Mr. Kevin B. Elliott
Forest Supervisor
Sequoia National Forest
Giant Sequoia National Monument
1839 South Newcomb Street
Porterville, California 93257

Subject: Biological Opinion for the Giant Sequoia National Monument Management Plan, Fresno, Tulare, and Kern Counties, California

Dear Mr. Elliott:

This is in response to your April 27, 2012, request to initiate formal consultation with the U.S. Fish and Wildlife Service (Service) on the Forest Service’s selection of alternative B of the Giant Sequoia National Monument Management Plan (Monument Plan) Final Environmental Impact Statement. The Monument Plan amends the 1988 Sequoia National Forest Land and Resource Management Plan for the portion of the National Forest that is in the Giant Sequoia National Monument (Monument) and is intended to provide guidance for management of the Monument for the next 10 to 15 years. At issue are the potential effects of the action on the federally-endangered California condor (Gymnogyps californianus) and its designated critical habitat, the threatened valley elderberry longhorn beetle (Desmocerus californicus dimorphus) (beetle), Little Kern golden trout (Onchorhynchus mykiss whitei) and its designated critical habitat, Springville clarkia (Clarkia springvillensis), and fisher (Martes pennanti), a candidate species. Your request was received by our office on April 30, 2012. This response is provided under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act).

On January 11, 2001, we issued a programmatic biological opinion (Service file 1-1-01-F-33) on the implementation of the Sierra Nevada Forest Plan Amendment. The Sierra Nevada Forest Plan Amendment was intended to provide guidance and management direction for 11 National Forests in the Sierra Nevada. Subsequent to our issuance of the 2001 opinion, the Forest Service revised the 2001 Forest Plan Amendment and we issued a December 11, 2003 biological opinion on the Sierra Nevada Forest Plan Amendment Supplemental Environmental Impact Statement (Service file 1-1-03-F-2638). Our 2003 biological opinion addressed changes to the Sierra
Nevada Forest Plan Amendment and provided a programmatic analysis of the potential effects the implementation of standards and guidelines may have on federally-listed species. While it is our understanding that the proposed Monument Plan adheres to the standards and guidelines previously addressed in our 2001 and 2003 biological opinions, due to the scope of the previous opinions consisting of the entire Sierra Nevada, and the current action containing select components of both previous actions, it is necessary to reanalyze to potential effects at the Monument Plan level focusing on the new combination of various standards and guidelines.

Due to the Monument Plan only providing a context for decision making and not the implementation of specific projects and activities, we have taken an approach at assessing the potential effects of the proposed Monument Plan implementation Monument-wide in an attempt to quantify and qualify the effects of the proposed action. This response addresses the potential effect of the implementation of the Monument Plan as it relates to the standards and guidelines, and the Monument Plan direction as it relates to potential effects to federally-listed species. Our response does not cover future site-specific actions resulting from the proposed action, nor does it authorize incidental take for programmatic impacts associated with ongoing effects of programs administered by the Forest Service.

In light of the general nature of the Monument Plan, the following assumptions regarding future consultation are incorporated into our response:

1. Analysis for site specific actions proposed under the direction of the Monument Plan that may affect federally-listed species will be submitted to the Fish and Wildlife Service pursuant to section 7 of the Endangered Species Act.

2. Specific actions that the Forest Service determine may affect listed species will undergo consultation according to section 7(a)(2) of the Act. These actions will be assessed on their own merits and be evaluated relative to the jeopardy and adverse modification criteria of the Act.

3. Our response in this letter and the accompanying biological opinion is based on the management strategy presented in the project description of the Biological Assessment, Final Environmental Impact Statement and Record of Decision. Therefore, the Service will provide guidance on future proposed actions and their consistency with the project description and our response, in order to ensure that our current determination remains valid.

4. The condition, abundance, and distribution of listed and unlisted species and/or their habitat described in these documents is accurately described and will not substantially change from the conditions currently analyzed. Circumstances may occur that result in effects not considered (e.g listing of a new species or discovery of new or previously unknown populations of listed species in areas where they may be affected by the proposed action). In such event, reinitiation of consultation for listed species may be necessary pursuant to 50 CFR 402.16.

5. The effects of actions resulting from the implementation of the Monument Plan may
require future programmatic and/or site specific section 7 consultations for the listed species addressed in this response. The accompanying biological opinion does not issue exemption for any incidental take caused by any action funded, authorized or carried out by the Forest Service.

California Condor

California condors are known to have historically nested within the Monument and have recently been documented to briefly utilize portions of the Monument, presumably for foraging. The Monument contains several provisions that will reduce the potential effects of the plan implementation on the California condor. Specifically the Forest Service will limit the size of trees that could be removed under the plan to those less than 20 inches diameter breast height (dbh), thereby retaining large trees that may be used for nesting condor. Additionally, the Forest Service will continue to implement site specific management plans for the historic nesting areas which limit activities within these areas and prescribes closures if nesting condors are discovered. As a result of specific management for condor, size class limitations on tree removal, maintenance of important habitat types, and condors not typically utilizing the Monument, we consider the potential effects to be insignificant and/or discountable. Therefore we concur with your determination that the proposed Monument Plan is not likely to adversely affect California condor.

