2. Current human use restrictions by Forest Order in the Mt. Baxter and Mt. Williamson herds within the California Bighorn Sheep Zoological Area will remain in place until the Recovery Team recommends some other management strategy.

3. Implementation of any of the alternatives will not change human use patterns within the ranges of the Mt. Langley, Wheeler Ridge and Mt. Dana herds substantially since a direct correlation between trailhead quotas, or lack of for overnight hikers ultimately entering bighorn habitat can not be established. It may be hypothesized that the limitation of overnight hikers at a trailhead accessing bighorn habitat will decrease the probability of hikers entering bighorn habitat.

4. The Inyo NF has implemented a prohibition on dogs and domestic goats within all occupied bighorn habitat.

5. A recovery plan for the Sierra bighorn sheep is currently being prepared. All recommendations will be implemented upon finalization of the Plan concurrently with re-initiation of consultation with FWS.

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BIOLOGICAL EVALUATION
(Attachment to the Biological Assessment)

U. S. FISH AND WILDLIFE SERVICE PETITIONED SPECIES

I. INTRODUCTION

The purpose of this biological evaluation is to document the effects of the proposed wilderness area management plan on Region 5 Forest Service Sensitive species that are currently under review by the U.S. Fish and Wildlife Service (FWS) for listing as Threatened or Endangered. This biological evaluation is prepared in compliance with the requirements of Forest Service Manual (FSM) direction 2670 .

The Forest Service is directed by FSM 2672.4 to complete a biological evaluation for all Forest Service planned, funded, executed, or permitted programs and activities for possible effects on endangered, threatened, proposed, or sensitive species. Sensitive species are listed by the Regional Forester of the Pacific Southwest Region (FSM 2672, Region 5 Supplement 2600-92-3), and are analyzed in this document. Endangered, threatened, and proposed species are listed by the USDI Fish and Wildlife Service (FWS) according to the Endangered Species Act (ESA), and are analyzed in an accompanying Biological Assessment document (BA).

Forest Service, Region 5 Sensitive wildlife species under review by the FWS that are known to occur within the wilderness areas, or for which suitable habitat possibly occurs, are the following.

1. **Mountain Yellow-legged Frog** (*Rana muscosa*), petitioned for listing;
2. **Yosemite Toad** (*Bufo canorus*), petitioned for listing;
3. **California Spotted Owl** (*Strix occidentalis occidentalis*), petitioned for listing;
4. **Pacific Fisher** (*Martes pennanti*);

II. SPECIES AND HABITAT ACCOUNTS

1. Mountain yellow-legged frog

Distribution

The mountain yellow-legged frog (*Rana muscosa*, sensu Zweifel 1955) is native to the Sierra Nevada and the Transverse Mountain Ranges of southern California. As of this writing it is currently under review by the U. S. Fish and Wildlife Service to determine if it should be proposed for federal listing as Threatened or Endangered.

Mountain yellow-legged frog (MYLF) populations in the Sierra Nevada were historically restricted from near La Porte in Plumas County, south to Taylor and French Joe Meadows in Tulare County, with disjunct populations to the north of the Feather River in Butte County, and single location on Breckenridge Mountain in Kern County (Jennings and Hayes 1994). The known elevational range was from around 1,370 meters at San Antonio Creek in Calaveras County, to over 3,650 meters at Desolation Lake in Fresno County (Zweifel 1955, Mullally and Cunningham 1956). Most recent survey activities for MYLF have been led by research scientists (Bradford et al 1993, Drost and Fellers 1994, Knapp and Matthews 2000) in the localities of Yosemite National Park, Sequoia-Kings Canyon National Park, and basins within and near the planning area immediately adjacent to these these two parks. Available data suggests that the distribution of healthy MYLF populations is primarily relegated to these heavily surveyed areas of the central Sierra Nevada. Recently, the standard for MYLF surveys adopted by the interagency MYLF conservation strategy team entails intensive basin-wide visits to all water bodies employing the methodology of Fellers and Freel (1995). The intent is to be able to be able to describe the status of all MYLF (to the best possible human standard) within a discrete watershed scale at a point in time for the purpose of consistent tracking of population trend.

Disjunct populations occur to the north of the Feather River in Butte County, in the Dry Creek and Dexter Creek drainages of the Glass Mountains east of Yosemite, and a single location on Breckenridge Mountain in Kern County (Jennings and Hayes 1994). These disjunct populations are all outside of the planning area.

Within the Sierra National Forest, populations of this species are known to occur within all three wilderness areas. Since 1989 about 15% of the Sierra National Forest portions of the wildernesses have had species inventories conducted. Thee surveys identified the species and life stage found (usually either tadpole or adult). Thirty one locations were identified with frogs at lakes, meadows or stream sections (Eddinger, pers. comm., 2001). Another 35 sites were surveyed with no frogs observed. One population was found at 6,500 feet, five miles west of the John Muir Wilderness. This population is likely the southern-most occurrence of the species on the Sierra NF and is being monitored year-round. As described above, populations within the three wildernesses are the focus of extensive research by Dr. Roland Knapp, Dr. Kathleen Matthews, Karen Pope, M.S., and others.

On the Inyo National Forest, considerably less than half of the project area has been surveyed for MYLF, and those surveys made have generally been less intensive than those of researchers who visit all water bodies within a basin. Since 1990, surveys by CDFG for MYLF in the Big Pine, Convict, McGee, and Hilton Creek basins can be described as complete. Populations appear to be good in the Big Pine basin, in steep decline in the Convict basin, and extirpated in the Hilton and McGee Creek basins.

During this same period, inventories in the Rock, Pine, Horton, Bishop, and Baker Creek basins are considered to be partially complete. Information compiled from these surveys indicate that populations in the Baker Creek basin are considered to be good, however extirpations appear to have occurred in the headwater lakes of the Rock Creek basin and in the Wonder Lakes of the Bishop drainage. MYLF populations in the Pine Creek basin are good in the Gable Lakes sub-watershed, but declining or extirpated from Chalfant Lake and springs located downstream outside the planning area.

All basins within the planning area north of the Convict basin and south of the Big Pine basin are basically void of MYLF surveys except for isolated observation compiled by Forest Service personnel (Parker 1994) and a contract inventory (IRT 1996). During the 1990's, Inyo National Forest records of isolated observations include only one siting of MYLF in the project area (a lake in the Independence Creek drainage), in addition to three populations observed north of the planning area in the vicinity of the Harvey Monroe Research Natural Area.

Life History

The mountain yellow-legged frog is a moderate-sized (ca. 40-80 mm snout-vent length) frog of the family Ranidae (true frogs; Jennings 1987) and although historically considered part of the *Rana boylii* group based on morphological (Zweifel 1955) and allozyme data (Case 1978, Green 1986), recent genetic work suggests that it is much more closely related to red-legged frogs (*R. aurora*) and Cascade frogs (*R. cascadae*), than foothill yellow-legged frogs (*R. boylii*) (Macey *et al.* 2001].

Recent mitrochodrial DNA work indicates that frog populations in southern California are significantly different from frog populations in the Sierra Nevada (Macey *et al.* 2001). Further, frog populations in the Sierra Nevada fall into three distinct groups, with the southern group (largely in Fresno County) being more closely allied with frogs in southern California than with frogs in the northern Sierra Nevada. Such work supports earlier morphological and allozyme data that there is a considerable amount of genetic variation in these taxa of frogs. Efforts are currently being conducted to determine the extent of differentiation of frogs in the Sierra Nevada and if they should be considered three separate species (with the southern one named *R. sierrae*) or three distinct subspecies (V. Vredenburg, pers. comm.).

Mountain yellow-legged frogs live in high mountain lakes, ponds, tarns, and streams--largely in areas that were glaciated as recently as 10,000 years ago (Zweifel 1955). Adults are typically found sitting on rocks along the shoreline, usually where there is little or no vegetation (Wright and Wright 1933). Streams utilized by adults vary from rock, high gradient streams with numerous pools, rapids, and small waterfalls, to those with marshy edges and sod banks (Zweifel 1955). Deep water (>2.5 meters) ponds are extensively utilized that have open shorelines and lack introduced fishes (Matthews and Pope 1999, Knapp and Matthews 2000). Aquatic substrates vary from bedrock to fine sand, rubble, and boulders (Zweifel 1955). Anecdotal observations indicate that this frog seems to prefer streams of low gradient and slow or moderate flow, possibly due to flood effects (Storer 1925, Stebbins 1954, Heller 1960). They seem to be absent from the smallest creeks probably because these have insufficient depth for adequate refuge and overwintering (Jennings and Hayes 1994). Both larvae and adults prefer open shorelines that gently slope up to shallow waters of only 5-8 centimeters deep (Mullally and Cunningham 1956). Shallows are used by larvae to absorb heat (to maximize digestion and growth rates) and are also used by adults as oviposition sites (Bradford 1983, Jennings and Hayes 1994). Additionally, shallows probably provide a refuge from predation if fishes occur in adjacent deeper water (Jennings and Hayes 1994). Both adults and tadpoles have been found to overwinter (up to 9 months) in the bottoms of lakes (at least 1.7 meters deep and preferably at least 2.5 meters deep, or in rocky streams (Bradford 1983, Vredenburg *et al.*, in press). In some instances, frogs have been found to overwinter in bedrock crevices (Matthews and Pope 1999) which allow them to survive in shallower water bodies that freeze to the bottom in winter (Pope 1999a). This activity may also be in response to the presence of introduced fishes which cannot survive in ponds that completely freeze (Vredenburg *et al.*, in press).

