BIOLOGICAL ASSESSMENT AND EVALUATION

For the

LONG MEADOW RESTORATION PROJECT

WESTERN DIVIDE RANGER DISTRICT
SEQUOIA NATIONAL FOREST

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SUMMARY

This Biological Assessment/Evaluation is prepared in compliance with the requirements of the FSM 2672.4 and provides for compliance with 36 CFR 219.19. It analyzes the potential impacts of implementing the Long Meadow Restoration Project on threatened, endangered, and Forest Service sensitive species.

No federal threatened or endangered species are known to occur in the project area. Region 5, Forest Service sensitive species with the potential to occur include the California spotted owl (*Strix occidentalis occidentalis*), great gray owl (*Strix nebulosa*), northern goshawk (*Accipter gentilis*), fisher (*Martes pennanti*), American marten (*Martes americana*), greenhorn mountain slender salamander (*Batrachoseps altasierrae*), and the mountain yellow-legged frog (*Rana muscosa*). A determination of "May affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability" was issued for all of the above listed species.

I. INTRODUCTION

The purpose of this Biological Assessment/Evaluation (BA/BE) is to review the potential impacts associated with the Long Meadow Restoration Project and its effect on terrestrial and aquatic species of concern. Specifically, the BA documents effects on federal listed species to determine whether formal consultation is required with U.S. Fish and Wildlife (USFWS). The BE determines whether the proposed action would contribute to a trend toward any Forest Service sensitive species becoming federally listed. The proposed action is to repair a large headcut that has become established at the northern end of Long Meadow. This document is prepared in accordance with the legal requirements set forth under section 7 of the ESA (19 U.S.C 1536 (c)), and follows the standards established in the Forest Service Manual direction (FSM 2672.42).

The Long Meadow Restoration Project encompasses the northwest portion of Long Meadow and is located in Township 22 South, Range 31 East, Sections 25 and 36, MDBM (Map 1). Upon review, no occurrences of federal endangered or threatened species or designated critical habitat were identified in the project area or vicinity. Seven Region 5 Forest Sensitive species occur, or have the potential to occur, based on habitat conditions within the project area and vicinity. These species will be considered in-depth and are listed in Table 1. Appendix A includes a detailed listing of other TES species that have potential to occur within the broader Sequoia National Forest but were eliminated from detailed analysis under this document based on the following criteria: season of use, habitat requirements, geographic range, or prior consultations with the USFWS. See Appendix A for detailed rationale. A determination of No Effect is rendered for all the species in Appendix A.

Table 1. Species considered for the Fallen Sequoias at the Trail of 100 Giants Project.

Common Name	Scientific Name	Status
Northern goshawk	*Accipiter gentilis*	R5 Sensitive
Calif. spotted owl	*Strix occidentalis occidentalis*	R5 Sensitive
Great gray owl	*Strix Nebulosa*	R5 Sensitive
American marten	*Martes americana*	R5 Sensitive
Fisher	*Martes pennanti*	R5 Sensitive, Federal candidate
Mountain yellow-legged frog	*Rana muscosa*	R5 Sensitive
Greenhorn mountain slender salamander	*Batrachoseps altasierrae*	R5 Sensitive

II. CONSULTATION TO DATE

A threatened and endangered (T&E) species list applicable to the Long Meadow Restoration Project area was requested on April 17, 2012 from the USFWS website (http://www.fws.gov/sacramento/es/spp _lists/NFActionPage .cfm). The list was reviewed and fulfills the requirement to provide a current species list pursuant to Section 7(C) of the ESA as amended.

III. CURRENT MANAGEMENT DIRECTION

Direction for threatened, endangered, and Forest Service sensitive species on National Forest Lands can be reviewed through the Forest Service Manual (FSM 2672.1), the Sequoia National Forest Land and Resource Management Plan (LRMP, USDA 1988) as amended by the 2012 Giant Sequoia National Monument Management Plan (here after Monument Plan, USDA 2012).

IV. DESCRIPTION OF THE PROPOSED PROJECT

Proposed Acton:

This project proposes five activities (described in more detail following this list) to restore and enhance Long Meadow and move it toward the desired conditions. These proposed activities are:

- Install plug structures.
- Install rock and vegetation (also known as a valley grade control structure).
- Plant various native riparian species in the meadow, including willows and sod.
- Use an existing access road during the implementation of the project.
- Install a temporary fence.

Project implementation would take place when flows are at their lowest and meadow conditions are at their driest, late summer to early fall. Equipment would only be allowed in the meadow when it is dry enough to support the weight. Water upstream of the project area may need to be diverted during excavation to prevent unnecessary sediment delivery downstream.

To minimize equipment disturbance in the meadow, all equipment routes would remain near the gully and along the meadow's margins. The shortest and most durable route from the meadow's margin to the installation points would be identified and used for equipment access throughout the implementation of the project. Disturbed areas from project implementation would be restored.

All mechanical equipment used in the construction would be cleaned to remove all soil, seed, and plant materials prior to entering the forest, to prevent the spread of noxious weeds. Vehicles used to transport personnel and materials, personnel clothing and footwear, or any other equipment or hand tools used would be cleaned to remove soil, seed, and plant materials before entering the Forest.

Plug Structures (also known as Pond and Plug)

This technique plugs the existing gully system through the creation of ponds, decreasing the water's velocity that is currently undercutting the existing headcut and causing it to continue.

Two plugs would be installed. The exact location would be staked in the field prior to implementation.

Creation of the plug structure would include removing soil from the sides and bottom of the gully and the surrounding areas and using it to create the plugs. The soil removal would be done in a manner that sculpts the gully in preparation for the ponds, which would fill with water and would help raise the water level to restore the meadow. The ponds would be designed and constructed to have irregular shapes and varying depths that will provide numerous habitats for riparian-dependent species. This process would relocate approximately 1,000 cubic yards of existing soil through the use of mechanical equipment, such as a backhoe, dozer, or a tracked excavator.

Sod and willows established in the gully bottom would be stockpiled and transplanted to pond edges and plug surfaces. Topsoil from all excavation areas would stockpiled adjacent to the plugs and used on top of the plugs once constructed.

Valley Grade Control Structure

A valley grade control structure is made of rock and soil and used to stop the forward progression of the current head-cut as well as preventing future head-cuts. For this project, the valley grade control structure will be located downstream of the plug structures, and above an existing partially intact dam. An estimated 200 cubic yards of 0.5- 2.0 foot diameter rock would be used to provide armoring at the lower end of the meadow. Some of the stockpiled soil removed from the gully will be added to the structure. It is anticipated that rock will come from existing stockpiles along Highway 178.

Re-vegetation

Rooted willows (large enough to have an established root ball) will be planted along the stream banks and around ponds. The willows and transplanted vegetation would stabilize the existing bank and trap sediment. Stockpiled sod and willows will be placed on the plug structures. Large conifers that have become established within the meadow will not be cut as part of this project unless they pose a safety hazard or limit equipment access during implementation of the project.

Access

Mechanical equipment would access the meadow using Forest Service Road 22S08A that is currently not open to public vehicle travel. This road would be temporarily opened for the purpose of moving equipment and materials to the meadow to complete the restoration project. Water bars and/or rolling dips may be installed to prevent erosion during implementation. Once the project is completed, the road will be closed and the proper drainage restored to prevent future erosion.

Temporary Fence

A temporary fence will be installed (approximately five to seven years) to keep horses out of the project area (see enclosed Map 1). This fence will be approximately 700 feet total length and will originate and terminate at the existing fence. Fence will be constructed of wood and/or metal posts and a minimum of three wires. The fence will be a take-down type fence, where the wire and metal stays would be disconnected from the posts and laid flat on the ground during winter months. Prior to use in the spring, the wire would be reconnected to the posts.

Project Design Features

Monitoring: Post implementation monitoring will be conducted to evaluate the effectiveness of the project and to determine if the meadow is trending toward desired condition over time. Extensive surveys have been conducted to document the existing conditions within the meadow. Monitoring work would take place immediately after the project is implemented and annually for a five year period. This monitoring would include evaluating sedimentation, plant species composition, the integrity of the installed plug structures, and the presence of any new headcuts.

Use of Limited Operating Periods (LOPs): Meadow restoration activities can temporarily increase ambient noise levels and result in ground disturbance which may impact sensitive species during their reproductive period. Given that project implementation will occur outside of these time frames as noted in the Monument Plan (USDA 2012), no LOPs need be established. The location of activity centers documented for the California spotted owl and northern goshawk are beyond the LOP distance of ¼ mile from the project site. Therefore, proposed actions are sufficiently removed to eliminate these concerns.

Greenhorn mountain slender salamander and Mountain yellow-legged frog: While no occurrence of either the mountain yellow-legged frog or the greenhorn mountain slender salamander have been detected through prior surveys, the following design features have been included as a preventative measure to further reduce any potential for harm. Pre-implementation surveys will be conducted again immediately prior to meadow restoration efforts for both species.