The Monument planning area contains approximately 650 acres of designated critical habitat for California condor. The critical habitat within the Monument is located within the wildland-urban interface and therefore is considered a high priority for fuels treatment. The critical habitat unit on the Monument consists primarily of a blue oak woodland vegetation type. Given that the portion of critical habitat within the Monument would likely only be used by condor as a foraging area, fuels treatment activities within this location would continue to maintain the necessary physical or biological features for condor that are currently present. Therefore we concur with your determination that the proposed Monument Plan is not likely to adversely affect California condor designated critical habitat.

Little Kern Golden Trout

The Monument contains approximately 5.4 miles of streams that are potentially occupied by Little Kern golden trout, as well as approximately 4,582 acres of designated critical habitat for Little Kern Golden trout. Based on our review of the standards and guidelines as they apply to activities that are likely to adversely affect this species, our concern is limited to the potential effects of grazing. The proposed grazing standards and guidelines are likely to result in adverse effects of this species. The Service previously issued a biological opinion analyzing the effects of the Little Kern grazing allotment on the Little Kern golden trout and its designated critical habitat (Service file 1-1-94-F-26). Because the current Monument Plan includes the same standards and guidelines addressed in our previous biological opinion, as well as incorporates some of the opinion’s terms and conditions, and the previously-issued a biological opinion addressed the site specific effects of the grazing on Little Kern golden trout and its designated critical habitat, it is not necessary to reanalyze the potential effects in the context of the current
Springville Clarkia

Springville clarkia has been documented in several locations within the Monument. Two active grazing allotments within the Monument are known to contain populations of this listed plant, with past documentation of cattle affecting Springville clarkia. However, within both grazing allotments, all locations of Springville clarkia have been fenced to exclude cattle, thereby alleviating the potential effect of cattle grazing. Of remaining concern is the potential for activities conducted under the Monument Plan to introduce or facilitate the spread of noxious weeds, as well as direct effects related to vegetation management. Standards and guidelines related to noxious weeds and weed control; the implementation of a noxious weed program; and the requirement to conduct surveys in order to flag and avoid occupied locations prior to vegetation management activities reduces the potential effects to levels that are insignificant and/or discountable. Therefore we concur with your determination that the proposed Monument Plan is not likely to adversely affect Springville clarkia.

Valley Elderberry Longhorn Beetle/Fisher

Based on our review of the information provided, we do not concur with your determination that the proposed Monument Plan is not likely to adversely affect the valley elderberry longhorn beetle. Therefore, this document represents the Service’s biological opinion on the effects of the Monument Plan implementation on the valley elderberry longhorn beetle. Additionally, our analysis of the Monument Plan as it relates to fisher is included in the Conservation Recommendations section of this document. The following sources of information were used to develop this biological opinion: (1) the April 25, 2012 Giant Sequoia National Monument Wildlife Biological Assessment; (2) the August 2012, Giant Sequoia National Monument Management Plan; (3) the August 2012, Giant Sequoia National Monument Final Environmental Impact Statement; (4) the August 2012, Giant Sequoia National Monument Record of Decision; (5) electronic communications between the Forest Service and the Service; and (6) other information available to the Service.

Consultation History

June 15, 2010: Meeting between the Service and the Forest Service to review maps and discuss the proposed Monument Plan.

August 11, 2010: Meeting between the Service and the Forest Service to discuss changes to the Monument Plan. Service received the Draft Management Plan and Draft Environmental Impact Statement.

January 2011: The Service provided the Forest Service with comments on the Draft Biological Assessment and Draft Environmental Impact Statement.
April 30, 2012: The Service received the Biological Assessment and request for consultation.

August 8, 2012: The Forest Service signed the Giant Sequoia National Monument Record of Decision.


BIOLOGICAL OPINION

Description of the Action

The Forest Service is proposing to implement a Monument Plan which provides the strategic direction at a broad program level for the management of the Monument over a ten to fifteen year period. The Monument Plan is intended to replace all previous management direction for the approximately 327,000 acres of National Forest system lands. The Monument Plan provides a context for decision making, while guiding resource management programs, practices, uses, and projects. Additionally, the Monument Plan provides the framework for the development and analysis of resource management activities in future site-specific projects to move resource toward the desired conditions for the Monument. Specifically, the desired conditions include managing the habitats of rare and endemic species so that lands within the Monument continue to provide diversity with a special focus on riparian areas, montane meadows, and late successional forests. Since the Monument Plan provides the framework for the implementation of future projects or activities, it does not include any decisions on specific projects and activities.