Adults breed in the shallows of ponds or in inlet streams and are often seen on wet substrates within 1 meter of the water's edge (Zweifel 1955). They are sometimes found sitting upon the edge of ice sheets as the ice melts (Bradford 1984). Some of the highest densities of frogs observed have been found at both creek junctions with irregular banks and a variety of water depths, and at open areas on the edges of glaciated lakes (Mullally and Cunningham 1956). Mountain yellow-legged frog populations seem to be most successful where predatory fish are absent (Bradford 1989; Bradford *et al.* 1993, 1994a; Knapp 1996; Pope 1999a; Knapp and Matthews 2000).

Mountain yellow-legged frogs are a diurnal species that emerges from overwintering sites immediately following snowmelt (Pope 1999a; Vredenburg *et al.*, in press; D. Bradford, pers. comm.). Like Yosemite toads (*Bufo canorus*), adults sometimes travel over snow to reach preferred breeding sites early in the season (Pope 1999a; Vredenburg *et al.*, in press). 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 1954, Zweifel 1955). The timing of the onset of breeding is dependent on the amount of snowfall and subsequent ice-out dates of ponds, lakes, and streams (Vredenburg *et al.*, in press). In years with particularly cold winters, high elevation populations of frogs may only be active for approximately 90 days during the warmest part of the summer (Bradford 1983; Vredenburg *et al.*, in press). Oviposition typically occurs in the shallow water of ponds or fast flowing inlet streams with clustering of egg masses occurring frequently (Zweifel 1955; Pope 1999a; V. Vredenburg, pers. comm.). The egg masses are normally attached to rocks, gravel, under banks, or to vegetation (Wright and Wright 1949, Stebbins 1954, Pope 1999a), but may not be attached in some pond situations (Zweifel 1955). Clutch size varies from as little as 15 to 350 eggs per egg mass (Livezey and Wright 1945; Vredenburg *et al.*, in press). In laboratory breeding experiments, egg hatching times ranged from 18-21 days at temperatures ranging from 5-13.5°C (Zweifel 1955). Field observations are similar (Pope 1999a).

Larvae maintain a relatively high body temperature by selecting warmer microhabitats (Bradford 1984). Before spring overturn, larvae remain in warmer water below the thermocline; after spring overturn, they move to warm shallows on a daily basis, taking advantage of daily changes in water temperatures. Larvae may form diurnal aggregations in shallow water that may number in the hundreds, and voluntarily elevate their body temperatures to as high as 27°C (Bradford 1984). Despite such behavior, larvae apparently must overwinter at least two times for 6-9 month intervals (Cory 1962, Bradford 1983) before attaining metamorphosis because the active season is short and the aquatic habitat maintains warm temperatures for only brief intervals (Mullally and Cunningham 1956). In closely related southern California frogs, overwintering results in larvae dying when the aquatic habitat becomes ephemeral in some years (Mullally 1959). Larvae have the ability to survive anoxic conditions when shallow lakes freeze to the bottom for months (Bradford 1983, Pope 1999a, Matthews and Pope 1999). The time required to develop from fertilization to metamorphosis is believed to vary between 1 and 3.5 years (Storer 1925; Wright and Wright 1933; Zweifel 1955; Vredenburg *et al.*, in press). The time required to reach reproductive maturity is thought to vary between 3 and 4 years after metamorphosis (Zweifel 1955).

Data on the longevity of adults is unknown, but adult survivorship from year to year is very high, so they are undoubtedly long-lived amphibians (Pope 1999a, Matthews and Pope 1999). During the active season, postmetamorphic frogs tend to maximize body temperatures at nearly all times of the day by basking in the sun, moving between water and land (depending on which is warmer), and concentrating in the warmer shallows along the shoreline (Bradford 1984, Pope 1999a, Matthews and Pope 1999). Postmetamorphs appear to be susceptible to winterkill in shallow lakes that undergo oxygen depletion because they are less tolerant of low oxygen tension than larvae (Bradford 1983). As the temperatures drop to freezing or below (generally October to November), frogs become inactive for the winter (Zweifel 1955, Bradford 1983, Pope 1999a, Matthews and Pope 1999). They apparently spend the winter at the bottom of lakes, in rocky streams, or in bedrock crevices (Vredenburg *et al.*, in press; Pope 1999a; Matthews and Pope 1999). Although data are currently limited, there is evidence that mountain yellow-legged frogs display a strong site fidelity and return to the same over-wintering and summer habitats from year to year (Pope 1999a).

Closely related mountain yellow-legged frogs in southern California are reported to prey on a wide variety of invertebrates including beetles (Coleoptera), ants (Formicidae), bees (Apoidea), wasps (Hymenoptera), flies (Diptera), true-bugs (Hemiptera), and dragonflies (Odonata) (Long 1970). Larger frogs take more aquatic true bugs probably because of their more aquatic behavior (Jennings and Hayes 1994). Adult frogs have been observed eating Yosemite toad larvae (Mullally 1953) and Pacific treefrog (*Hyla regilla*) larvae (Pope 1999b). There is one observation of mountain yellow-legged frog larvae cannibalizing thousands of conspecific eggs (Vredenburg *et al.*, in press). In addition, the larvae have been seen feeding on the carcasses of dead metamorphosed frogs (Vredenburg *et al.*, in press).

Known predators of mountain yellow-legged frogs include the western terrestrial garter snake (*Thamnophis elegans*) [Grinnell and Storer 1924; Mullally and Cunningham 1956; Jennings *et al.* 1992; Matthews *et al.*, in review], Brewer's blackbirds (*Euphagus cyanocephalus*) (Bradford 1991), Clark's nutcrackers (*Nucifraga columbiana*) (Camp 1917), and coyotes (*Canis latrans*) (Moore 1929). There are apparently two anecdotal reports of black bear (*Ursus americanus*) feeding on this frog (Vredenburg *et al.*, in press). Garter snakes apparently depend extensively on this frog as a food supply and were commonly found near large number of amphibian tadpoles (Jennings *et al.*, 1992). Introduced rainbow trout (*Oncorhynchus mykiss*), golden trout (*O. aguabonita*), brook charr (*Salvelinus fontinalis*) and brown trout (*Salmo trutta*) have been observed to prey on all life stages of mountain yellow-legged frogs (Grinnell and Storer 1924, Needham and Vestall 1938, Knapp 1996) as well as all life stages of garter snakes (Jennings, unpubl. data).

Mountain yellow-legged frog adults typically move only a few hundred meters (Pope 1999a, Matthews and Pope 1999), but distances of up to 1 kilometer have been observed (Vredenburg *et al.*, in press). Adults tend to move between selected breeding, feeding, and overwintering habitats during the course of the year (Pope 1999a). There are almost no data on the dispersal of juvenile mountain yellow-legged frogs away from breeding sites (Bradford 1991). However, juveniles have been observed in small intermittent streams and may be dispersing to permanent water (Bradford 1991). Although it has been reported that frogs avoid crossing even short distances of dry ground (Mullally and Cunningham 1956), frogs have recently been documented moving overland as much as 66 meters, 142 meters, and 400 meters away from water (Matthews and Pope 1999; Vredenburg *et al.*, in press). Adults seem to be able to cross large patches of snow without ill effect (Pope 1999a).