EXISTING ENVIRONMENT

Affected Area

Long Meadow encompasses an estimated 35 acres and is located at approximately 6,000 feet in elevation. The stream channel within the north eastern portion of Long Meadow has been eroding as a result of a large headcut. This headcut has eroded upstream approximately 375 feet; creating a 70 foot wide and 7 to 14 foot deep gully (see Appendix B, Photos 1 and 2). The total estimated sediment loss from within the gully is approximately 3,400 cubic yards[1]. This erosion process has created five additional smaller headcuts along the sides of the gully. For the last five years, the main headcut has continued to erode at an accelerated rate, averaging five cubic yards per year. This loss of soil is contributing effects to water quality (non-point source pollution) and downstream aquatic resources, including fish habitat.

Due to the headcut, the hydrologic function of the meadow is being compromised. This portion of the meadow has a lowered water table associated with the gully which inhibits floodwaters from connecting with its natural floodplain. As a result of this dewatering, meadow vegetation composition is shifting from traditional moist meadow species to dryer upland meadow vegetation types, allowing for conifers to grow (or encroach) into the meadow. Habitat for water-dependent or water-associated (aquatic) wildlife is being affected at the headcut site, and may become more prevalent throughout the meadow without direct action. Without action, the headcut will continue to migrate further upstream into the meadow and expand its impact on the meadow hydrology.

SPECIES and HABITAT ACCOUNTS

Species and habitat accounts were collected from the following sources: prior wildlife surveys in the project area and adjoining vicinity, species specific scientific literature, and comprehensive scientific information regarding the status and biology of the species presented and discussed in the Monument Plan (USDA 2012) and the Sierra Nevada Forest Plan Amendment (SNFPA FEIS, USDA 2001-Vol. 3, Chapter 3) hereby incorporated by reference. For brevity purposes applicable information in relation to this project has been summarized. For a comprehensive review of all biological aspects of the species addressed, consult the Biological Evaluation in the Monument Plan, Appendix M (USDA 2012).

[1] Five cubic yards is approximately the volume of a small dump truck. Sediment lost from the meadow system to date can be described as about 680 dump truck loads.

Northern Goshawk:

Historic and Current Distribution - The northern goshawk occurs in forested habitats throughout the northern hemisphere (USDA 2001). Range distribution comparisons of goshawk occurrence in California were evaluated in the SNFPA FEIS (USDA 2001) between Grinnell and Miller's data presented in 1944 and more recent data collected from Sierra Nevada Forests in the 1990s. This comparison showed little change in goshawk distribution and range extent throughout the Sierra Nevada. In 2001, there were a total of 577 known goshawk territories reported from the ten Sierra Nevada National Forests and Management Units. Territory numbers decrease as you proceed south along the Sierra Nevada with the Modoc and Lassen National Forests reporting the highest density (243 total sites) and the Sierra and Sequoia National Forests reporting the lowest densities (12 and 20 respectively) (Sequoia values corrected with new territories added since 2001, R.Galloway 2011). Fourteen of the 20 occur in the Giant Sequoia National Monument. Under the SNFPA FEIS (USDA 2001), 200 acre protected activity centers (PAC) were delineated surrounding all known goshawk breeding territories or territorial adult birds on National Forest System (NFS) lands. One northern goshawk PAC occurs south of the Long Meadow Restoration project site within Long Meadow Grove at the Trail of 100 Giants. This pair has been consistently recorded there since its discovery in 1990.

Habitat Preferences and Biology – Preferred habitat consists of older-age coniferous, mixed, and decidous forest habitat. Habitat models contained in the California Wildlife Habitat Relationship (CWHR) database rate the following vegetation types and strata as providing high nesting and feeding habitat capability for northern goshawks: structure and density classes 4M, 4D, 5M, 5D, and 6 in Sierran mixed conifer, white fir, ponderosa pine, montane hardwood-conifer, montane riparian, red fir, Jeffrey pine, lodgepole pine, subalpine conifer, and montane hardwood (CWHR 2005). Using the CWHR model, there are 208,590 acres of moderate and high suitability nesting and foraging habitat for northern goshawks in the Monument.

Northern goshawk nesting habitat is characterized by stands with dense canopy closure (50-90%) in mature forest with open flight paths under the canopy (McGrath et al. 2003). Nests are generally found in large green trees (≥30" dbh) located on gentle terrain, such as benches and flood plains. Northern goshawks use plucking perches to remove fur and feathers of their prey (Fowler 1988). Important habitat components for nesting and foraging sites also include an availability of snags (min 3/acre. >18" dbh) and downed logs (min 5/acre. >12" dbh) for prey populations. Goshawks initate breeding when the ground is still covered with snow and nests can be located near trail margins, meadow margins, or roads. The same nest can be used for several seasons, but alternate nests are common within a single territory. The goshawk pair at the Trail of 100 Giants is monitored frequently, with five separate nest locations identified within the PAC. The most recent nest site was documented in 2011, approximately 200 yards north east of the Trail of 100 Giants. Based on the continued documentation of this nesting pair, the potential for an additional overlapping territory within a 1 mile radius would be rare (Keene and Parks 2003). The Long Meadow Resoration Project site is approximately 0.75 miles distance from the nest location and therefore is unlikely to influence any additional goshawk territory.

Vegetation management activities that remove structual elements such as large live trees, canopy closure, snags and woody debris have the potential do degrade habitat quality. Human distrubance has the potential to cause northern goshawks to abandon nest sites during the nesting and post fledging period (February 15 through September 15). Current management standards and guidelines implement an LOP for projects that would occur within a ¼ mile of an activity center if actions could result in disturbance. Response to

disturbances can be quite variable and dependent on the individuals occupying the site or territory. To date, the pair located at Trail of 100 Giants appears tolerant of a fairly high level of distrubance. The Trail of 100 Giants receives a heavy amount of recreational use along the walking the trail especially on peak visitor weekends (Memorial Day, July 4th, Labor Day). Despite this ongoing activity, this pair continues to reproduce, nest, and produce young on a frequent basis.

California Spotted Owl

Historic and Current Distribution - The range of the California spotted owl includes the southern Cascades south of the Pit river in Shasta County, the entire Sierra Nevada Province of California (and extending into Nevada), all mountainous regions of the Southern California Province, and the central coast ranges at least as far north as Monterey County. California spotted owl populations in the Sierra Nevada remain relatively continuous and uniform in distribution, with an estimated 1,865 owl territories documented (USFWS, Federal Register May 24, 2006 [Volume 71, Number 100]). This includes 1,399 territories documented on NFS lands and an additional 466 owl territories on non-NFS lands (Ibid). The availability of existing habitat to support California spotted owl populations in the Sierra Nevada is not viewed as a limiting factor, with approximately 5 million acres located within national forests throughout the mountain range (USFWS, Federal Register May 24, 2006 [Volume 71, Number 100]).

The USFWS has conducted several significant status reviews of the Califorina spotted ow in response to listing petitions (published 12 month findings: USFWS 2003, USFWS 2006). The latest finding dated May 15, 2006, incorporated the results from the most recent meta-analysis on population dynamics, the best published and unpublished scientific and commerical information, and information submitted to them during the public comment periods. Based on this review, the USFWS found that listing the spotted owl was not warranted.

The population trend of this species in the Sierra Nevada have been monitored through general surveys, monitoring of nests and territorial birds, and demography studies (Verner et al. 1992; USDA Forest Service 2001, 2004, 2011, Munton et al. 2012; US Fish and Wildlife Service (USFWS 2006); Sierra Nevada Research Center 2007). Current data at the range wide, California, and Sierra Nevada scales indicate that, although there may be localized declines in poulation trend in some areas [e.g., localized decreases in "lambda" (estimated annual rate of populations change)], the distribution of California spotted owl populations in the Sierra Nevada is stable (Blakesley et al. 2010). Further meta-analysis of ongoing research is expected in 2014.

There are currently 73 California spotted owl PACs located in the Monument. PACs along with home range core areas (HRCAs) are part of the network of areas managed to provide California spotted owl nesting habitat (USDA 2001). Only one spotted owl PAC occurs near the Long Meadow Restoration site, located to the south within Long Meadow Grove at Trail of 100 Giants.