The Monument contains a wide variety of habitat types including mixed conifer (including giant sequoia groves), red fir, oak woodland, montane and mixed chaparral, wet meadow, riparian, annual grassland, and rock outcrop. As such, the Monument Plan provides a variety of direction for the enhancement or maintenance of proper hydrologic and ecologically functioning conditions in riparian areas and meadows as well as an emphasis on the maintenance and/or enhancement of old forest habitat in suitable quality, quantity, and distribution to support viable populations of late-successional dependent species. The Monument Plan was developed based on Alternative B of the Giant Sequoia National Monument Final Environmental Impact Statement to identify the changes to current management direction needed to comply with the proclamation designating it as a National Monument. The Monument Plan includes multiple tools for decreasing fuel buildups and reducing the risk of uncharacteristically large-scale wildfire. The specific components of the Monument Plan include the following:
1. Promotion of Resiliency

The Monument Plan is intended to promote resilient vegetation communities (those able to recover quickly from wildfire) through the use of prescribed fire, mechanical treatment, and managed wildfire (when available), in order of priority. Vegetation management projects for ecological restoration and maintenance would consider using prescribed fire first and be focused in the wildland-urban interface defense and threat zones, with diameter limits throughout the Monument. Alternative B allows tree cutting for fuels management and ecological restoration. No trees with a diameter greater than 20 inches dbh may be cut, except for safety issues.

2. Promotion of Heterogeneity

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

3. Recreation Opportunities

The Monument Plan would continue to provide current recreation opportunities, including dispersed camping, developed camping, and the use of off-highway vehicles on designated roads with a focus on the development of new recreation facilities or opportunities as visitor use increases.

4. Vegetation, Including Giant Sequoia Groves

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

5. Fire and Fuels

The Monument Plan uses a wildland-urban interface defense zone that extends approximately one-quarter mile from developed private land, and a wildland-urban interface threat zone that extends another one and one quarter mile from the defense zone. Designated wildland-urban interface defense zones covers 45,342 acres (13 percent) of the Monument and threat zones 145,522 acres (41 percent) of the Monument. The Monument Plan includes the 56,591 acre tribal fuels emphasis treatment area. The tribal fuels emphasis treatment area was developed in response to discussions with the Tule River Indian Tribe and the concern over fires spreading to tribal lands. The Tribal Forest Protection Act of 2004 authorizes the Forest Service to enter into an agreement with Indian tribes meeting certain criteria to carry out projects to protect Indian forest land. This land allocation was designed along the
boundary of the Tule River Indian Reservation to not only protect the reservation and its watersheds, but also the objects of interest and watersheds in the Monument, from fires spreading from one to the other.

6. Wildlife and Plant Habitat

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

7. Range

In adopting the Monument Plan, standards and guidelines for livestock grazing from the 2004 Sierra Nevada Forest Plan Amendment would replace the 2001 Sierra Nevada Forest Plan Amendment direction. Some management direction from the 1988 Forest Plan and 1990 Mediated Settlement Agreement would be used.

8. Hydrological Resources

The Monument Plan replaces the strategies, objectives, and standards and guidelines for the riparian conservation objectives from the 2001 Sierra Nevada Forest Plan Amendment with management direction based on the 2004 Sierra Nevada Forest Plan Amendment. The 2004 Sierra Nevada Forest Plan Amendment reduces redundancy and describes more consistent direction for hydrological resources, while maintaining the intent of the Aquatic Management Strategy.

9. Transportation

Under the Monument Plan Alternative B, the majority of the currently designated road and trail system would be available for use, retaining access similar to current levels for dispersed recreation, private ownerships, and management activities. There would be the potential for some reduction in high-clearance vehicle roads over time. Off-highway vehicles would be allowed on designated roads. Over-snow vehicles would be allowed on designated roads when covered with snow, unless specifically prohibited. Non-motorized mechanized vehicles (mountain bikes) would be allowed on designated roads and trails unless specifically prohibited. The Monument Plan emphasizes opportunities for creating loop trails and roads, with the potential for the construction of new roads for developed recreation facilities and loop driving opportunities. Decommissioned roads could be converted to trails.

10. Ecological Restoration and Wildlife

Ecological restoration for wildlife is defined as a reestablishment of natural functions and
processes in the Monument that provide a diverse range of high quality habitats. Priority areas for restoration are those sites which were modified from their natural state by fire suppression, logging, unmanaged grazing, adverse changes in hydrology and historic development. The goal of management of wildlife habitat is to return human-disturbed areas to the natural conditions and processes characteristic of the ecological zone in which the damaged resources are situated. Ultimately, restored areas would be maintained as valuable wildlife habitat through natural processes, with little human management required. These restored areas could then contribute to the maintenance of viable populations of animal species in Giant Sequoia National Monument.