Frogs are also susceptible to mortality from diseases. Bradford (1991) observed a large scale die off of mountain yellow-legged frogs from red-legged disease caused by the bacterium (*Aeromonas hydrophila*). Recently, a *Chytrid* fungus has been found infecting tadpoles and subadults (G. Fellers, R. Knapp, K. Matthews, and K. Pope, pers. comm.). Although the distribution and life history of *Chytrid* fungi in North America has received little relatively little study. *Chytrid* fungi are known to be distributed in water bodies throughout the Sierra Nevada (G. Fellers, pers. comm.). In many cases, *Chytrid* populations exist sympatrically with MYLF with no evidence of die-offs in the frog population. The mechanism(s) of transport and infection by the *Chytrid* fungus to MYLF and its habitat is not clearly understood at this time. This fungus disrupts the formation of chitinous body parts during larval growth and can lead to mortality. The biology of *Chytrid* fungi in the Sierra Nevada as it relates to MYLF should be treated as an important focus of research relative to the protection and restoration of populations and the species as a whole.

The widespread introduction of trout into previously fishless lakes has had a major negative effect on the overall survival of mountain yellow-legged frog populations in the Sierra Nevada (Knapp and Matthews 2000). It is considered to be the primary factor in the decline of mountain yellow-legged frogs.

2. Yosemite toad

The Yosemite toad is a high country toad, endemic to the Sierra Nevada Mountains from Ebbetts Pass, Alpine County in the north, to south of Kaiser Pass and Evolution Lake at, Fresno County the southern end of its range (Karlstrom 1962, Stebbins 1985). As of this writing it is currently under review by the U. S. Fish and Wildlife Service to determine if it should be proposed for listing as Threatened or Endangered. The reported range of occurrence in the Sierra encompasses about 144 miles north to south, by 30 miles east to west . The species is found throughout the Ansel Adams, John Muir and Dinkey Lakes Wildernesses. On the east side of the Sierra Nevada, populations have not been found any further south than the North Fork of Bishop Creek west of the town of Bishop. The west side Sierra NF populations have been found as far south as Spanish Lake in the John Muir Wilderness near the border with the Monarch Wilderness, and as far north as Stairway Meadow in the Ansel Adams Wilderness. A breeding population also occurs one mile west of the John Muir boundary within the Kaiser Wilderness at about 9,200 feet (H. Eddinger, pers. comm., 2001)

The literature reports the species as occuring in open montane meadows near lodgepole pine forests between 6,400 to 11,300 feet elevation, with the majority of sites between 8,500 and 10,000 feet (Karlstrom 1962; Sherman 1980). On the Inyo National Forest breeding populations have been found from 8,823 feet in elevation in the lodgepole pine zone, into the whitebark pine, and alpine habitat associations to 11,300 feet.(USFS various dates). Intensive surveys on the Inyo have identified 30 discrete meadow locations in 10 creek drainages where Yosemite toads have been discovered breeding (ibid.). From this survey and the remaining unsurveyed area it is estimated that 75 to 80 percent of the breeding locations have been identified for the Inyo. There are eleven known breeding sites in the planning area where they overlap areas of high human use, or travel ways where toads are being affected to some degree, or can be potentially affected.

The Sierra National Forest has surveyed approximately 15% of its portion of the John Muir, Ansel Adams and Dinkey Lakes wildernesses. The surveys have identified tadpole or adults present at approximately 47 lakes, meadows, or streams. Thirty five other sites (30% of all area surveyed) had no toads present. No studies have been conducted to assess impacts of recreation use on Yosemite toad populations, or habitat on the Sierra NF.

No reliable data is available on population size or status for either Forest. A 1916 survey of Yosemite National Park noted the toad was once abundant at many locations (Pacrivers 2000). The full extent of the historical population and abundance has not been systematically documented other than such anecdotes. Surveys conducted over the last 30 years have detected decreasing numbers of toads at their breeding sites, as well as historical breeding areas that have become unoccupied (ibid.). A 1990 survey found an average of only 6 toads per site compared to an average estimated historical density of 100 individuals per site (ibid.). The report did not say how the 100 animal estimate was derived or when toads per site were actually counted.

The most studied population from which most of the research literature has been reported is at Tioga Pass at the north end of the Ansel Adams Wilderness (Karlstrom 1962, Sherman

1980, Sherman and Morton 1993). Toads were numerous in the hundreds at the meadow until the late 70's when the population crashed from a reported combination of drought, and red-legged disease (Sherman and Morton 1993). The authors suggested their intensive research techniques may have spread the disease, and enhanced the susceptibility of the toads to infection as possibly contributing to the population decline. Since then the population has continued to decline to where in 2000 only one breeding male was observed in the meadow (Forest Service 2000).

The petition to list the species notes numerous personal communications of toad surveys with disappearances of toads or very low numbers of individuals observed from historical sites resurveyed through the 1990's. A number of the reports are personal communications or surveys that are not available through the literature but rather unpublished locally prepared reports (Pacrivers 2000). The best citation notes a survey in Yosemite National Park where only 50% of resurveyed locations from the original 1916 survey were found to have toads present in 1994 (Drost and Fellers 1996). Sherman and Morton 1993 lend additional credibility to population declines from surveys north of Tioga Pass on the Inyo National Forest were numbers of breeding toads have declined. A comprehensive analysis of the toads status rangewide is lacking since the survey information is localized and repeat visits have been few to evaluate survey bias due to weather or yearly variations. Surveys on the Inyo have shown the toads to be present at all historical locations checked so far, with new breeding areas located as well, however numbers of adult individuals observed are generally between 1 and 10, and breeding success appears to be marginal (Forest Service various dates). The most easily observed impact on successful egg hatching and tadpole survival has been premature drying of the ephemeral pools. This habitat variable differentially impacts each breeding area to the degree the pools remain flooded until the tadpoles can metamorphose and become terrestrial. In some years especially during drought, pool drying results in mortality of partial to complete egg and tadpole production of the year.

Yosemite toads hibernate from late September or early October, and emerge in the Spring (April-July) after six to eight months depending on elevation and weather. The toads utilize rodent burrows, crevices under rocks, or the base of willows for hibernation (Sherman 1980). Males emerge from hibernation for breeding as soon as snow melts from meadows (Sherman 1980; Martin 1992). Females first breed at 4-6 years and males at 3-5 years of age (Sherman 1980). It is estimated that some females may live at least 15 years and males at least 12 years (Sherman and Morton 1984).

Yosemite toads breed in shallow vernal, ephemeral pools and small, slow moving, shallow streams usually in moist and wet meadows (Martin 1992). The majority of breeding takes place from May through June depending on elevation and annual weather variation (Sherman 1980; Martin 1992). Both sexes are primarily active during the day (Sherman 1980; Martin 1992; Sherman and Morton 1984). There may be ten times as many males as females at a breeding site (Karlstrom 1962; Sherman 1980). Males call diurnally from shallow flooded sites in the meadows to attract the female and can be heard from more than 100 yards (Sherman 1980; Martin 1992). Eggs are laid in single or double strands, typically in pools or streams not more than three inches deep with a loose silt substrate (Martin 1992). A single female lays an estimated 1,500 to 2,000 eggs (Martin 1992). Karlstrom (1962) estimates critical thermal maximum of 36-38^{o} C for larvae and 31^{o} C as upper limiting temperature for egg development. Eggs hatched in about 10-12 days, and tadpoles metamorphose seven to nine weeks after the eggs are laid (Sherman 1980; Sherman and Morton 1984). Tadpoles remain by day in the shallowest margins of the vernal pools and spring channels in some cases indistinguishable from the wet flooded portions of the meadow itself. The metamorphosed toads are approximately ½ inch in size when they emerged from the pools to become terrestrial animals (Milano personal observations 2000). They will spend the remainder of the summer foraging in the pool mudflats, spring fed channels and portions of the meadow (ibid.). Egg masses, tadpoles and small toadlets are highly vulnerable to trampling from wilderness users including hikers, dogs and pack animals throughout the summer (ibid.). It is common to find juveniles and adult toads on hiker and packstock trails where trails pass through or come close to breeding pools (ibid.).

Individual adult males only stay at breeding areas for a week or two, and females only for only a few days (Sherman 1980; Sherman and Morton 1984). After breeding both sexes move into meadow areas to feed for two to three months before hibernating (Sherman 1980; Sherman and Morton 1984). The Yosemite toad stays in a relatively small area and is generally only active during the day (Martin 1992). Yosemite toads have seldom been found more than a hundred yards from permanent water, although they spend little time actually in water. When not active, Yosemite toads take cover in rodent burrows, under surface objects and in willow thickets. Sherman (1980) found toads traveled 150-230 meters between hibernation areas and breeding areas. First year juveniles hibernate near the pools from which they emerged (Sherman 1980).

Livestock hoof impacts may have the potential to collapse burrows Yosemite toads enter for cover or hibernation. This question remains uninvestigated.