Habitat Preferences and Biology – On a state wide basis, the majority of documented spotted owl sites occur in mid elevation mixed conifer forests (80%), 10% occur within red fir forests, 7% in ponderosa pine/hardwood forests, and 3% occur in other forest types such as: east-side pine, ponderosa and Jeffrey pine and foothill riparian/hardwood (Verner et.al 1992 IN: USDA 2001, USFWS, Federal Register: February 14, 2003 [Volume 68, Number 31]). In studies referenced by Gutierrez et al. (1992), California spotted owls preferred stands with significantly greater canopy cover, total live tree basal area, basal area of hardwoods and conifers, snag basal area for nesting and roosting. In general stands suitable for nesting and roosting have (1) two or more canopy layers, (2) dominant and co-dominant trees in the canopy averaging at

least 24 inches in diameter, (3) at least 70% total canopy cover (including the hardwood component), (4) higher than average levels of very large, old trees, and (5) higher than average levels of snags and large downed woody debris. The CWHR database recognizes the following size and density classes of these vegetation types as providing high nesting and feeding habitat capability for the California spotted owl: CWHR classes 4M, 4D, 5M, 5D, and 6. Using the CWHR model, there are an estimated 210,328 acres of moderate and high suitability nesting and foraging habitat for the California spotted owl in the Monument.

The California spotted owl breeding cycle extends from mid-February to mid to late September. Egg laying through incubation, when the female spotted owl must remain at the nest, extends from early April through mid to late May (USDA 2012). Young owls typically fledge from the nest in mid to late June, but remain in close proximity to the nest stand. California spotted owls nest in a variety of tree species both live and dead (snag). Nests are often placed in pre-existing structures such as cavities, broken top of trees, and other platforms created in the canopy such as mistletoe brooms, debris jams, or old raptor and squirrel nests (Gutierrez et al. 1992, 1995). Trees selected for these purposes are quite large, typically exceeding 30" in diameter.

Forest or vegetation management and recreational activities have a potential to disrupt spotted owl nesting efforts and reproductive success when located close to the nest tree. Current management standards and guidelines implement a LOP for projects that would occur within a ¼ mile of an activity center if those actions could result in disturbance. The PAC at Trail of 100 Giants is approximately 0.75 miles away from the project site. Review of field data show consistent documentation of "pair occupancy" at this site over the last decade and a half. The latest survey in which reproduction was confirmed was conducted in 2009 with a nest and young located just uphill from the Trail of 100 Giants. Young fledged from the nest by early June. An additional "historic visit" survey was conducted in 2011 for wildlife crew training purposes. "Pair occupancy" was again detected in the same vicinity as in 2009.

Great Gray Owl

Historic and Current Distribution -The great gray owl is a Holarctic species. It remains evenly distributed across its range, but has variability in local distribution. In the U.S. its range includes Alaska, Washington, northern Idaho, western Montana south through the Cascade and Sierra Nevada ranges to east-central California, west central Nevada, and northwest Wyoming. Prior to 1989 the southern extent of this species was thought to occur near Yosemite National Park. This has been expanded through detections confirmed on the Stanislaus, Sierra, and Sequoia National Forests. The bulk of the detections recorded on Sequoia National Forest have occurred on the Hume Lake District. There has been only one confirmed sighting of a great gray owl on the Western Divide District at Deep Meadow in 2001. This site is located approximately 12 air miles north of the Long Meadow Restoration Project Area. Additional great gray owl surveys were conducted throughout the North Road (Deep Meadow) on several occasions, and in other areas of suitable habitat along the Western Divide Hwy (including Long Meadow) to verify any resident occupancy. Surveys included a variety of efforts conducted by the Institute for Bird Populations, the Forest Service, and the California Department of Fish and Game in 2002 and 2005, and by the Forest Service in 2012. No detections of great gray owls were recorded. There are no great gray owl protected activity centers currently established on the Western Divide District due to lack of documented occupancy or nesting.

Habitat Preferences and Biology – In the Sierra Nevada, great gray owls are found in mixed conifer forest from 2,400 to 9,000 feet elevation where such forests occur in combination with meadows or other vegetated openings. Both old-growth and second-growth forests are used if suitable nest sites are available. Research studies that have documented great gray owl nest sites in the field show they most commonly

occur in large trees and in stands with higher densities of snags. Nest stands most frequently occur in Sierra mixed conifer, lodgepole and red fir vegetation types (CWHR size class 4 and 5 with M and D density classifications). Nest trees selected on the Stanislaus National Forest averaged 32" dbh, with nest trees inYosemite National Park averaging 45"dbh. Large snags (>24 inch dbh) averaged 5-6 snags/acre at nesting areas in Yosemite National Park, but were less common in areas on adjacent National Forest land where great gray owls also occurred (Winter 1986).

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

Nest locations typically occur adjacent to, or upslope from, meadow environments. Nests located on the Stanislaus National Forest and Yosemite National Park were generally located within 280 yards (840 feet) of the meadow edge, with an average distance of 166 yards (498 feet) from the meadow. Nest locations often occurred on upland slopes above meadows. The smallest montane meadow documented with a nesting territory is 14 acres, although Winter (1986) believes that 25 acres is the smallest for successful nesting over time. Riper and Wagtendonk (2006) reported breeding summer home range for females to average 61.47 ha (155 acres), while males averaged 19.89 ha (50 acres) for the same period, with over 60% of all relocations occuring within 100 meters (328 feet) of a meadow.

The diet of the great gray owl may vary by locality but consists primarily of small mammals, predominately rodents. Most available literature indicates that great gray owls in the western United States overwhelmingly select two prey taxa: voles (*microtus spp*.) and pocket gophers (*Thomomys spp*.). Voles prefer meadows with dense herbaceous vegetative cover (Ziener et al. 1990). A four-inch stubble height at the end of the growing season is thought to provide suitable cover for voles (Beck 1985) although other studies suggest herbaceous heights of 12 inches are preferred (Greene 1995). Gophers are predominately subterranean but they also appear to have herbaceous cover prefrences (Greene 1995). Foraging habitat in the Sierra Nevada is generally open meadows and grasslands in forested areas, and trees along the forest edge are used for hunting perches. Greene found that sites occupied by great gray owls had greater plant cover, vegetation height, and soil moisture than sites not occupied by great gray owls. Stubble height post season throughout Long Meadow is estimated to range from 8" to 12" (pers. comm. J. Loehner 2012). The horse pasture used as part of the permit which encompasses the restoration site, receives only light horse use at gathering times. Stubble heights post season in this area outside of the gully are slightly higher.

Marten

Historic and Current Distribution – In California, marten are currently distributed throughout the Sierra Nevada and Cascades (Buskirk and Zielinski 1997) between the elevations of 5,500 to 10,000 feet, but most commonly found in the Sierra Nevada above 7,200 feet (Cablk and Spaulding 2002). For example, 81% of the 31 marten detected over an eight year study on the Stanislaus National Forest were recorded at elevations above 6,562 feet (, pers. comm. T. Hofstra IN: USDA 2012). This distribution coincides with snowfall levels greater than 9.1 inches per winter month (Krohn et al 1997). Data from the Southern Sierra Nevada Fisher and Marten Study located within the upper Tule River Basin, showed the mean elevation for marten detections was 6,535 feet (N=18). The bulk of the marten detections throughout the Sierra Nevada occur on National Forest System lands.

Extensive marten surveys have been conducted across the Sequoia National Forest since 1991, with numerous detections noted throughout the Monument. The SNFPA Long Term Monitoring Report noted that marten are more commonly detected on Sierra National Forest than on Sequoia National Forest, and that they have not been detected on the west slope of Sequoia NF south of Tulare County (USDA 2007). These results were supported in findings by Kurcera et al (1995) which noted negative survey results for marten in the southern tip of Tulare County and in Kern County (pers. comm. R. Truex 2010). The closest detection of marten to the Long Meadow Restoration Project area occurred approximately 1.5 air miles south east in 2004.

Habitat Preferences and Biology - Marten habitat includes mature moderately moist conifer forests interspersed with meadows. Conifer forest types of importance to this species within the Sierra Nevada include red fir, lodgepole pine, subalpine conifer, mixed conifer-fir, Jeffrey pine, and eastside pine (Simon 1980, Spencer 1981, Spencer et al. 1983, Zeiner et al. 1990, Cablk and Spaulding 2002), although Self and Kerns (2001) found martens select white fir stands at lower elevations in northern California. The CWHR database identified habitat stages that are moderately important to include: 4M, 4D, 5M, 5D, and 6. Using the CWHR model (CWHR 2005), there are an estimated 139,131 acres of high suitability habitat for marten in the monument.