Restoration efforts may include:
  a. Return of a natural fire regime
  b. Removal of exotic species
  c. Restoration of abandoned unneeded roads, areas over-grazed by domestic animals, or disrupted natural waterways
  d. Restoration of areas disturbed by management activities or by public use (such as construction or off highway vehicle damage)
  e. Restoration of native plants and animals

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

Conservation Measures

The Monument Plan does not provide specific conservation measures to reduce potential effects to the valley elderberry longhorn beetle. However, the special management considerations for riparian conservation areas and critical aquatic refuges provide for some conservation of the valley elderberry longhorn beetle. Riparian conservation areas and critical aquatic refuges are land allocations with activity-related standards and guidelines aimed at maintaining species viability. Within these land allocations, the 2004 Sierra Nevada Forest Plan Amendment guidelines would be followed to assess the impacts of management activities, require that Best Management Practices are followed in order to minimize adverse effects and maintain habitat for riparian dependent species including valley elderberry longhorn beetle.

Standard and Guidelines for riparian conservation areas and critical aquatic refuges include:

1. Limit browsing to no more than 20 percent of the annual leader growth of mature riparian shrubs (including willow and aspen) and no more than 20 percent of individual seedlings.
Remove livestock from any area of an allotment when browsing indicates a change in livestock preference from grazing herbaceous vegetation to browsing woody riparian vegetation.

2. Evaluate new proposed management activities within critical aquatic refuges and riparian conservation areas during environmental analysis to determine consistency with the riparian conservation objectives at the project level and the aquatic management strategy goals for the landscape. Ensure that appropriate mitigation measures are enacted to: (1) minimize the risk of activity-related sediment entering aquatic systems; and (2) minimize impacts to habitat for aquatic or riparian dependent plant and animal species.

3. Within critical aquatic refuges, in occupied habitat or "essential habitat" as identified in conservation assessments for threatened, endangered, or sensitive species, evaluate the appropriate role, timing, and extent of prescribed fire. Avoid direct lighting within riparian vegetation; prescribed fires may back into riparian vegetation area. Develop mitigation measures to avoid impacts to these species whenever ground-disturbing equipment is used.

4. Design prescribed fire treatments to minimize disturbance of ground cover and riparian vegetation in riparian conservation areas. In burn plans for project areas that include or are adjacent to riparian conservation areas, identify mitigation measures to minimize the spread of fire into riparian vegetation. In determining mitigation measures, weigh the potential harm of mitigation measures (e.g. firelines) against the risks and benefits of prescribed fire entering riparian vegetation. Strategies should recognize the role of fire in ecosystem function and identify those instances when fire suppression or fuel management actions could be damaging to habitat or the long-term function of a riparian community.

**Action Area**

The action area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The Monument includes approximately 327,000 acres of National Forest system lands (encompasses 354,000 acres including private land) located in the southern Sierra Nevada on the Sequoia National Forest, in Fresno and Tulare Counties and a small portion of Kern County, California.

The Monument is situated approximately 37 miles south of Yosemite National Park, directly west and south of Sequoia and Kings Canyon National Parks, approximately 45 miles east of Fresno and 20 miles east of Porterville. For the purposes of the effects assessment, the action area encompasses the approximately 354,000 acre administrative boundary of the Giant Sequoia National Monument.

**Analytical Framework for the Jeopardy Analysis**

In accordance with policy and regulation, the jeopardy analysis in this biological opinion is
based on on four components: (1) the Status of the Species, which evaluates the valley elderberry beetle’s range-wide condition, the factors responsible for that condition, and its survival and recovery needs; (2) the Environmental Baseline, which evaluates the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the listed species; (3) the Effects of the Action, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the valley elderberry beetle and (4) Cumulative Effects, which evaluates the effects of future, non-Federal activities in the action area on the valley elderberry longhorn beetle.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the valley elderberry beetle’s current status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the species in the wild.

The jeopardy analysis in this biological opinion places an emphasis on consideration of the range-wide survival and recovery needs of the valley elderberry beetle and the role of the action area in the survival and recovery of the valley elderberry beetle as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Status of the Species

On August 8, 1980, the valley elderberry longhorn beetle was listed as a threatened species (45 FR 52803) (USFWS 1980). Critical habitat for this species was designated and published at 50 CFR §17.95. Two areas along the American River in the Sacramento metropolitan area have been designated as critical habitat for the beetle. These designated areas of critical habitat are the American River Parkway Zone, an area along the lower American River at Goethe and Ancil Hoffman Parks, and the Sacramento Zone, an area located approximately one-half-mile from the American River downstream from the American River Parkway Zone. In addition, an area along Putah Creek, Solano County, and the area east of Nimbus Dam along the American River Parkway, Sacramento County, are considered essential habitat, according to the Valley Elderberry Longhorn Beetle Recovery Plan (USFWS 1984). These critical and essential habitat areas support large numbers of mature elderberry shrubs with extensive evidence of use by the beetle.

Life History

The beetle is dependent on its host plant, the elderberry (Sambucus species), which is a locally common component of the remaining riparian forests and savannah areas and to a lesser extent, the mixed chaparral-foothill woodlands of the Central Valley. The occupancy rates of the beetle are reduced in non-riparian habitats (e.g., Talley et al. 2007), indicating that riparian elderberry habitat is an important habitat type for the beetle. Each stage of the beetle’s life cycle requires a different part of the elderberry shrub. The adults feed on the nectaries, flowers, and leaves.
Gravid females lay eggs on leaves and in crevices of green stems (Barr 1991) and larvae feed down the pith of a healthy stem into the larger living branches (Halstead and Oldham 2000).