The most significant natural factor affecting Yosemite toad production and population viability is climate. Predation and disease also play a role and in some cases can contribute to localized extirpation or population reduction for some period of time. How and if toads recolonize an area after these events remains unknown. Dispersal from one population area to another remains ripe for investigation. There are significant mountain barriers between many of these breeding areas and how and if toads can move across these is unknown. Anthropogenic factors include trampling of all life stages, modification of breeding pool structure from foot imprints, and collection of the species for bait or amusement. Handling of the toad by humans has been suggested to cause stress in the animal that could predispose it to disease. Livestock grazing can result in trampling of the species, a reduction in vegetative cover that may make toads and tadpoles more vulnerable to predation, hoof punching of pools that can result in entrapment of tadpoles and toadlets, and collapse of rodent burrows that may harbor toads. Most recently organophosphorous pesticide drift and deposition into the Sierra from agricultural areas of California such as the San Joaquin area have been correlated with concentrations of pestcides found in amphibians including the Yosemite toad (USGS 2001). Scientists believe this may be an important factor in the decline of Sierra amphibians.

3. California spotted owl

Suitable California spotted owl (*Stryx occidentalis occidentalis*) nesting habitat contains greater than 70 percent canopy closure and suitable west-side foraging habitat contains greater than 50 percent canopy closure. The CASPO classification for nesting habitat is "select" strata, and foraging habitat is classified as "other" strata. Characteristics defined for both nesting and foraging habitat are also described as "half of the canopy made up of dominant, overstory trees and the rest made up of trees 30' or taller... preference is shown for stands with two or more layers, but open enough to allow for observations and flying space to attack prey. Large trees with sufficient branching for perches and nesting are preferable. Substantial amounts of dead woody debris, both standing and dead and down, are desirable" (USFS 1993). Suitable spotted owl habitats (conifer only) have been delineated for the forests and are based on satellite imagery. Spotted owls in conifer forests of the Sierra Nevada above 4,000 feet in elevation, prey mainly on northern flying squirrels (Glaucomys sabrinus). Northern flying squirrels compromise as much as sixty percent of the total prey eaten in some locations. The abundance of large downed logs has been associated with the abundance of hypogeous fungi, a major food source of flying squirrels (Verner, et al. 1992). Owls in mid-to-lower elevations of the mixed-conifer zone and the upper part of the ponderosa pine/hardwood zone prey heavily on both flying squirrels and dusky-footed woodrats (Neotoma fuscipes). Spotted owls in the Sierran foothill riparian/hardwood forests prey almost entirely on woodrats. Spotted owl habitat (select and other strata, PAC's, and SOHA's) is managed to CASPO Guidelines.

Within the Sierran Province (Sierra Nevada Mountains and foothills) there are about 1,637 spotted owl sites (pairs and territorial single owls) on federal and non-federal land (USFS 1995). California spotted owl nest or roost sites are mainly located in mixed conifer forests (80 percent), and to a lesser extent in red fir (10 percent), and ponderosa pine/hardwoods (7 percent) (USFS 1993). Typically, mixed conifer stands on the Sierra National Forest are common to elevations under 7,500 ft. Red fir stands and associations are common to areas above 7,000 ft. California spotted owls do not commonly frequent areas above 8,500 feet. Most nesting activities in the Sierra National Forest are below 7,500 ft. A few spotted owls also nest in low elevation, foothill riparian areas with hardwoods. Some California spotted owls undergo an altitudinal migration and may winter at lower elevations.

A total of 18 spotted owl Protected Activity Centers (PACs) and Spotted Owl Habitat Areas (SOHAs) are located west of the Sierra Crest within the planning area. The majority of these have not been surveyed since 1992. Spotted owls generally do not occupy habitats above 8,500’ and usually nest below 7,500’. Habitat within the planning area is limited by elevation and vegetation type. The Inyo NF has some suitable habitat on the Mono Lake and Mammoth districts, but surveys in 1994 and 1995 did not locate any owls. There have been historical sightings on the Inyo NF. Like the goshawk, spotted owl habitat within the wilderness has not been altered or managed by humans, so the condition is probably fairly close to the natural range of variability. Spotted owls are quite tolerant of human presence, so recreational activities in proximity to owls are a lesser concern than they are with goshawks.

As summarized in the CASPO environmental assessment from the CASPO report, some general statements regarding habitat can be made:

1) Habitat attributes for nest and roost stands confirm that most California spotted owls select dense stands with very large, old trees for nesting and roosting.

2) California spotted owls use a broader array of habitat than used by Northern spotted owls for foraging, but in spite of this variation, use a considerably narrower range of habitats than is generally available to them.

3) California spotted owls in the Sierra Nevada appear to select remnants of the older conifer forests that have survived 200 to 400 years, for nest and roost locations. Within the habitat types selected, they use forest patches that are complex in structure relative to what is available (many trees in different diameter classes, high tree-species diversity, high canopy closure).

The breeding cycle of the spotted owl extends from about mid-February to mid-to-late September, when the young are no longer regularly cared for by their parents. The laying stage through the incubation stage, when the female spotted owl must remain on the nest, extends from early April through mid-May. Young typically fledge from the nest in mid-to-late June. For the first several 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 (USFS 1995).

The Forest has established 157 PACs and 29 SOHA's. Spotted owl sites are based on historical information, and recent surveys (1989-1993), most to established Regional survey protocols. Currently on the Forest there is an ongoing demographic study on the Kings River Ranger District by the Pacific Southwest Research Station (PSW). Demographic studies were initiated in March of 1990. Information collected will allow comparisons between spotted owl demographics in a managed National Forest and protected forests of the National Park (Sequoia and Kings Canyon). In 1994 an additional study area was initiated in the Sierra National Forest to provide complete coverage of the Kings River Ecological Management Area.

4. Pacific Fisher

Multi-storied, multi-species late seral stage coniferous forests characterize habitat for fishers. Low quality habitat has 40-60 percent canopy closure (cc), moderate quality habitat has 61-80% cc, and high quality habitat has more than 80% cc. The latter two have a high number of snags (>30" dbh and >2 per ac) and down logs per acre (Freel 1992). Fisher often occur at elevations ranging from 4,000 to 8,000 feet. Snags and logs are an important component of marten and fisher habitat. Den sites are often found in snags and logs. Hypogenous fungi associated with the abundance of downed logs provide a food source for squirrels and other small mammals that marten and fisher prey upon. Douglas squirrels (*Tamiasciurus douglasi*) are an important prey species for marten. Conifer seeds and fungi are the primary food source of these squirrels. In the winter, logs provide martens with access to subnivean (under snow) areas for foraging and resting (Ruggiero, et al. 1994). Selection of den sites may depend on ambient air temperatures. Subnivean (below the snow surface) sites and logs used as winter dens may reduce thermo-regulatory stress. Occasional one or two lane forest roads with moderate levels of traffic should not limit fisher or marten movements (Ruggiero, et al. 1994).

There are 14 records of fisher occurrence on the Inyo NF, none overlapping spatially with areas currently grazed by livestock. Seven additional sightings (or sign) are recorded from adjacent administrative units including Sequoia/Kings Canyon National Park and Toiyabe and Sequoia NF’s. These sightings date from 1949 to 1989.

On the Inyo NF, no surveys have been conducted specifically for fisher, however surveys performed for wolverine and marten would apply. No fishers were detected during these survey efforts.

On the Sierra NF, only one historical sighting of fisher exists within the wilderness. Fisher are more commonly found at elevations lower than 8,000 feet. Suitable habitat for fisher within the wilderness west of the Sierra Crest is probably limited. They are found in the Sierra outside of wilderness areas, where recent surveys have found fisher on both the north and south side of the San Joaquin River. Where suitable habitat exists within the wilderness, conditions there should be suitable as humans have not managed these stands and the presence of humans is lower overall.

III. EFFECTS OF THE PROPOSED PROJECT

1. Mountain Yellow-legged Frog (MYLF):

Direct and Indirect Effects

Possible direct and indirect effects to MYLF include: predation and competition by introduced non-native fish, airborne contaminants, pesticide applications, increased UV-B radiation, acid deposition, climate change, grazing and trampling by commercial and recreational stock, native and non-native diseases affecting MYLF, direct management of MYLF, and research activities. Although the Forest Service participates in the decision making process of stocking of fish in its wilderness areas, this project proposes no actions involving the introduction of native or non-native fish within the planning area. Such actions are the responsibility of the State of California Department of Fish and Game (CDFG) and are not analyzed as part of this project. Similarly, other management activities by CDFG related to monitoring, protecting, and restoring MYLF populations within wilderness areas are the responsibility of the Department. Research activities within wilderness areas by scientists not associated with CDFG or the Forest Service require a research permit, however this permitting process is not part of the proposed action of this project and will not be assessed in this analysis. This project does not propose production grazing activities nor pesticide applications. Capable and suitable production grazing allotments that occur within the planning area are or will be subject to site-specific environmental analysis. Similarly, proposals to apply pesticides within the planning area would be subject to site-specific environmental analysis and Forest Service regulations for resource management within wilderness.