Many studies suggest marten have a preference for mature coniferous forest habitats which contain large diameter trees and snags, large down logs, and moderate-to-high canopy closure. Buskirk and Powell (1994) suggested that marten tend to utilize stands that are structurally complex and have denser (although not uniform) overhead canopy cover. In the northern Sierra Nevada, marten selected stands with 40 to 60 percent canopy closure for both resting and foraging, and avoided stands with less than 30 percent canopy closure (Spencer et al. 1983). Koehler et al. (1975) also indicated that marten avoid stands with less than 30 percent canopy cover; however, Bull et al. (2005) in northeast Oregon found marten avoided stands with less than 50% canopy cover. While this may suggest that martens prefer use of forests that provide at least moderate-to-dense overhead cover, some individual tolerance seems to exist for occasional use of more open environments providing their representation across the landscape is not expansive. Marten have been noted to cross small openings, narrow road prisms, and to travel and forage along forest/meadow edge environments, and within burn areas (Koehler and Hornocker 1977, Buskirk and Powell 1994). Cablk and Spalding (2002) snow-tracked marten at the Heavenly Ski Resort (Lake Tahoe) and found that where marten were detected, the mean canopy closure was only 30%. Marten were noted to frequently cross and forage within open ski runs. It's generally speculated that forests that provide low overhead canopy (<30%), or which contain large open areas devoid of shrub or over-story trees are avoided because they present an increased risk for avian predation (Buskirk and Powell 1994, Bissonette et al. 1988, Allen 1982). In summary, marten are known to travel through forested areas that are not preferred composition to areas of more suitable habitat, but this may be restricted when large openings combined exceed more than 25% of the watershed area (Hargis and Bisonette 1997).

Standing dead and down material such as large snags, large downed logs, and debris piles provide protection from predators, habitat for prey and access points to subnivean (below snow) spaces that provide protective thermal micro-environments, especially in the winter (Buskirk and Powell 1994, Spencer et al. 1983, Thompson and Harestad 1994, Bull et al. 2005). Bull et al. (2005) found marten in northeastern Oregon prefer habitats with high volumes of dead and down trees, and avoid areas with low densities of dead trees. Hence, large coarse woody debris (snags, downed logs, large branches, and root masses) are an important winter habitat component for both resting/denning and foraging. In the Southern Sierra Fisher and Marten Study (Zielinski et al. 1995, unpublished Progress Report III), marten rest sites (N=114) were identified through radio telemetry methods. Marten rested most commonly in structures near the ground including

large logs, rocks and rock outcroppings, root-wads, and burrows. Tree rest sites were used more often in winter than summer.

Marten have been identified by most researchers as habitat specialists but dietary generalists and opportunistic in their foraging strategy (Ruggeriero et al. 1994, Martin, IN Buskirk et al. 1994, USDI 2004). Some authors suggest that their ability to adjust predatory patterns and prey type are important factors that enable them to balance energetic needs (Buskirk and Powell 1994). Marten eat a wide diversity of prey items, which include small to mid-sized mammals, birds, fruits and nuts, vegetation, and carrion. Various studies in the Sierra Nevada indicate that martens have a strong preference for forest-meadow edges, and riparian forests appear to be important foraging habitats for voles (Spencer et al. 1983, Martin 1987). Voles are common in riparian zones and are important year-round prey for Sierra Nevada marten (Zielinski et al. 1983, Hargis and McCullough 1984, Martin 1987). Both Simon (1980) and Spencer (1981) found heavy marten use along Sierra Nevada meadow edges. Marten preferred foraging in areas within 197 feet of a meadow, but avoided areas greater than 1,312 feet from a meadow and rarely ventured farther than 33 feet within a meadow (Spencer et al. 1983). Spencer et al. (1983) also found martens to prefer areas with an abundance of Douglas squirrel feeding sign.

Fisher

Historic and Current Distribution - Fisher historically occurred in California from the mixed conifer forests of the north coast, east to the southern Cascades, and south throughout the Sierra Nevada (Zielinski 2004). Research suggests that the fisher's range in California has become disjointed and is now limited to two populations, one in the northwestern portion of the state that extends into southwestern Oregon, and the other in the southern Sierra Nevada (Yosemite Park southward) (Zielinski et al. 1995, Lofroth et al. 2010). In the southern Sierra Nevada, fishers most commonly occur at elevations of 5,000 to 8,500 feet (Zielinski et al 1995), and overlap sympatrically with marten occurrence at these elevations. Long term status and trend monitoring have detected fisher as low as 3,110 and as high as 9,000 feet in the southern Sierra Nevada, but do not represent the bulk of the detections recorded through these efforts and are considered extremes.

The USFWS received a petition to list a distinct population segment (DPS) of the fisher, including portions of California, Oregon, and Washington, as endangered pursuant to the Act, and to concurrently designate critical habitat for the DPS in November of 2000. On April 8, 2004, USFWS announced their 12 month review finding that the petitioned action was warranted, but precluded from listing due to other high priority actions to amend the Lists of Endangered and Threatened Wildlife and Plants (USDI 2004). The fisher was added to their candidate species list and in the interim continues to be managed as a Forest Service sensitive species until a final listing proposal is published.

Status and trend monitoring for fisher in the Sierra Nevada was initiated in 2002 as part of the Sierra Nevada Forest Plan Amendment FEIS; the monitoring objective is to be able to detect a 20 percent decline in population abundance and habitat (USDA 2006). This monitoring includes intensive sampling to detect population trends on the Sierra and Sequoia National Forests, where fisher currently occur, and is supplemented by less intensive sampling in suitable habitat in the central and northern Sierra Nevada specifically designed to detect population expansions. Preliminary results reported indicated that fishers are well distributed in portions of the Sequoia and Sierra National Forests, with annual occupancy rates consistently higher on the Sequoia than the Sierra National Forest (USDA 2012, Appendix M, Tables 84 and 85). Fishers have not been detected in the northern, central or eastern Sierra Nevada Mountains. A recent analysis of the SNFPA Long Term Monitoring data was completed which analyzed a core of 243

sample units from 2002 through 2009 (Zielinski et. al 2013). Findings suggest that over the 8-year period, there was no trend or statistically significant variations in fisher occupancy rates in the southern Sierra populations; however, given variety of continuing risk factors, continued monitoring is highly favored. Based on a review of survey efforts, multiple detections of fisher have been recorded around the project vicinity (detection distances range from 1.5 mile to 5 air miles away as noted by the 2002-2008 Long Term Monitoring Surveys and 2004 OSV Surveys).

Habitat Preferences and Biology - In the Sierra Nevada, fisher habitat occurs in mid elevation forests. Davis et al. (2007) refined the general state wide CWHR model to reflect only those forest types and structure classes (4M,4D, 5M, 5D, and 6) present in the southern Sierra Nevada: Jeffrey pine, montane hardwood-conifer, Ponderosa pine, Sierran mixed-conifer, and white fir, terming it CWHR 2.1. Using the CWHR 2.1 model, there is an estimated 149,464 acres of moderate and high suitability fisher habitat in the Monument. Comprehensive reviews of research literature suggest fisher typically select forested stands that are complex structurally (Schempf and White 1977, Ruggiero et al. 1994, Buskirk et al. 1994). Occupied stands contained denser, but not necessarily uniform, overhead canopy provided through a combination of trees and shrubs; a high density of snags, fallen trees, and limbs close to the ground; and stands with a multi-layered condition (Ruggerio et al. 1994). Fisher in the west are also highly correlated with the use of riparian corridors as travel routes, for resting sites, and foraging areas (Buskirk et al. 1994). Fishers tend to avoid large open areas. Wier and Corbould (2010) found that the probability of a home range area being occupied by fishers decreased with increasing amounts of open area.

Den site structural elements must exist in the proper juxtaposition within specific habitats in order to provide a secure environment for birth and rearing of fisher kits. Natal dens, where kits are born, are most commonly in tree cavities at heights of greater than 20 feet (Lewis and Stinson 1998). Maternal dens, where kits are raised, are often in cavities closer to the ground (Lewis and Stinson 1998). Den tree data collected in Kings River study area on the Sierra National Forest in 2008 and 2009 (Purcell, pers. comm.) included use of black oak, white fir, incense cedar, ponderosa pine, and sugar pine. Oaks selected as den sites averaged 31.9” dbh and conifers averaged 40.7” dbh. Twenty-three of 52 dens (44%) were in black oaks, which do not typically leaf out until mid–late May, thus providing little canopy cover during actual use periods. All confirmed births through the 2008 field season occurred between 30 March and 11 April, and natal dens were occupied for 2 to 8 weeks.

As of 1998, Truex et al. noted natal dens in the Southern Sierra were located in white fir or black oak. Subsequently, most natal and maternal dens were in large conifers (white fir, sugar pine or Ponderosa pine in southern Sierra) or oaks (California black oak in southern Sierra), generally in live form (Truex et al. 1998, Mazzoni 2002, Zielinski et al. 2004a). All natal dens were established during the last week of March or the first week in April and were occupied for 4 to 7 weeks. The canopy closure surrounding these den trees ranged from 89 to 97 percent, measured by spherical densiometer (implying a bias on the high side for remotely sensed canopy coverage, as typically measured by the Forest Service). The mean dbh of dens in white fir was 49.4 inches, compared to only 26.3 inches in black oak. It is important to note the smaller dbh of oaks used as den trees, inferring that they achieve the requisite structural characteristics at smaller sizes than conifers.