Use of elderberry shrubs by the beetle, a wood borer, is rarely apparent. Frequently, the only exterior evidence of the shrub's use by the beetle is an exit hole created by the larva just prior to the pupal stage. Observations of elderberry shrubs along the Cosumnes River and in the Folsom Lake area indicate that larval beetles may be present in elderberry shrubs with no evidence of exit holes; the larvae either succumb prior to constructing an exit hole or are not developed sufficiently to construct one. Larvae appear to be distributed in stems which are 1.0 inch or greater in diameter at ground level. The Valley Elderberry Longhorn Beetle Recovery Plan (USFWS 1984) and Barr (1991) further describe the beetle's life history.

**Population Structure**

The beetle is a specialist on elderberry shrubs, tends to have small population sizes, and occur in low densities (Barr 1991; Collinge *et al.* 2001). It has been observed feeding upon both blue and red elderberry (USFWS 1984, Barr 1991) with stems greater than or equal to one inch in diameter (Barr 1991). Sightings of the beetle are rare and in most circumstances, evidence of the beetle is derived from the presence of exit holes left in the elderberry stems by the beetle larva. The beetle tends to occur in areas with higher elderberry densities, but has lower exit-hole densities than a closely related species, the California elderberry longhorn beetle (*Desmocerus californicus californicus*) (Collinge *et al.* 2001).

**Distribution and Range**

When the beetle was listed as threatened in 1980, the species was known from less than ten localities along the American River, Merced River, and Putah Creek. By the time the Valley Elderberry Longhorn Beetle Recovery Plan was prepared in 1984 additional occupied localities had been found along the American River and Putah Creek. As of 2005, the California range-wide distribution extends from the Sacramento River in Shasta County southward to an area along Caliente Creek in Kern County (CNDB 2006). The California Natural Diversity Database (CNDDDB) contained 190 occurrences for the beetle in 44 drainages throughout the Central Valley. However, the number of records should be viewed with caution as a record does not necessarily indicate a unique population. In many cases, there are multiple records within close proximity to one another within the same watershed or river.

The beetle is considered a poor disperser based on the spatial distribution of occupied shrubs (Barr 1991; Collinge *et al.* 2001). Huxel and Hastings (1999) used computer simulations of colonization and extinction patterns based on differing dispersal distances, and found that the short dispersal simulations best matched the 1997 census data in terms of site occupancy. This suggests that dispersal and colonization are limited to nearby sites. At spatial scales greater than 6.2 miles, such as across drainages, beetle occupancy appears to be strongly influenced by regional extinction and colonization processes, and colonization is constrained by limited dispersal (Collinge *et al.* 2001; Huxel and Hastings 1999). Except for one occasion, drainages examined by Barr that were occupied in 1991 remained occupied in 1997 (Collinge *et al.* 2001;
Huxel and Hastings 1999). The one exception was Stony Creek, which was occupied in 1991, but not in 1997. All drainages found to be unoccupied by Barr in 1991, were also unoccupied in 1997. Collinge et al. (2001) further found that while the proportions of occupancy were similar, the number of sites examined containing elderberry and the density of elderberry at sites had decreased since Barr (1991), resulting in fewer occupied sites. Studies indicate the beetle is unable to re-colonize drainages where the species has been extirpated because of its limited dispersal ability (Barr 1991; Collinge et al. 2001), suggesting that drainages unoccupied by the beetle remain unoccupied.

Threats to the Species

The beetle continues to be threatened by habitat loss, habitat fragmentation, predation by the non-native Argentine ant (Linepithema humile) (Holway 1998; Huxel 2000; Huxel and Hastings 1999; Huxel et al. 2001; Ward 1987), and possibly other factors such as pesticide drift, non-native plant invasion, improper burning regimes, off-road vehicle use, rip-rap bank protection projects, wood cutting, and overgrazing by livestock.

Habitat Loss

Habitat destruction is one of the most significant threats to the beetle. In the final rule to list the beetle as threatened, habitat destruction was cited as the primary factor contributing to the need to list the species (45 FR 52803). Riparian forests, the primary habitat for the beetle, have been severely depleted throughout the Central Valley over the last two centuries as a result of expansive agricultural and urban development (Huxel et al. 2001; Katibah 1984; Roberts et al. 1977; Thompson 1961). As of 1849, the rivers and larger streams of the Central Valley were largely undisturbed. They supported continuous bands of riparian woodland four to five miles in width along some major drainages, and generally about two miles wide along the lesser streams (Thompson 1961). Most of the riverine floodplains supported riparian vegetation to about the 100-year flood line (Katibah 1984).