Direct impacts of humans upon MYLF (i.e., trampling mortality, unauthorized collections, etc.) are rarely if ever documented by observation (C. Milliron, pers. comm.; R. Knapp, pers. comm.) or in the scientific literature. However, such events are possible within the planning area at a level insignificant to the viability of the species. The indirect impacts of humans upon MYLF (i.e., habitat trampling) is similarly not well understood or documented. The level of direct and indirect human impacts, however insignificant, is directly proportional to the level of use authorized under the trailhead quota by alternative.

The indirect impacts of disease transfer to MYLF could also be interpreted as human-related. It has been speculated that potential exists for the transport of pathogens via stock, fishing equipment, etc., and that the conservative approach to the protection of MYLF from microbial pathogens (e.g., *Aeromonas* bacterium and the *Chytrid* fungus) should require some level of restrictions of human and stock use in the vicinity of MYLF habitat. However, the life history patterns and means of transfer of live pathogens between water bodies and/or MYLF populations is very poorly understood (G. Fellers, pers. comm.). In addition, the known distribution of disease pathogens of MYLF within the planning area is sparse and in need of inventory. It has been noted (G. Fellers pers. comm.) that the *Chytrid* fungus and MYLF are widely distributed sympatrically in the Sierra Nevada without evidence of frog die-off, recommendations for curtailment of human use in the vicinity of frog habitat are likely premature. As such, Fellers cautions that the best approach to protecting MYLF from these diseases requires a more complete understanding of the mechanism(s) of infection and/or transport of each pathogen. Implementation, monitoring, and enforcement of Best Management Practices (BMP's) 4-10, 4-11, 5-4, 7-3, 7-5, 7-7, 8-2, and 8-3 (adopted regionally since 1979) by all alternatives should continue to provide protection to water quality and habitat condition for MYLF.

The impacts of campsite location and recreational grazing use may be interpreted as human-related, but are evaluated separately by alternative-specific standards and guidelines. The direct and indirect effects of stock upon MYLF include a limited set of important observations and studies. As an example, stock trampling mortality of adult, toadlet, and larval stages of Yosemite toads (YT) has been observed in terrestrial, wetland, and shallow lentic habitats where these life stages of the toad are most commonly observed. As adult and larval MYLF generally prefer deeper water habitats, the probability of direct mortality by stock trampling is considerably lower than for YT, yet still a possible threat. In addition, direct mortality of egg masses may occur in shallow streams or ponds where trampling occurs. In the Sixty Lakes Basin of Kings Canyon National Park, concern for sensitive springs and spring brooks where MYLF egg laying is concentrated was described by V. Vredenberg (pers. comm.), who observed unrestricted packstock use (two mules for two days) during the summer of 2000 where trampling of sensitive spring habitat occurred and was not recovered by the end of the season. This trampling narrowly missed MYLF egg masses. Vredenberg hypothesized that MYLF, which typically use deep pond and lake habitat, are forced to use limited spring habitat as egg-laying sites as the result of habitat fragmentation/segregation by trout introduced into the historically secure habitats of nearby deep lakes and ponds. Given the indirect impact of habitat degradation and the importance of limited egg-laying habitat for MYLF, the Park Service signed a memorandum restricting stock to day use in the Sixty Lakes Basin. Studies by K. Matthews and K. Pope (pers. comm.) describe streamside and lakeside habitat preference of MYLF for willow during the month of August, which implies that grazing impacts to willow density and structure may have a negative impact upon MYLF. The potential of water quality impacts from livestock waste introduced into aquatic habitat of MYLF may reduce their resistance to bacterial and fungal diseases such as "red-legged disease" (*Aeromonas hydrophilla*) and *chytrid* fungus infection (R. Knapp, pers. comm.), and could lead to sub-lethal effects or even mortality. In summary, the risk of direct and indirect impacts of stock trampling and grazing to MYLF and their habitat could occur in the planning area under the proposed action.

Possible effects due to airborne contaminants, increased UV-B radiation, acid deposition, and climate change all are the result of non-federal actions occurring outside of the planning area and are covered under the Cumulative Effects section below.

Alternative 1- Modified : Implementation of Alternative 1-Modified entails relatively no change in recreational use quotas with minor changes in distribution of human use by trailhead. Recreational grazing standards in typical MYLF habitat (meadows and riparian areas) under Alternative 1 vary from 5-40% use by weight according to vegetation type (herbaceous and perennial; shrubs and trees) and seral state (high-seral; mid-seral). In all use types, the percent use is decreased under the proposed action by at least 25% from the previous management guidelines (Alternative 3, No Action).

The minimum campsite-to-water distance of 50 feet prescribed under the proposed action is double the previous standard. Combined with the Sierra Nevada Forest Plan Amendment standards and guides RCA-4, 14, and 40, the Alternative 1-Modified should result in slightly reduced recreational use impacts to MYLF habitat.

Concurrent implementation of the Sierra Nevada Forest Plan Amendment Standard and Guideline RCA-41 prohibits pack and saddle stock grazing in standing water, saturated soils in wet meadows, and associated springs and streams occupied by the Yosemite toad (YT). As MYLF populations and habitat entails localized overlap with that of the YT, this Standard and Guide will provide extra protection from grazing impacts to MYLF where populations and habitat of YT are concurrent. Standard and Guide RCA-18 limits disturbance to meadow streambanks and lake and pond shorelines to 20% by length, providing further mitigation to the effects of stock upon MYLF and their habitat. The implementation of Critical Aquatic Refuges within the planning area where MYLF occur, in addition to Framework standards and guidelines RCA-4, 6, 12, 14, 19, 39, 40, 41b, FW-RCA-26, and FW-RCA-28 provide additional protection, monitoring, and mitigation for MYLF. Overall, Alternative 2 should result in a slight reduction of impacts by recreational stock use to MYLF and their habitat.

In areas currently experiencing high recreational use, the increase in minimum campsite to water distance and increased grazing standards will help to slightly improve MYLF habitat quality. Currently heavily used areas will remain so, and areas lightly used or not used by humans will remain refuges for the MYLF. The changes to recreational use quotas for overall use and/or use by trailhead in Alternative 1-Modified do not present a level of direct and/or indirect human impacts upon MYLF that threaten the viability of the species.

Overall, Alternative 1-Modified will result in reduced impacts to MYLF and their habitat. The consequence of reduced impacts to MYLF as a result of the proposed action is secondary relative to primary factors limiting the conservation and restoration of MYLF such as introduced fish and airborne pesticides. As past impacts of grazing and human uses to MYLF have not been quantified, the degree to which mitigation will be effectively measured and evaluated is less than optimal. A more complete understanding of the infective mechanism and routes of infection than currently exists is needed before creating issues of human and stock contact with MYLF individuals and populations within the planning area.

Alternative 1 : Implementation of Alternative 1 entails relatively no change in recreational use quotas with minor changes in distribution of human use by trailhead. The minimum campsite-to-water distance of 50 feet prescribed under the proposed action is double the previous standard. Combined with the Sierra Nevada Forest Plan Amendment standards and guides RCA-4, 14, and 40, the Alternative 1 should result in slightly reduced recreational use impacts to the quality of MYLF habitat.

In areas currently experiencing high recreational use, the increase in minimum campsite to water distance and increased grazing standards will help to slightly improve MYLF habitat quality. Currently heavily used areas will remain so, and areas lightly used or not used by humans will remain refuges for the MYLF. The changes to recreational use quotas for overall use and/or use by trailhead in Alternative 1 do not present a level of direct and/or indirect human impacts upon MYLF that threaten the viability of the species.

Recreational grazing standards in typical MYLF habitat (meadows and riparian areas) under Alternative 1 vary from 5-40% use by weight according to vegetation type (herbaceous and perennial; shrubs and trees) and seral state (high-seral; mid-seral). In all use types, the percent use is decreased under the proposed action by at least 25% from the previous management guidelines (Alternative 3, No Action).