Food habits studies in the southern Sierra Nevada show fisher utilize a wide diversity of prey items. These include squirrels (California ground squirrel, western gray squirrel, and Douglas squirrel), mice, voles, deer carrion, beetles, social wasps, false truffels, alligator lizards, and berries.

Greenhorn Mountain Slender Salamander

The relictual slender salamander (*Batrachoseps relictus*), a Forest Service sensitive species, was recently reclassified. The previous geographic range for the relicutual slender salamander extended from the Kern River Canyon north to the Tule River Basin with two principal distributional units identified which included: 1) lower Kern River Canyon, where relictual slender salamanders were known historically from six sites at elevations of 1,590 feet to 2,395 feet; and 2) higher elevations in the Greenhorn Mountains north to the Tule River drainage, at elevations of 3,690 feet to 8,005 feet. There was also a single record of this species for the western margin of the Kern Plateau, east of the Kern River, at 8,005 feet.

Jockusch (et al. 2012) reviewed both morphological and molecular data which suggested that populations of the *b.relictus* in the lower Kern River Canyon were the same as those found in the Breckenridge Mountains, while populations from north of the Kern River previously treated as *b.relictus* belong to an undescribed species. The data also showed that the distinctiveness of populations from the Upper Kern River Canyon. Therefore two newly described species have been described. These include *Batrachoseps bramei* for populations from the Upper kern River Canyon and *Batrachoseps altasierrae* for populations north of the Kern River through the Tule River Canyon which would be applicable to the Long Meadow Project area. While the naming conventions have changed the general biology as known is the same, and will continue to be addressed as a sensitive species.

Sequoia National Forest contracted with the California Academy of Sciences (CAS) to review collections from six natural history museums in order to further refine local distributions for a variety of amphibian and reptile species of concern, which included the relictual slender salamander (now greenhorn mountain slender salamander). Of the 1,984 total species reviewed, 350 voucher specimens of the relictual slender salamander were identified as collected from Sequoia National Forest. None of the specimens reviewed were collected from Long Meadow. CAS also conducted field surveys across the Forest in 2000 and 2001, which included suitable habitat in Redwood Meadow and Long Meadow. No detections of the relictual slender salamander were recorded in these efforts. CAS recorded one relictual slender salamander however at Double Bunk Meadow approximately 1.75 air miles southeast of the project site. The review of their data, in light of the recent reclassification, suggests that populations of *B.altasierrae* are healthy both in the Greenhorn Mountains and within the Tule River drainage (Hansen 2006, Jockusch et al. 2012).

This slender salamander is most often associated with streamside zones, seeps/springs, meadows, and moist wooded canyons in oak woodland and Sierran mixed conifer forests. Habitat for this species is often localized in relatively small moist sites that contain an overstory of trees or shrubs and abundant rocks, litter, or woody debris, and along meadow fringes where woody debris occurs. Typical overstory species include Ponderosa pine, sugar pine, incense cedar, white fir, white alder, big leaf maple, canyon live oak and black oak.

It most commonly occurs under some form of surface cover (logs, leaves rocks), with limited above ground activity only during periods of adequate soil moisture. In mid elevation conifer forest, this may extend from April - November, especially for creek, seep or meadow margin populations. At lower elevations, the period of seasonal activity is shorter due to dry summer conditions, and typically extends from late fall rain events until May. Individual salamanders move beneath the surface in burrows or rock rubble during dry periods and during the coldest winter months (Hansen, 2006).

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

Mountain Yellow-legged Frog (MYLF)

The mountain yellow-legged frog is a near-endemic species to California (primarily restricted to California and a small area of Nevada), historically ranging in distribution from southern Plumas County in northern California to northern San Diego County in southern California. The historic distribution of MYLF (*Rana muscosa*) in the Sierra Nevada was thought to be relatively continuous from the vicinity of La Porte in southern Plumas County southward to Taylor and French Joe Meadow in southern Tulare County. Recent taxonomy studies using DNA, morphology, and mating calls resulted in new classifications of this species into two separate species, *Rana muscosa* and *Rana sierrae* (Vredenburg et al. 2007). The two species, however, are referred two collectively as members of the mountain yellow-legged frog complex, but differ in a number of morphological and genetic aspects.

Rana sierrae occurs in areas north of the Middle Fork and South Fork of the Kings River, and *R. muscosa* occurs from the divide between the Middle Fork and South Fork of the Kings River (Monarch Divide, Cirque Crest, Mather Pass) south to at least Taylor Meadow in southern Tulare County. Isolated populations *R. muscosa* were also present on Breckenridge Mountain in Kern County. There are also populations of this species reported in the Transverse and Peninsular Ranges within the San Gabriel, San Bernardino, and San Jacinto Mountains, and on Palomar Mountain. The frogs in the southern Sierra Nevada are isolated from the frogs in the mountains of southern California by the Tehachapi Mountains and a distance of about 140 miles (USDI 2002).

Since about 1970, members within the MYLF complex showed that numbers and populations had undergone a precipitous decline throughout the range of Sierra Nevada. It is estimated that populations have undergone a 50 to 80 percent reduction (USDI 2003). The US Fish and Wildlife Service has listed nine populations of *R.muscosa* in southern California found only in the San Gabriel, San Bernardino, and San Jacinto Mountains as a Distinct Population Segment (DPS). The remaining portion of the *R.muscosa* range in the southern Sierra Nevada Mountains is not listed by the USFWS.

Several historic *R. muscosa* populations were once documented throughout Sequoia National Forest from 1954 through 1970. Subsequent surveys have been conducted Forest-wide within these historic locations, and in other areas of suitable habitat (Martin 1992, Cal Academy of Sciences 2001 and 2002 unpublished reports). Today, occurrence of this species on Sequoia National Forest is limited to three existing populations all of which occur in the Golden Trout Wilderness at significant distances away from the Long Meadow Restoration Project area. Suitable habitat within the Long Meadow Restoration Project was

surveyed through various efforts in 2000 and 2002 (Cal Academy of Sciences) and in 2011 (Forest Service personnel). No MYLF were detected through these surveys.

The MYLF inhabits ponds, lakes, tarns and streams in montane riparian, lodgepole pine, subalpine conifer and wet meadow habitat types from 4,500 feet to over 12,000 feet elevation (Zweifel 1955, Ziener et al. 1988). Current data suggest that Sierran populations of MYLFs are most abundant in high elevation lakes and slow-moving portions of streams, although populations from the extreme southern extent (Transverse and Peninsular Ranges) are found primarily in fast-flowing streams. Adult MYLF are highly aquatic and are typically associated with near shore areas for reproduction, cover, foraging and over-wintering (USDA 2001). MYLFs are thought to prefer well illuminated, sloping banks of meadow streams, riverbanks, isolated pools and lake borders with rocks or vegetation near the wetted edge. Perennial streams and meadows with low gradients and deep pools and undercut banks are the areas that are most likely to have suitable habitat (USDA 2001). The species extensively uses deep water ponds (deeper than 8.2 feet) that have open shorelines and lack introduced fishes (Matthews and Pope 1999, Knapp and Matthews 2000, Knapp 2003). Adults are typically found sitting on rocks along the shoreline usually where there is little or no vegetation (Wright and Wright 1933). Both larvae and adults prefer open shorelines with gentle slopes and shallow water two to three inches deep. There are approximately 3.5 miles of perennial stream within sub-watershed 8 H-C which encompasses the Long Meadow Restoration project area. Habitat at the restoration site contains poor quality habitat due to the lack of deep pools environments and basking sites.

In the Sierra Nevada, adult mountain yellow-legged frogs apparently hibernate during the coldest winter months. Both adults and larvae generally over-winter under ice emerging in the spring immediately following snow melt. Breeding activity begins early in the spring and can range from April at lower elevation to June and July in higher elevations.

EFFECTS OF THE PROPOSED ACTION

Direct and Indirect Effects:

Disturbance

Northern Goshawk, California Spotted Owl, Great Gray Owl, Marten, and Fisher:

Noise disturbance can cause nest or den abandonment if it occurs during critical time frames of the reproductive cycle resulting in the loss of recruitment. The potential for these factors to occur with implementation of this project are low. Project activities would occur in late September and would be outside the breeding season for the above species. In addition, where documented spotted owl and goshawk activity centers are known near the project site, they occur at distances beyond the recommended LOP distance of ¼ mile. Some alteration in foraging patterns by ground based mammals may result during implementation, but these are expected to be short term given the expected duration (3 weeks). This suggests that any increased noise levels would have little long term influence. Proposed restoration actions are not anticipated to directly disturb or alter stand features that may be utilized for nest/den structures (i.e. large live trees, large snags, or large down logs) and therefore eliminate this threat.

Greenhorn Mountain Selender Salamander and Mountain Yellow-legged Frog:

While surveys have not detected either the greenhorn mountain slender salamander or the mountian yellow-legged frog, there is the potential that an undetected individual could be killed or injured if present.