A large human population influx occurred after 1849, however, and much of the Central Valley riparian habitat was rapidly converted to agriculture and used as a wood source for fuel and construction material to serve a wide area (Thompson 1961). The clearing of riparian forests for fuel and construction material made this land available for agriculture (Thompson 1977). Natural levees bordering the rivers, once supporting vast tracts of riparian habitat, became prime agricultural land (Thompson 1961). As agriculture expanded in the Central Valley, needs for increased water supply and flood protection spurred water development and reclamation projects. Artificial levees, river channelization, dam building, water diversion, and heavy groundwater pumping further reduced riparian habitat to small, isolated fragments (Katibah 1984).

In recent decades, these riparian areas have continued to decline as a result of ongoing agricultural conversion, urban development, and stream channelization. As of 1989, there were over 100 dams within the Central Valley drainage basin, as well as thousands of miles of water delivery canals and stream bank flood control projects for municipal and industrial water
supplies, irrigation, hydroelectric power, flood control, navigation, and recreation (Frayer et al. 1989). Riparian forests in the Central Valley have dwindled to discontinuous strips that are measured in the number of yards wide rather than miles.

Some accounts state that the Sacramento Valley supported approximately 775,000 to 800,000 acres of riparian forest as of approximately 1848, just prior to statehood (Smith 1977; Katibah 1984). No comparable estimates are available for the San Joaquin Valley. Based on early soil maps, however, more than 921,000 acres of riparian habitat are believed to have been present throughout the Central Valley under pre-settlement conditions (Huxel et al. 2001; Katibah 1984). Another source estimates that of the approximately 5 million acres of wetlands in the Central Valley in the 1850s, approximately 1.6 million acres were riparian wetlands (Warner and Hendrix 1985; Frayer et al. 1989).

Based on a California Department of Fish and Wildlife (CDFW) riparian vegetation distribution map, by 1979 there were approximately 102,000 acres of riparian vegetation remaining in the Central Valley (Katibah 1984). This represents a decline in acreage of approximately 89 percent (Katibah 1984). More extreme figures were given by Frayer et al. (1989), who reported that woody riparian forests in the Central Valley had declined to 34,600 acres by the mid-1980s (from 65,400 acres in 1939).

A more recent analysis, completed by The Central Valley Historic Mapping Project, observed similar decreases in the amount of riparian habitat (Geographic Information Center 2003). Loss of riparian habitat between 1900 and 1990 was about 96 percent in the southern portion of the Central Valley (Kern County to Fresno County) (16,000 acres remaining), 84 percent in the mid-Central Valley (Merced County to San Joaquin Valley) (21,000 acres remaining) and 80 percent in the northern portion of the Central Valley (Sacramento and Solano counties to Shasta County) (96,000 acres remaining). Although these studies have different findings in terms of the number of acres lost (most likely explained by differing methodologies), they attest to a dramatic historic loss of riparian habitat in the Central Valley.

Habitat Fragmentation

Destruction of riparian habitat in central California has resulted in a significant acreage loss, but has also resulted in beetle habitat fragmentation. Fahrig (1997) states that habitat fragmentation is only important for habitats that have suffered more than an 80 percent loss. Riparian habitat in the Central Valley, which has experienced greater than 90 percent loss by most estimates, would meet this criterion as habitat vulnerable to the effects of fragmentation. Barr (1991) found that small, isolated habitat remnants were less likely to be occupied by beetles than larger patches, indicating that beetle subpopulations are extirpated from small habitat fragments. Barr (1991) and Collinge et al. (2001) consistently found beetle exit holes occurring in clumps of elderberry bushes rather than isolated bushes, suggesting that isolated shrubs do not typically provide long-term viable habitat for the beetle.

Habitat fragmentation can be an important factor contributing to species declines because: (1) it divides a large population into two or more small populations that become more vulnerable to
direct loss, inbreeding depression, genetic drift, and other problems associated with small populations; (2) it limits a species’ potential for dispersal and colonization; and (3) it makes habitat more vulnerable to outside influences by increasing the edge:interior ratio (Primack 1998).

Small, isolated subpopulations are susceptible to extirpation from random demographic, environmental, and/or genetic events (Shaffer 1981; Lande 1988; Primack 1998). While a large area may support a single large population, the smaller subpopulations that result from habitat fragmentation may not be large enough to persist over a long time period. As a population becomes smaller, it tends to lose genetic variability through genetic drift, leading to inbreeding depression and a lack of adaptive flexibility. Smaller populations also become more vulnerable to random fluctuations in reproductive and mortality rates, and are more likely to be extirpated by random environmental factors. When a sub-population becomes extinct, habitat fragmentation reduces the chance of recolonization from any remaining populations. The effect of habitat fragmentation likely is exacerbated by the poor dispersal abilities of the beetle (Collinge et al. 2001; Talley 2005).

Habitat fragmentation not only isolates small populations, but also increases the interface between habitat and urban or agricultural land, increasing negative edge effects such as the invasion of non-native species (Huxel et al. 2001; Huxel 2000) and pesticide contamination (Barr 1991). Several edge effect-related factors may be related to the decline of the beetle.