Concurrent implementation of the Sierra Nevada Forest Plan Amendment Standard and Guideline RCA-41 prohibits pack and saddle stock grazing in standing water, saturated soils in wet meadows, and associated springs and streams occupied by the Yosemite toad (YT). As MYLF populations and habitat entails localized overlap with that of the YT, this Standard and Guide will provide extra protection from grazing impacts to MYLF where populations and habitat of YT are concurrent. Standard and Guide RCA-18 limits disturbance to meadow streambanks and lake and pond shorelines to 20% by length, providing further mitigation to the effects of stock upon MYLF and their habitat. The implementation of Critical Aquatic Refuges within the planning area where MYLF occur, in addition to Framework standards and guidelines RCA-4, 6, 12, 14, 19, 39, 40, 41b, FW-RCA-26, and FW-RCA-28 provide additional protection, monitoring, and mitigation for MYLF. Overall, Alternative 2 should result in a slight reduction of impacts by recreational stock use to MYLF and their habitat.

Overall, Alternative 1 will result in reduced impacts to MYLF and their habitat. The consequence of reduced impacts to MYLF as a result of Alternative 1 is secondary relative to primary factors limiting the conservation and restoration of MYLF such as introduced fish and airborne pesticides. As past impacts of grazing and human uses to MYLF have not been quantified, the degree to which mitigation will be effectively measured and evaluated is less than optimal. A more complete understanding of the infective mechanism and routes of infection than currently exists is needed before creating issues of human and stock contact with MYLF individuals and populations within the planning area.

Alternative 2 : Implementation of Alternative 2 entails a considerable reduction in overall recreational use quotas, including an even distribution of use across all trailheads. In use areas with high historic recreational use, use should decrease to meet the goal of "equal use" among all areas. Conversely, in areas with low historic recreational use, use should increase to meet the goal of "equal use", resulting in a reduction in impacts to MYLF and their habitat.

The minimum campsite-to-water distance of 100 feet prescribed under the proposed action is quadurple the previous standard. Combined with the Sierra Nevada Forest Plan Amendment standards and guides RCA-4, 14, and 40, Alternative 2 should result in reduced recreational use impacts to the quality of MYLF habitat.

Recreational grazing standards in typical MYLF habitat (meadows and riparian areas) under Alternative 2 vary from 5-20% use by weight according to vegetation type (herbaceous and perennial; shrubs and trees) and seral state (high-seral; mid-seral). In all use types, the percent use is decreased under the proposed action by at least 30% from the previous management guidelines (Alternative 3, No Action).

In addition, concurrent implementation of the Sierra Nevada Forest Plan Amendment Standard and Guideline RCA-41 prohibits pack and saddle stock grazing in standing water, saturated soils in wet meadows, and associated springs and streams occupied by the Yosemite toad (YT). As MYLF populations and habitat entails localized overlap with that of the YT, this Standard and Guide will provide extra protection from grazing impacts to MYLF where populations and habitat of YT are concurrent. Standard and Guide RCA-18 limits disturbance to meadow streambanks and lake and pond shorelines to 20% by length, providing further mitigation to the effects of stock upon MYLF and their habitat. The implementation of Critical Aquatic Refuges within the planning area where MYLF occur, in addition to Framework standards and guidelines RCA-4, 6, 12, 14, 19, 39, 40, 41b, FW-RCA-26, and FW-RCA-28 provide additional protection, monitoring, and mitigation for MYLF. Overall, Alternative 2 should result in reduced impacts by recreational stock use to MYLF and their habitat.

The increase in minimum campsite to water distance and increased grazing standards will help to improve MYLF habitat quality. The changes to recreational use quotas for overall use and/or use by trailhead in Alternative 2 do not present a level of direct and/or indirect human impacts upon MYLF that threaten the viability of the species.

Overall, Alternative 2 will result in reduced impacts to MYLF and their habitat. The consequence of reduced impacts to MYLF as a result of Alternative 2 is secondary relative to primary factors limiting the conservation and restoration of MYLF such as introduced fish and airborne pesticides. As past impacts of grazing and human uses to MYLF have not been quantified, the degree to which mitigation will be effectively measured and evaluated is less than optimal. A more complete understanding of the infective mechanism and routes of infection than currently exists is needed before creating issues of human and stock contact with MYLF individuals and populations within the planning area.

Alternative 3 : Implementation of Alternative 3 entails no change in recreational use quotas or in the distribution of use at individual trailheads. In areas currently experiencing high recreational use, no changes to the quality of MYLF habitat will occur. Currently heavily used areas will remain so, and areas lightly used or not used by humans will remain refuges for the MYLF. The minimum campsite-to-water distance of 25 feet prescribed is the same as the previous standard. The trailhead quota for Alternative 3 does not present a level of direct and indirect human impacts upon MYLF that threaten the viability of the species. Combined with the Sierra Nevada Forest Plan Amendment standards and guides RCA-4, 14, and 40, Alternative 3 should result in a slight reduction in human impacts to the quality of MYLF habitat.

Recreational grazing standards in typical MYLF habitat (meadows and riparian areas) under Alternative 3 vary from 35-55% use by weight according to vegetation type (herbaceous and perennial; shrubs and trees) and seral state (high-seral; mid-seral). In all use types, the percent use is unchanged under the No Action alternative.

In addition, concurrent implementation of the Sierra Nevada Forest Plan Amendment Standard and Guideline RCA-41 prohibits pack and saddle stock grazing in standing water, saturated soils in wet meadows, and associated springs and streams occupied by the Yosemite toad (YT). As MYLF populations and habitat entails localized overlap with that of the YT, this Standard and Guide will provide extra protection from grazing impacts to MYLF where populations and habitat of YT are concurrent. Standard and Guide RCA-18 limits disturbance to meadow streambanks and lake and pond shorelines to 20% by length, providing further mitigation to the effects of stock upon MYLF and their habitat. The implementation of Critical Aquatic Refuges within the planning area where MYLF occur, in addition to Framework standards and guidelines RCA-4, 6, 12, 14, 19, 39, 40, 41b, FW-RCA-26, and FW-RCA-28 provide additional protection, monitoring, and mitigation for MYLF. Overall, Alternative 3 should result in slightly reduced impacts by recreational stock use to MYLF and their habitat.

Overall, Alternative 3 will result in slightly reduced impacts to MYLF and their habitat. The consequence of reduced impacts to MYLF as a result of Alternative 3 is secondary relative to primary factors limiting the conservation and restoration of MYLF such as introduced fish and airborne pesticides. As past impacts of grazing and human uses to MYLF have not been quantified, the degree to which mitigation will be effectively measured and evaluated is less than optimal. A more complete understanding of the infective mechanism and routes of infection than currently exists is needed before creating issues of human and stock contact with MYLF individuals and populations within the planning area.

Alternative 4 : Implementation of Alternative 4 entails no change in recreational use quotas or in the distribution of use at individual trailheads. Increased use may occur on a case-by-case basis. The prescribed campsite standard provides no direction to buffer aquatic habitats from camping areas, hence no protection for MYLF from camping impacts. When combined with the Sierra Nevada Forest Plan Amendment standards and guides RCA-4, 14, and 40, Alternative 4 should result in slight reduction to no change in impacts to the quality of MYLF habitat.

Recreational grazing standards in typical MYLF habitat (meadows and riparian areas) under Alternative 1-Modified vary from 25-45% use by weight according to vegetation type (herbaceous and perennial; shrubs and trees) and seral state (high-seral; mid-seral). In all use types, the percent use is decreased under the proposed action by at least 10% from the previous management guidelines (Alternative 3, No Action).

In addition, concurrent implementation of the Sierra Nevada Forest Plan Amendment Standard and Guideline RCA-41 prohibits pack and saddle stock grazing in standing water, saturated soils in wet meadows, and associated springs and streams occupied by the Yosemite toad (YT). As MYLF populations and habitat entails localized overlap with that of the YT, this Standard and Guide will provide extra protection from grazing impacts to MYLF where populations and habitat of YT are concurrent. Standard and Guide RCA-18 limits disturbance to meadow streambanks and lake and pond shorelines to 20% by length, providing further mitigation to the effects of stock upon MYLF and their habitat. The implementation of Critical Aquatic Refuges within the planning area where MYLF occur, in addition to Framework standards and guidelines RCA-4, 6, 12, 14, 19, 39, 40, 41b, FW-RCA-26, and FW-RCA-28 provide additional protection, monitoring, and mitigation for MYLF. Overall, Alternative 4 should result in a slight reduction of impacts by recreational stock use to MYLF and their habitat.

In areas currently experiencing high recreational use, increased grazing standards will help to slightly improve MYLF habitat quality. Currently heavily used areas will remain so, and areas lightly used or not used by humans should remain refuges for the MYLF. The trailhead quota for Alternative 4 does not present a level of direct and indirect human impacts upon MYLF that threaten the viability of the species.