Conducting meadow restoration work in late summer when meadow conditions are dry and presence of water is limited will help to eliminate conflicts from restoration work. Additional provisions have been incorporated to repeat surveys at the restoration site directly in advance of project implementation also lowering the change for mortality or harm. Should individuals be discovered during any phase of the project, they would be removed to other suitable habitat in Long Meadow. Use of specified Best Management Practices (BMPs) by the District Hydrologist will further decrease the potential for direct and indirect disturbance to aquatic habitats and water quality.

Effects to Suitable Habitat

California Spotted Owl, Northern Goshawk, Great Gray Owl, Fisher, and Marten:

Indicators of change used to assess impacts on suitable habitat from proposed project actions include the loss of stand features of importance associated with nest/den habitats. These include the reduction in the availability of large live trees (≥24" dbh), decreases in canopy closure, decreases in the availability of large snags and decreases in the availability of down woody debris.

The proposed project would not decrease the amount or distribution of suitable habitat found adjacent to the meadow. The restoration work would be focused within a relatively small portion of the meadow and impact approximately three acres. The access route needed to move equipment into the meadow is anticipated to impact less than one acre of meadow fringe habitat. As previously stated, restoration actions are not anticipated to require removal of any large live trees. It is estimated that some small trees (<15" dbh), may need to be cleared to access the meadow. Given their size, they do not represent suitable nest or den structures and would be left on site as woody debris. Their removal would result in little to no appreciative change in existing canopy closure given the diversity and number of overstory trees found along the meadow fringe. No snags have been identified for removal as part of the project, and the general availability of snags throughout the forested landscape is not considered a limiting factor. Past episodes of drought-related mortality and natural fire have generally increased snag representation over the landscape as a whole. The availability of ground cover in the form of large woody debris recommended for westside vegetation types as specified in the Monument Plan (USDA 2001) is currently being met throughout the forested landscape.

Some short term displacement or shifts in meadow prey species composition may occur as a consequence of the restoration work, but would be confined to 3 acres or less and represent 8% or less of the entire meadow. These effects are not anticipated to be long term and would not occur within the breeding season when higher nutritional requirements have a potential to be present. Species such as the marten typically forage along the meadow fringe and not deeply within the meadow. Travel routes which access the meadow and those near the gully, where plug construction would occur, will be limited to defined routes to reduce impacts to meadow vegetation. This will leave areas within the 3 acres that have little to no impact from project activities. The balance of the meadow would not be impacted by the restoration work.

Greenhorn Mountain Slender Salamander and Mountain Yellow-legged Frog:

The project restoration site is currently not suitable habitat for the mountain yellow-legged frog or the greenhorn slender salamander. The affected reach lacks deep pool environments desired by the mountain yellow-legged frog, and exhibits drier site conditions as a result of the headcut. Surveys in 2000, 2002 and 2011 did not detect mountain yellow-legged frogs in Long Meadow or its vicinity. This project would

improve the potential for suitable habitat by creating ponds, or deep pool environments, and restoring the stream channels hydrologic function and connectivity.

No Greenhorn Mountain slender salamanders were detected through meadow surveys conducted in 2011. Project access points to allow equipment to enter the meadow will be limited. Access points will avoid areas with large woody debris or features that may serve as an attractant for this species. Given that the project would only impact a small portion of the overall meadow fringe environment, it is not anticipated to result in permanent loss or displacement of habitat. Large woody debris is present around the entire meadow perimeter for suitable habitat for this species.

Cumulative Effects:

Introduction - The intent of the cumulative effects (CE) section of the BA/BE is to place the proposed action in context with past, present, and reasonably foreseeable actions which, when considered collectively, may affect the species of concern. These actions may include both natural and human-caused events on Forest Service System Lands and those known on adjoining private property. Past actions considered in this analysis include those not previously captured through the last vegetation mapping update conducted in 2008. For assessment of future projects, the Forest completes a quarterly "Schedule of Proposed Actions (SOPA)" which tracks proposals that are ongoing or have sufficient detail to insure they are reasonably foreseeable (generally not more than 5 years out). The total list of actions presented on the SOPA is not included here. Some projects have been cancelled or are undergoing revision, with others not included because they have limited scope and intensity and present no appreciative impact on the species considered or their available habitat.

Defining Cumulative Effect Analysis Area - The CE analysis area vary by species. The largest chosen extent included is an evaluation of a 1.5 mile radius buffer, centered from the project location. This value is recognized as a conservative home range size for the California spotted owl and would incorporate typical home range sizes noted for other species such as the northern goshawk, great gray owl, marten, and those needed by a female fisher, as established in the Southern Sierra Nevada Fisher and Marten study. A smaller cumulative effects analysis area was established for the Greenhorn Mountain slender salamander and the mountain yellow-legged frog based on documented home range sizes. In this instance the 7th field sub-watershed (8HG) was chosen, which encompasses Long Meadow.

Criteria for assessing cumulative effects would be similar discussed under direct and indirect effects. See the above section for discussion.

Table 2. Species specific cumulative effects (CE) area in acres

Species Name	CE Analysis Area extent considered	CE Analysis Area in Acres	Estimated Suitable Habitat (Acres) or stream miles available within CE Analysis Area	Total suitable habitat acres or stream miles altered during Long Meadow Restoration work.	Total habitat remaining in Cumulative Effects analysis area 3-5 years post project
California Spotted Owl	1.5 mile radius buffer from project area center	4,520	3,065 Acres	<1.0	3,065
Northern Goshawk		4,520	3,065 Acres	<1.0	3,065
Great Gray Owl		4,520	1,600 Acres	3.0	1,600
Fisher		4,520	2,120 Acres	<1.0	2,120
Marten		4,520	1,562 Acres	<1.0	1,562
Greenhorn Mtn Slender Salamander	Long Meadow - 7th field sub-watershed	2,420	417 Acres	3.0	417
Mountain Yellow Legged Frog		2,420	4.9 Miles	0.062 miles or 325’	4.9

Past Forest Service Actions

Vegetation and Fuels Reduction Actions - No vegetation or fuels reduction projects have occurred in any of the cumulative effects analysis areas since the last mapping update completed in 2008.

Wildfires - The “Giant Wildfire” occurred in the Long Meadow Grove in 2011 and affected approximately 25 acres immediately adjacent to the Trail of 100 Giants on the west side of the grove. The wildfire occurred during summer months but burned at relatively low intensity overall, due to the extended and wet winter observed in 2011. Moist site conditions favored the retention of large woody debris and large trees, resulting in limited alteration in canopy cover from what existed. Some individual tree torching occurred where shrubs were dry resulting in higher flame lengths. Tree mortality associated with torching however was minimal with little to no impact on available habitats.

Recreation Use - Recreation facilities within Long Meadow Grove include a day use area, a campground, and the Trail of 100 Giants loop trail. The collective area has high recreation use by the public during the summer months with an estimated 5,000 visitors recorded on peak weekends such as Memorial Day, July 4th, and Labor Day. Ongoing recreation activities have likely increased levels of noise disturbance and may impact habitat to minimal degrees along the Trail of 100 Giants loop, Long Meadow Campground, and at Redwood Campground. The majority of recreation visitors stay on or near the trail loop. The species that occupy the grove (California spotted owl and northern goshawk) have continued to occupy the same general area over the last 10 years, despite ongoing recreation use. Surveys continue to show these pairs are reproducing, suggesting that they are able to tolerate current recreation levels. Impacts to stream environments have remained low since most users follow guidelines to stay on the trail. Therefore, impacts

to riparian habitat and aquatic related species such as the greenhorn slender salamander or mountain yellow legged from recreation use are non-existent.

Livestock Grazing - The Summit Allotment encompasses an estimated 28,500 acres and overlaps with the Long Meadow Restoration Project area. The Long Meadow restoration site is located within a fenced horse pasture that is used incidentally by the permittee (2-5 times annually), but is not grazed by cattle. The grazing season extends from July 1 through September 15th. Livestock grazing has been a past and ongoing activity within Sequoia National Forest, and is presently at substantially lower levels than what historically occurred. Livestock have the potential to result in some localized decreases in habitat quality and could impact habitat for the great gray owl, Greenhorn Mountain slender salamander, and the mountain yellow-legged frog. Grazing use adheres to Forest Standards and Guidelines which are monitored annually for compliance. Use of appropriate BMPs for natural resource protection, and utilization standards are enforced to maintain adequate forage and shrub cover for the species considered and their prey. It is estimated that grass height range from 8-12" post grazing season which would provide adequate cover and forage for voles and other prey species as noted in research literature. Cattle grazing would occur during time periods when the greenhorn slender salamander generally remains subsurface. During this time period, it remains under hiding cover such under logs and rocks, limiting the potential for direct mortality from livestock. Adequate provisions are in place as previously discussed for maintenance of riparian environments under terms and conditions of grazing permits which benefit conditions for aquatic species of concern.