**Predation**

The invasive Argentine ant (*Linepithema humile*) is a potential threat to the beetle (Huxel 2000) because it is both an aggressive competitor and predator on native fauna. The Argentine ant is spreading throughout riparian habitats in California and displacing assemblages of native arthropods (Ward 1987; Human and Gordon 1997; Holway 1998). The Argentine ant requires moisture and it may thrive in the riparian or irrigated areas that the beetle is found. A negative association between the presence of the ant and beetle exit holes was observed along Putah Creek in 1997 (Huxel 2000). This aggressive ant could interfere with adult mating or feeding behavior, or prey on eggs and larvae (e.g., Way et al. 1992). Surveys along Putah Creek found beetle presence where Argentine ants were not present or had recently colonized, but the beetle was absent from otherwise suitable sites where Argentine ants had become well-established (Huxel 2000). Between 1998 and 2002, the number of sites infested by the Argentine ant increased by three along Putah Creek and the American River (30 sites total were examined) (Huxel 2000; Holyoak and Talley 2001). The Argentine ant has been expanding its range throughout California since its introduction around 1907, especially in riparian woodlands associated with perennial streams (Holway 1998; Ward 1987). Huxel (2000) concluded that, given the potential for Argentine ants to spread with the aid of human activities such as movement of plant nursery stock and agricultural products, this species may come to infest most drainages in the Central Valley along the valley floor, where the beetle is found.

The beetle is also likely preyed upon by insectivorous birds, lizards, and European earwigs (*Forficula auricularia*) (Klasson et al. 2005). These three predators move freely up and down
elderberry stems searching for food. The European earwig is a scavenger and omnivore that is often found feeding on tethered mealworm (*Tenebrio monitor*) larvae. The earwig may be common in riparian areas and it may lay its eggs in dead elderberry shrubs. The earwig, like the Argentine ant, requires moisture and is often found in large numbers in riparian and urban areas. Earwig presence and densities tended to be highest in mitigation sites. This is likely because of irrigation, although this needs to be statistically tested (Klasson *et al.* 2005).

*Pesticide Drift*

Direct spraying with pesticides and related pesticide drift is a potentially harmful factor for the beetle. A wide range of such spraying is done to control mosquitoes, crop diseases, and undesirable plants and insects. Although there have been no studies specifically focusing on the direct and indirect effects of pesticides on the beetle, evidence suggest that the species may be adversely affected by some pesticide applications. Commonly used pesticides within the range of the beetle include insecticides, most of which are broad-spectrum and likely toxic to the beetle; herbicides, which may harm or kill its elderberry host; and broad-spectrum pesticides toxic to many forms of life. The greatest pesticide use occurs in the San Joaquin Valley. Four counties in this region had the highest use: Fresno, Kern, Tulare, and San Joaquin (California Department of Pesticide Regulation (CDPR) 2006). The peak timing of application depends on the chemical agent and other factors, including the activity period of the targeted pest insects. The use of these agents may coincide with the most vulnerable period of adult beetle activity, egg-laying and initial larval exposure on the outside of elderberry stems (Talley *et al.* 2006). The CDPR in 1997 listed 239 pesticide active ingredients applied in proximity to locations of the beetle (same square mile per Marovich and Kishaba 1997 cited in Talley *et al.* 2006). Pesticide active ingredients sold in California have averaged in the order of 600 million pounds per year since about 1998 (CDPR 2006).

Pesticide use reported to the CDPR is only a fraction of the pesticides sold in California each year. About two-thirds of the active ingredients sold in a given year are not subject to use reporting, including home-use pesticide products. Studies of major rivers and streams documented that 96 percent of all fish, 100 percent of all surface water samples and 33 percent of major aquifers contained one or more pesticides at detectable levels (Gilliom 1999). Pesticides were identified as one of the 15 leading causes of impairment for streams included on the Clean Water Act section 303(d) lists of impaired waters. Because the beetle occurs primarily in riparian habitat, the contamination of rivers and streams likely has effects on the beetle and its habitat. Given the amount and scope of pesticide use, along with unreported household and other uses, and the proximity of agriculture to riparian vegetation in the Central Valley, it appears likely that pesticides are affecting the beetle and its elderberry habitat.

*Invasive Plant Species*

Invasive exotic plant species may significantly alter habitat for the beetle. Without adequate eradication and control measures, these non-native species may eliminate elderberry shrubs and other native plants. Pest plants of major importance in the Central Valley riparian systems include black locust (*Robinia pseudoacacia*), giant reed (*Arundo donax*), red sesbania (*Sesbania*
*punicea*, Himalaya blackberry (*Rubus armeniacus*), tree of heaven (*Ailanthus altissima*), Spanish broom (*Spartium junceum*), Russian olive (*Eleagnus angustifolia*), edible fig (*Ficus carica*), and Chinese tallowtree (*Sapium sebiferum*). Non-woody invasives such as ripgut brome (*Bromus diandrus*), foxtail barley (*Hordeum murinum*), *Lolium multiflorum*, and starthistle/knapweed (*Centaurea* spp.) also may impair elderberry germination or establishment, or elevate the risk of fire. Invasive plant control efforts often are limited by funding, labor, coordination with landowners, and the resilience and spread of their target plants. No range-wide assessment has been completed on the overall degree of impact of invasive plants on the beetle and its habitat. However, there are a number of local efforts to control invasive riparian plant species. For example, the American River Parkway has invasive species removal efforts by Sacramento Native Weed Warriors (a community stewardship project associated with the California Native Plant Society) and others, and the Cosumnes River Preserve has a group of volunteers who regularly remove exotics and restore native habitats (Talley et al. 2006).