Overall, Alternative 4 will result in reduced impacts to MYLF and their habitat. The consequence of reduced impacts to MYLF as a result of the proposed action is secondary relative to primary factors limiting the conservation and restoration of MYLF such as introduced fish and airborne pesticides. As past impacts of grazing and human uses to MYLF have not been quantified, the degree to which mitigation will be effectively measured and evaluated is less than optimal. A more complete understanding of the infective mechanism and routes of infection than currently exists is needed before creating issues of human and stock contact with MYLF individuals and populations within the planning area.

Cumulative Effects, All Alternatives

Introduced Non-Native Fish: The effects of introduced non-native fish upon native amphibians has emerged as one of the leading hypotheses to explain declines of ranid frogs in the American West (Hayes and Jennings 1986; Fisher and Shaffer 1996; Knapp 1996; Knapp and Matthews 2000). Predation on mountain yellow-legged frogs by introduced trout and charr is well documented (Needham and Vestal 1938, Bradford 1989, Knapp 1996) and a number of recent studies in the Sierra Nevada and the Central Valley found that native amphibians are largely absent from sites with introduced fishes, and conversely in sites containing amphibians seldom have introduced fishes (Bradford 1989, Bradford *et al.* 1993, Fisher and Shaffer 1996, Knapp and Matthews 2000). Non-native trout and charr have been introduced throughout the Sierra Nevada in lakes and streams that were historically fishless (Christenson 1977, Knapp 1996) and as early as 1915, Grinnell and Storer (1924) noted that mountain yellow-legged frogs tended not to occur in lakes with fish. Since then, Bradford *et al.* (1993) showed that the spatial distribution of mountain yellow-legged frogs has become fragmented due to the presence of introduced trout and charr in streams that may have once served as dispersal and recolonization routes. Predation by introduced fish may have eliminated frogs from many larger lakes, and made remaining small populations vulnerable to local extinction by preventing dispersal and recolonization (Knapp and Matthews 2000). Indeed, frogs are now quite scarce in deep water (≥2 meters) lakes which contain fishes, although this is the habitat that mountain yellow-legged frogs seem to frequent as adults in pristine habitats (Knapp and Matthews 2000) This scenario assumes that mountain yellow-legged frogs have metapopulation or source-sink population dynamics (Sjogren 1994), something that is currently under study (R. Knapp, K. Matthews, and V. Vredenburg, pers. comm.). As best can be observed, there have not been any habitat changes in Sierra Nevada lakes that have benefited introduced fishes over frogs (Knapp and Matthews 2000). However, the removal of fishes from high elevation lakes with the use of gill nets could be accomplished in up to 20% of the lakes that currently contain fish (but lack suitable spawning habitat) with potentially positive effects on local frog populations (Knapp and Matthews 1998, 2000).

Airborne Contaminants: The decline of mountain yellow-legged frogs and Yosemite toads in apparently “pristine” habitat inside national parks has raised the possibility that airborne contaminants may be responsible (Drost and Fellers 1994), although Knapp and Matthews (2000) feel that the pattern of fish introductions is more responsible for observed frog declines. Previous research by Cory *et al.* (1970) showed that airborne pesticides (largely DDT residues) were carried from the San Joaquin Valley to the Sierras where they were bioaccumulated by mountain yellow-legged frogs. With a number of new generations of pesticides now in widespread use in the Central Valley, their potential negative effects on the biota of the Sierra Nevada via pesticide drift cannot be dismissed (Aston and Sieber 1997, Datta *et al.* 1998, McConnell *et al.* 1998, Lenoir *et al.* 1999). Indeed, Davidson *et al.* (in review) found a significant correlation between airborne pesticide drift and the disappearance of mountain yellow-legged frog populations, a result that has been previously documented with California red-legged frogs (*Rana aurora draytonii*) in the state (Davidson *et al.* 2001). The initial results of a study of the effects of synthetic pesticides and airborne pollutants on Pacific treefrog (PTF; *Hyla regilla*) collected from the Sierra Nevada indicate that tadpoles from locations closer to the San Joaquin Valley have lower activity rates of the enzyme cholinesterase, an important enzyme in the function of the nervous system. Reduced cholinesterase activity can affect the respiratory system and lead to death. Similar but less significant trends were observed in adult PTF. In addition, 50% of adult and larval frogs collected within Yosemite NP contained measureable levels of diazinon and chlorpyrifos, as compared to 9% of frogs collected from coastal reference sites. Toxicity tests of chlorpyrifos and diazinon indicate that they are two of the three most toxic pesticides to PTF. These results for PTF imply more severe effects for species such as MYLF which are more closely associated to aquatic habitats, especially during their two to three year larval stage.

Increased UV-B Radiation: The hypothesis that amphibian declines may be caused by increases in ultraviolet (UV-B) radiation due to depletion of the ozone thinning in the atmosphere is consistent with the apparent global nature of declines (Blaustein and Wake 1990, Wake 1991) and that many declines have taken place in “pristine” high mountain habitats (e.g., boreal toads (*Bufo boreas boreas*) in the Rocky Mountains (Carey 1993), and Yosemite toads and mountain yellow-legged frogs in the Sierra Nevada (Kagarise Sherman and Morton 1993, Bradford et al 1994b). Blaustein *et al.* (1994) found reduced hatching success for boreal toad and Cascades frog eggs exposed to UV-B light (from roughly 80% hatching success with UV-B filtered out to 60% without the filter). However, it is unclear if the observed 25% reductions in hatching success are sufficient to cause population declines in species with such high fecundity. No differences between shielded and unshielded eggs were found for Pacific treefrogs. The three species were also found to have different levels of photolayse activity, a DNA repair enzyme, with Pacific treefrogs having higher levels than either the boreal toad or Cascades frog. Long et al (1995) found synergistic effects of UV-B light and low pH on egg development in the northern leopard frog (*Rana pipiens*). Recent UV-B studies on mountain yellow-legged frogs in the field and in the laboratory show that developing embryos are not being affected by current UV-B levels under actual field conditions, but are negatively affected by artificially increased UV-B levels in the laboratory (V. Vredenburg, pers. comm.). Potential negative effects of UV-B are probably linked to a number of other athropogenic factors and stressors.

Acid Deposition: Bradford *et al.* (1992) examined mountain yellow-legged frog egg and larvae tolerances to low pH in the laboratory and compared the tolerances to the peak observed acidity in Sierra Nevada lakes of pH values of 5.0. They found that down to a pH of 5.0, there were no differences in egg development or larval survival (although there may have been sublethal stresses). In a related study, water chemistry was compared at sites with frogs and apparently suitable sites without frogs. The results showed that neither pH nor the acid neutralizing capacity was found to be statistically different (Bradford *et al.* 1994b). Thus, acid deposition is not a likely cause, per se, of the decline of mountain yellow-legged frogs in the Sierra Nevada.

Climate Change: The 1987-1992 drought, which was severe across the entire Sierra Nevada even by historic standards, has been discounted as a cause of decline because some declines preceded the drought (Bradford *et al.* 1994a), and mountain yellow-legged frogs primarily use permanent bodies of water (Zweifel 1955, Mullally and Cunningham 1956). However, extended severe droughts may act synergistically with other factors. For example, Pounds and Crump (1994) hypothesized that the disappearance of the golden toad (*Bufo perigienes*) in Costa Rica may have been due to the combination of airborne contaminants and drought with resulted in higher toxic concentrations of contaminants than would normally be the case.

Research Activity: Researchers may effect frog populations across the entire range by handing animals, marking individuals, attracting predators (such as Clark's nutcrackers and black bears), or spreading pathogens from water body to water body via clothing and equipment. However, in the Tablelands area where Bradford *et al.* (1994a) found complete disappearance of frogs, only visual surveys were used that involved no direct contact with frogs or aquatic environments. Current research activities on frogs contain provisions to limit the spread of potential pathogens into frog environments (R. Knapp, pers. comm.; V. Vredenburg, pers. comm).

Production Livestock Grazing: Production livestock grazing within occupied MYLF habitat may have negative direct and indirect effects as a result of reduction in vegetative cover, trampling, erosion and chiseling of streambanks and shorelines, and reduction in water quality via introduction of urine and feces. The extent of these impacts within or outside the analysis area is not known. Since the MYLF population has suffered severe reductions within the past few decades, protection, maintenance, and restoration of remaining populations and habitat is important to any future conservation strategy/recovery plan.

Capable and suitable production grazing allotments that occur within the planning area are or will be subject to site-specific environmental analysis.

Monitoring

Monitoring needs for MYLF include :

1) Complete surveys of the entire planning area for MYLF (and other amphibians)

2) Increased monitoring of habitat quality and its relationship to MYLF populations.

3) Increased inventory and monitoring of disease pathogens (*Aeromonas* bacterium, Chytrid fungus) and their infection of MYLF populations.