Reasonably Foreseeable Actions

During the summer of 2011 a large redwood fell on to the Trail of 100 Giants which no longer allowed recreation users to follow the loop trail. There was some evidence of recreationalists cross cutting through the forest to be able to continue the trail walk. The trail is being repaired in 2013 which will eliminate the need for the public to circumvent the trail. Provisions were incorporated to implement appropriate Limited Operating Periods for sensitive species to decrease conflicts and disturbance during the breeding season. Therefore, these actions in conjunction with the Long Meadow Restoration Project should have little to no impact on the northern goshawk and California spotted owl PACs present in the grove.

Northern Goshawk, California Spotted Owl, Great Gray Owl, Marten and Fisher

In summary, based on the past, present and reasonably foreseeable actions documented, the proposed action as described, is not anticipated to contribute a measurable cumulative effect on the species addressed or their habitats.

Greenhorn Mountain Slender Salamander and Mountain Yellow-legged Frog

In summary, based on the past, present and reasonably foreseeable actions documented, the proposed action as described, is not anticipated to contribute a measurable cumulative effect on the species addressed or their habitats.

DETERMINATION

The Long Meadow Restoration Project would not degrade habitat for the species considered. Selective removal of some small trees may occur along a small segment of the meadow fringe for access but would not contribute measurable decreases in habitat suitability. Expected habitat alteration would have no realized impact on the availability of large live trees, overhead canopy closure, or woody debris. Restoration activities are not anticipated to dramatically increase noise disturbance levels above ambient conditions, and

would occur after critical phases of the reproductive season. The project location lies beyond the typical LOP distance applied to existing PACs rendering little to no effect. No detections of the mountain yellow-legged frog or the Greenhorn Mountain slender salamander have been noted through contemporary surveys. Preventative measures have been included to further eliminate risk to any undetected individuals by conducting an additional survey just prior to implementation. Appropriate measures have been included to protect aquatic habitat resources, with the end result of the project improving habitat stability overtime.

Based on the information presented and accompanying design features incorporated, it is my determination that the Long Meadow Restoration Project "May affect individuals but is not likely to result in a trend toward Federal listing or loss of viability for the California spotted owl, northern goshawk, great gray owl, Pacific fisher, American marten, Greenhorn Mountain slender salamander or the mountain yellow-legged frog.

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Map 1 – Long Meadow Restoration Vicinity Map

Appendix A: Species at risk: Sequoia National Forest

Table 1 reflects all wildlife and aquatic related species that are documented through a search of the USFWS web site (http://www.fws.gov/sacramento/es/spp_lists/NFFormPage.htm) for the Sequoia National Forest within Tulare County. The species list generated from the web site is extensive and searches a broader geographic area beyond Sequoia National Forest on a quad map basis. Since they are part of the list that is generated they are addressed here to meet the provisions under the ESA. Rationale for exclusion from detailed analysis is provided. All species in Appendix A were given a determination of No Effect.

Table 1. Threatened, Endangered, & Proposed Species, Sequoia National Forest

Species list for Sequoia National Forest, updated via FWS web site (http://www.fws.gov/sacramento/es/spp_lists/NFFormPage.htm) validated 1/2012

Common Name *Scientific Name*	Species Status	Habitat /Range	Rationale for exclusion from the need for detailed analysis and finding of No Affect	Detailed consideration in BA/BE
MAMMALS				
Tipton kangaroo rat *Dipodomys nitratoides*	FE	Alkali sinks and valley floor habitat. SQF outside historical, known and expected range. <1,000'	Project area outside species range	No
California bighorn sheep *Ovis canadensis californiana*	FE	Rugged mountain areas, mostly eastern Sierra with small historic range on western edge of Kern Drainage. Historic range included Golden Trout Wilderness on Western Divide Ranger District. No current, verified sightings since 1940's. > 5,000'.	Project area outside species range	No
San Joaquin kit fox *Vulpes macrotis mutica*	FE	Valley floor annual grassland, alkali washes. Outside historical, known and expected range. +/- < 1,000'	Project area outside species range	No
Giant kangaroo rat (Dipodomys ingens)	FE		Found only in Fresno, Madera and Kings County.Project area outside species range	No
Fresno kangaroo rat (Dipodomys nitratoides exilis)	FE		Found only in Fresno, Madera and Kings County. Project area outside species range	No
BIRDS				
SW Willow flycatcher *Empidonax traillii extimus*	FE	Riparian forest and meadow with dense willow habitat and standing water. Reproduction and habitat only known at Lake Isabella. Kern River Ranger District. < 6,000'	Suitable habitat on Forest, not affected by project. No designated Critical habitat in project area.	No
California condor *Gymnogyps californianus*	FE, CH	Mountain and foothill rangeland and forest habitats; nests primarily on cliff ledges but occasionally in large redwoods. Designated critical habitat (120 acres) on the Forest, along with one nest and several popular roost areas (all west slope Greenhorn Mountains). No recorded roost or nest sites documented in project area.	No prior use of Long Meadow Grove, No impacts to Giant Sequoia trees. Project area outside of west slope high use areas and does not contain critical habitat	No
Least Bell's vireo *Vireo bellii pusillus*	FE	Riparian forest. Historic to Kern Valley, detections in 2002 limited to South Fork Wildlife Area at Lake Isabella. One singing male heard no further detections. < 3,000'	No suitable habitat	No
REPTILES				
Blunt-nosed leopard lizard *Gambelia silius*	FE	Open grassland, valley floor. < 1,000'. SQF Outside historical, known and expected range	Project outside species range.	No
Giant garter snake *Thamnophis gigas*	FT	Valley floor aquatic habitats, < 1,000'. SQF Outside historical, known and expected range	Project outside species range	No
AMPHIBIANS				
California red-legged frog *Rana aurora draytoni*	FT	Low gradient streams and ponds with emergent vegetation, < 5,000'. SQF is outside known, historical and expected range.	Project outside species range	No

Table 1. Threatened, Endangered, & Proposed Species, Sequoia National Forest

Species list for Sequoia National Forest, updated via FWS web site (http://www.fws.gov/sacramento/es/spp_lists/NFFormPage.htm) validated 1/2012

Common Name *Scientific Name*	Species Status	Habitat /Range	Rationale for exclusion from the need for detailed analysis and finding of No Affect	Detailed consideration in BA/BE
California tiger salamander *Ambystoma califoriense*	FT	Annual grass habitat and grassy understory of valley-foothill hardwoods. Spend most of the year in underground in burrows of ground squirrels and man-made structures, during breeding can us rocks and logs. Breed in vernal pools, some human-made ponds w/o fish, not in streams. <1,000'.	Project outside species range	No
FISH				
Delta smelt *Hypomesus transpacificus*	FT	Limited to San Joaquin/Sacramento delta. SQF does not have an outlet to Delta.	Outside range.	No.
Little Kern golden trout *Oncorhynchus mykiss whitei*	FT, CH	Native to cold water streams in Little Kern River Drainage, 4,000' – 9,000'. Critical habitat designated on Forest within Little Kern River Basin.	Project outside of species range. No designated Critical habitat in project area.	No.
Sacramento split-tail *Pogonichthys macrolepidotus*	FT	Limited to San Joaquin/Sacramento delta	Project outside species range.	No.
INVERTEBRATES				
Vernal pool fairy shrimp *Branhinecta lynchi*	FT	Valley floor annual grassland, vernal pools, +/- < 1,000'. SQF does not contain any designated Critical habitat identified by USFWS.	Project location outside species range.	No.
Vernal pool tadpole shrimp *Lepidurus packardi*	FE	Central valley floor, ephemeral freshwater habitat, from Visalia Ca, north to Redding Ca. . SQF does not contain any designated Critical habitat identified by USFWS	Project location outside species range	No
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT	Elderberry plants with base > 1" diameter in chaparral and riparian habitats, < 2,900'. Potential habitat exists on all Districts at low elevations. No designated Critical habitat on Forest.	Project above elevation range associated with the species.	No
Kern primrose sphinx moth *Euproserpinus euterpe*	FT	Valley foothill, oak woodland and chaparral associated with evening primrose. Range limited to Walker Basin area, <5,000'. SQF outside historical and known range	Outside species range	No.
FE = Federally Endangered; FT = Federally Threatened; PT = Proposed for Federal listing; CH = Designated Critical Habitat on species list for Forest				

Table 2 identifies wildlife species found on the Region 5 sensitive species list. A No Effect determination has been issued for all species not addressed in detail.

Appendix A, Table 2. Forest Service Sensitive Animals, Sequoia National Forest (SQF) (last revision October 15, 2007).