Determination

It is my determination that implementation of any of the Alternatives for the Ansel Adams, John Muir, and Dinkey Lakes Wilderness Management Plan Final Environmental Impact Statement may affect individuals, but is not likely to result in a trend toward Federal Listing or loss of viability for the mountain yellow-legged frog.

This determination is based on the following:

1. Alternatives Modified-1, 1 and 2 plan to increase the minimum distance from campsite to water as well as for strengthen grazing standards. This should result in a slight improvement in the quality of MYLF habitat. Grazing and campsite placement under Alternatives 3 and 4 can be modified on a site specific basis for the protection of MYLF habitat when shown to be having unacceptable site specific impacts.

2. This proposal contains no management provisions that will impact lake and pond habitat beyond that which is currently occurring.

3. Concurrent implementation of the Sierra Nevada Forest Plan Amendment S&G's for Riparian Conservation Areas and Yosemite toad habitat in wilderness may have positive benefits where they overlap with MYLF habitats.

2. <u>Yosemite Toad</u>:

Direct and Indirect Effects

All Alternatives

Direct mortality of eggs, larvae or adults from trampling by recreational packstock is decreased with the implementaton of the Sierra Nevada Forest Plan Amendment Standard and Guideline (RCA-41) that prohibits pack and saddle stock grazing in standing water and saturated soils in wet meadows, and associated springs and streams occupied by the Yosemite toad. Habitat suitability will improve since adverse effects such as entrapment of toadlets in livestock hoof punches, and modification of pool or wet meadow flooded shallows will not occur. Elimination of grazing will also improve vegetative cover for toads to decrease the probability of predation events by birds and other predators.

Adverse effects of poor trail location such as diverting hiker and packstock traffic through Yosemite toad breeding areas will be mitigated through a trail relocation program specifically designed to reroute traffic away from the breeding areas. Additional adverse effects on Yosemite toad breeding areas associated with trails such as increased sediment transport, and water quality will be mitigated through the Trails Capital Improvement Program designed to improve trail design, and through implementation of the Sierra Nevada Forest Plan Amendment S&G's for Riparian Conservation Areas, RCA-6 and RCA-40 s.

There remains the potential for humans and dogs to accidentally trample toads, capture toads or handle the animals under any of the alternatives. Trailhead quotas under Alternative 2, Modified-1, and 1 may help to limit the number of humans accessing toad breeding and rearing habitats. Additional monitoring is needed to more accurately assess these affectors and whether additional mitigation measures are needed. Public education is needed and may be more effective to build wilderness users awareness concerning these issues.

Cumulative Effects

Fish stocking, toad handling and collecting by humans, acid rain, ultraviolet radiation, and pesticide drift from agricultural areas are also likely to affect Yosemite toad populations. Since this species can breed in shallow, ephemeral pools unsuitable for fish, and the adults spend most of their time outside of water, predation by fish is not as much of a concern as it is with the Mountain yellow-legged frog. Commercial livestock grazing allotments within occupied toad habitat are having adverse effects similar to packstock grazing though the extent of these impacts within the analysis area is not known. Commercial allotment planning is outside the scope of the Wilderness EIS.

Monitoring

Sierra Nevada Framework S&G RCA-41b requires monitoring of subsets of Yosemite toad occupied sites on a periodic basis. The Inyo NF is continuing an intensive survey and monitoring program begun in 1998 to locate all known Yosemite toad breeding areas and determine impacts associated with recreation.

Determination

It is my determination that implementation of any of the Alternatives for the Ansel Adams, John Muir, and Dinkey Lakes Wilderness Management Plan Final Environmental Impact Statement may affect individuals, but is not likely to result in a trend toward Federal Listing or loss of viability for the Yosemite toad.

This determination is based on the following:

1. Concurrent implementation of the Sierra Nevada Forest Plan Amendment S&Gs for Riparian Conservation Areas and Yosemite toad habitat in wilderness will have positive benefits to the species and its habitat, by directing the Forest Service to address adverse impacts where they may be occurring.

2. Implementation of Recreation Use Categories and trailhead quotas will not substantially change the current levels or patterns of human use in Yosemite toad

habitats in the wilderness from the existing situation. Under Alternatives 1-Modified, 1 and 2, the implementation of the minimum distance from campsite to water restrictions may result in a slight increase in riparian habitat quality, benefiting habitat of the Yosemite toad. Recreational impacts to Yosemite toad habitat other than poor trail location, and packstock grazing need further evaluation to determine if they may be detrimentally affecting the toad or its habitat at present.

3. California Spotted Owl:

All Alternatives

Direct and Indirect Effects

Spotted owl habitat will not be altered by this proposal. The majority of spotted owl PACs and SOHAs within the wilderness occur in areas of moderate to low use. Implementation of Recreation Use Categories will not change the current levels or patterns of human use substantially in spotted owl habitat in the wilderness from the existing situation. Spotted owls are tolerant of human presence particularly since much of their activity is nocturnal, so the potential for disturbance from recreational activities is low.

Cumulative Effects

No cumulative effects are thought to present any substantial impact to the spotted owl within the planning area.

Monitoring

Monitoring of the species occurs as part of the periodic nest site surveys and those monitoring requirements identified in the Sierra Nevada Forest Plan Amendment

Determination

It is my determination that implementation of any of the Alternatives for the Ansel Adams, John Muir, and Dinkey Lakes Wilderness Management Plan Final Environmental Impact Statement, may affect individuals, but is not likely to result in a trend toward Federal Listing or loss of viability for the California spotted owl

This determination is based on the following:

Some level of recreation-related disturbance is likely to continue after implementation of any of the Alternatives since the pattern of human use is likely to remain about the same within suitable habitat. Resident spotted owls should not experience a measurable change in the frequency or distribution of human presence. Spotted owls appear to tolerate non-threatening human presence within their territories. The majority of spotted owl sites are in areas experiencing little human use. None of the Alternatives will result in changes to spotted owl habitat.

4. <u>Pacific Fisher</u>:

All Alternatives

Direct and Indirect Effects

The planning area represents the upper limit of suitable habitat for the Pacific fisher. Very few fisher sightings are recorded in wilderness areas. Since the activities proposed will not modify fisher habitat, and current human disturbance impacts from recreational use are thought to be low direct effects are minimal. Some level of human disturbance to fisher may be occurring in the planning area. While not quantified, it can be expected to be less than the potential level of disturbance experienced by fisher in non-wilderness areas on the Sierra NF. Sierra Nevada Forest Plan Amendment S&G, PAC-RO3D for fisher will be implemented if den sites are located.

Cumulative Effects

Of the potential cumulative effects listed, only substantially increased human presence is likely to be of concern to the fisher within the planning area. Outside of the planning area, timber harvest and road densities are factors that can reduce habitat suitability for the fisher. The analysis area has very little suitable habitat and probably very few fishers. They are much more likely to be found at lower elevations in the general forest.

Monitoring

Any monitoring conducted will be part of an effort identified in the Sierra Nevada Forest Plan Amendment.

Determination

It is my determination that implementation of any of the Alternatives for the Ansel Adams, John Muir, and Dinkey Lakes Wilderness Management Plan Final Environmental Impact Statement, may affect individuals, but is not likely to result in a trend toward Federal Listing or loss of viability for the Pacific fisher.

This determination is based on the following:

None of the Alternatives will alter the current condition of fisher habitat within the analysis area. Fishers generally occur at lower elevations and in habitat types commonly found outside of the analysis area. The analysis area represents the fringe of suitable fisher habitat in this portion of the Sierras. Human disturbance associated with implementation of any of the Alternatives is not thought to be resulting in a loss of viability to the species.

IV. LITERATURE CITED

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V. PERSONAL COMMUNICATIONS

Dr. David Bradford. 2000. Research Scientist, Environmental Protection Agency. Las Vegas, NV.

Holly Eddinger. Fisheries Biologist, South Resource Zone (Pine Ridge and Kings River Ranger Districts), Sierra National Forest

Dr. Gary Fellers. 2000. Research Scientist. U.S. Geological Survey. Point Reyes, CA.

Dr. Roland Knapp. 2000. Aquatic Researcher Sierra Nevada Aquatic Research Lab, Mammoth, CA

Dr. Kathleen Matthews. 2000. Aquatic Researcher. U. S. Forest Service Pacific Southwest Experiment Station. Albany, CA.

Dr. Karen Pope. 2000. Research Scientist. U. S. Forest Service Pacific Southwest Experiment Station. Albany, CA.

Dr. Vance Vrendenburg 2000. Research Scientist. University of California, Berkeley, CA