Common Name Scientific Name	Species Status	Habitat/ Range	Rationale for exclusion from the need for detailed analysis and finding of No Affect	Detailed consideration in BA/BE
MAMMALS				
Pallid bat *Antrozous pallidus*	FS, CSC	Found in arid deserts, juniper woodlands, sagebrush shrub-steppe, and grasslands, often with rocky outcrops and water nearby. Less abundant in evergreen and mixed conifer woodlands, Typically roost in rock crevices or buildings, less often in caves, tree hollows, under bridges, and in abandoned mines, generally below 6,000 feet.	Project area above elevation range typically associated with this species.	No

Common Name Scientific Name	Species Status	Habitat/ Range	Rationale for exclusion from the need for detailed analysis and finding of No Affect	Detailed consideration in BA/BE
Townsend's. big eared bat *Corynorhinus townsendii townsendii*	FS, CSC	Nocturnal, maternity and day roosts highly associated with the use of caves or mines. May forage over a wide variety of habitats although usually mesic areas for foraging. Typically found in low to mid-elevation montane habitats. Historic occurrence while documented on the Forest has been limited to natural caves and mines along the lower Kern River Canyon and a few similar sites found on the Hume Lake District.	No cave or mine habitat within the Frog project area that could serve as an attractant for roosting or maternal bat colonies.	No
Western red bat *Lasiurus blossevillii*	FS, CSC	Associated with riparian habitat, roosts in trees and forages over open woodlands and grasslands. Requires water and open areas for foraging, usually below 3,000 feet. Scattered occurrences on Forest in low elevation areas.	Project area above elevation range associated with species.	No
American marten *Martes americana*	FS, CSC	Dense forest (>30% canopy cover), high number of large snags and down logs, close proximity to dense riparian corridors for movement, and an interspersion of small (<1 acre) openings with good ground cover for foraging. Potential occupied elevation 4,000-13,000 ft. Suitable habitat in project area	N/A	Yes
Pacific fisher *Martes pennanti pacifica*	FS, FC	Dense forest (>40% canopy cover). High number of large snags and down logs, close proximity to dense riparian corridors for movement, and an interspersion of small (<1 acre) openings with good ground cover for foraging. Potential occupied elevation 3,500-8,000 ft. Suitable habitat in project area	N/A	Yes
Sierra Nevada red fox *Vulpes vulpes necator*	FS, ST	Appears to prefer red fir and lodgepole forests in sub alpine and alpine zone. Forages in meadows & riparian zones. Mostly above 7,000'. Most current detections limited the Lassen NF, with one recent detection noted on Humboldt Toyiabe NF (East slope Sierra Nevada). No confirmed historical reports on Sequoia National Forest, and no detections have been recorded in Forest surveys. No detection through Region 5 long term monitoring surveys for forest carnivores (Sequoia and Sierra National Forest) using track plate and camera.	Project outside current estimated range	No
California wolverine *Gulo gulo luteus*	FS, FC, ST, SP	Remote habitats, sensitive to human presence. 4000' to 13,000' mixed habitats. Likely present on forest in wilderness few reports since 2002. No reports or detections on the Forest from extensive monitoring surveys conducted for forest carnivores using track plate or camera.	Outside current expected range.	No
BIRDS				
Northern goshawk *Accipiter gentiles*	FS, CSC	Dense mixed conifer forest to open eastside pine, 4,000-8,000'. Found in suitable habitat across forest. Habitat and presence in project area.	N/A	Yes

Common Name Scientific Name	Species Status	Habitat/ Range	Rationale for exclusion from the need for detailed analysis and finding of No Affect	Detailed consideration in BA/BE
California spotted owl *Strix occidentalis occidentalis*	FS, CSC	Dense forest (>40% canopy closure), preference is shown for stands with ≥2 layers, but open enough to allow for observation and flying space to attack prey. Substantial amounts of dead woody debris are desirable. Present in suitable mixed conifer and low elevation oak habitats across the forest. Presence and habitat within project area.	N/A	Yes
Great gray owl *Strix nebulosa*	FS, SE	Large meadows & openings 2,500 – 9,000'. Dense forest and large snags for nest area. Current occurrence limited to Hume Lake District and north.	N/A	Yes
Little Willow flycatcher *Empidonax trailii brewsterii*	FS, SE	Meadow (15acre +) complexes with dense willow and standing water, up to 8,000'. 8 historic sites. No detections 2001-2005.	No suitable willow habitat in project area	No
W. yellow billed cuckoo *Cocczyus americanus occidentalis*	FS, FC, SE	Dense riparian forest. Limited to South Fork Wildlife Area at Lake Isabella.	Project area outside documented range. No suitable habitat in project area.	No
Bald eagle *Haliaeetus leucocephalus*	FS, SE, SP	Lakes and open water; nests on large trees. Primary areas of use include man-made reservoirs or low-lying foothill regions adjacent to the San Joaquin Valley. Lake Isabella and portions of the lower elevation areas near the Kern River are utilized in winter months.	Winter migrant. No nest or roost locations within the project area, nor availability of lake features	No
AMPHIBIANS				
Yellow blotched salamander *Ensatina escholtzii croceator*	FS, CSC	Valley foothill/hardwood habitats and conifer, moist habitats and down logs. Piutes, Breckenridge Mountains, and lower Kern Canyon 4,000-6,000'	Project outside species range	No
Foothill yellow-legged frog *Rana boylii*	FS, CSC	Low gradient streams and ponds generally below 6,000'. Historically present in most suitable habitats. Currently only 2 pop. Known, both on east side of the Kern River.	Outside elevation range.	No
Mountain yellow-legged frog *Rana muscosa*	FS, FC, CSC	4,500-12,000' aquatic habitats. Current existing populations confined to Golden Trout Wilderness. Some historic occurrences noted through portions of the Forest. No detections of MYLF found through prior surveys. Lack of suitable habitat in the project area.	Suitable habitat in project area. Lack of basking habitat and deep pools stream environments at project restoration site.	Yes
Inyo Mtn. slender salamander *Batrachoceps campi*	FS, CSC	Down logs and moist areas in desert. Known range limited to Inyo Mtns outside of SQF. 1,800- 8,600'	Project outside of range	No
Greenhorn mountain slender salamnder *Batrachoceps Alta Sierrae*	FS, CSC	Down logs and moist areas, generally in mixed conifer zone. Kern Canyon to Tule River, 560'-7,600'. Potential habitat in project area.	N/A	Yes
Relictual slender salamander Batrachoceps relictus		Down logs and moist areas, generally in mixed conifer zone. Kern Canyon south through Breckenridge and Piute Mountains.	Project outside of stated range.	No
Kern Cyn. slender salamander *Batrachoceps simatus*	FS, ST	Down logs and moist areas, below 3,500' Limited to Kern Canyon	Project area outside of species range.	No
Tehachapi slender salamander *Batrachoceps stebbensii*	FS, ST	Down logs and moist areas, below 3,500'. Limited to canyon and desert areas Tehachapi to Caliente, 2,000'-4,600'	Project outside of species range.	No

Common Name Scientific Name	Species Status	Habitat/ Range	Rationale for exclusion from the need for detailed analysis and finding of No Affect	Detailed consideration in BA/BE
Kern Plateau slender salamander *Batrachoceps sp.*	FS, CSC	Down logs and moist areas, ≈7,000-8,000'. Limited to Kern Plateau	Project outside of species range.	No
Breckenridge slender salamander *Batrachoceps sp.*	FS, CSC	Down logs and moist areas in the Breckenridge area. Known only from one location near Squirrel Mdw, Breckenridge Mtns. (Unverified Lucas Cyn)	Project outside of species range.	No
REPTILES				
Southwestern pond turtle *Clemmys marmorata pallida*	FS	Low gradient ponds and streams with basking sites. Can be found up to 1 mile from perennial water. Most common in perennial streams below 5,000 feet.	Project outside species range.	No
California legless lizard *Anniella pulchra*	FS	Loose, moist soil in chaparral and valley foothill woodland below 6,000'. Limited detections on forest presumed present in suitable habitat	Project outside elevation range.	No
Sierra night lizard *(Xantusia vigilis sierrae)*	FS	Annual grasslands. Not known outside of limited range near Granite Station.	Outside known range, surveys have not detected species in this area	No
FISH				
Hardhead *(Mylopharodon conocephalus)*	FS, CSC	Warm water rivers at low elevation	No suitable habitat in project area	No
Volunteer Creek (California) golden trout *(Oncorhynchus mykiss aguabonita)*	FS, CSC	Cold water streams. Genetic purity questionable in many streams. SF Kern River and Tributaries above Rockhouse basin.	Outside range, no suitable habitat.	No
Status Key: FC - USFWS Candidate	CSC - CA Species of Special Concern SP - State Fully Protected	SE - State Endangered ST - State Threatened	FS - USFS Sensitive Species	

Appendix B

Photo 1 – Gully extent as a result of the active headcut and its upstream migration from base of meadow.

Photo 2- Close up view of a portion of the headcut looking upstream.