**Other Threats**

Several other factors may threaten the beetle including fire, flooding, and over-grazing by livestock. The condition of elderberry shrubs can be adversely affected by fire, which is often common at the urban-wildland interface. Brush fires initially have a negative effect on shrub condition and, therefore, beetle larvae through direct burning and stem die-off. However, a year after a fire surviving elderberry shrubs resprout and display rapid stem growth (Crane 1989). Fires often scarify the hard elderberry seed coat leading to germination of seedlings the following season (Crane 1989). Frequent or repeated fire, however, may kill remaining shoots, root crowns and seeds, causing elderberry shrubs to be eliminated from an area for many years since recruitment by seeds is patchy and generally slow (Crane 1989). Elderberry shrubs appeared suitable for the beetle 2 to 6 years after burning, but were often uninhabited, with the presence of old, burned exit holes suggesting pre-burn occupancy and post-burn vacancy (Talley et al. 2006). The post-fire lag in occupancy is likely the result of the limited movements of the beetle. No quantitative studies of the net effects of fire on the beetle have been undertaken (e.g., examining beetle and elderberry through time after burns or in areas with varying burn frequencies and magnitude).

The beetle can tolerate flooding of its riparian habitat. The animal has higher occupancy rates in riparian than non-riparian habitats, and associations between the beetle and proximity to rivers were either not observed or there was a weak positive correlation with nearness to the river (Halstead and Oldham 1990; Talley 2005; Talley et al. 2007). These findings illustrate that the beetle is likely not harmed by flooding and that higher habitat quality may be associated with rivers. In addition, if elderberry, a facultative riparian shrub, can withstand flooding, then the beetle likely will survive these events. Most floods occur during winter or early spring when the beetle is in its early life stages, so the effects of flooding are even less likely to affect the beetle. If the shrub is exposed to prolonged flooding (i.e., anoxia) and becomes severely stressed, then the beetle may be affected. The duration and magnitude of flooding at which elderberry shrubs undergo stress is uncertain and the levels of stress that affect the beetle are also unknown. Elderberry shrubs have adaptations that plants use to persist with flooding, such as lenticels and aerenchyma, demonstrating that it is probably at least somewhat flood tolerant. Finally, if an
area is flooded too frequently so that elderberry shrubs cannot survive, then no beetles would be able to inhabit the area (Talley 2005).

Another potential factor in the beetle’s decline is the effects of inappropriate levels of livestock grazing, which can result in destruction of entire elderberry shrubs and inhibition of elderberry regeneration. Cattle, sheep and goats readily forage on new elderberry growth, and goats will consume even decadent growth. Well-manicured stands of elderberries, such as occurs due to livestock grazing, have generally been shown to have a relative absence of beetles (USFWS 1984). The effects of both grazing and exotic plant invasions on the beetle are likely significantly exacerbated by the problem of habitat fragmentation. Such fragmentation increases the edge: interior ratio of elderberry patches, thereby facilitating the adverse effects of these outside influences.

**Environmental Baseline**

A GIS vegetation model based on shrub cover types within the range of the valley elderberry longhorn beetle that may include elderberry shrubs resulted in the identification of approximately 4,803 acres within the Monument as potential valley elderberry longhorn beetle habitat. This potential habitat includes chaparral, foothill and oak woodland below 3,000 feet. The elderberry shrubs within this area are presumed to predominantly be associated with riparian zones or in moist areas, primarily on north facing slopes scattered throughout the chaparral.

Previously conducted surveys within the Monument and areas adjacent to the Monument have documented evidence of elderberry shrubs being occupied by the valley elderberry longhorn beetle. Therefore, given the on-site and nearby records of the animal, the biology and ecology of the species, and the presence of suitable habitat, the Service has determined that it is reasonable to conclude that the beetle inhabits the 4,803 acres within the action area.

Past and ongoing activities within the action area that are likely to affect the valley elderberry longhorn beetle include fuels reductions projects (both prescribed burning and mechanical/hand removal), historic grazing at high stock levels, private development, and construction and maintenance of hydroelectric facilities and transmission lines.

**Effects of the Proposed Action**

Adverse effects to the valley elderberry longhorn beetle from the proposed project consist primarily of removal of elderberry shrubs with stems greater than one inch in diameter at ground level during the implementation of vegetation management activities below 3,000 feet in elevation. This includes the construction of fire lines, skid trails, and landing sites and mechanical thinning and prescribed burning. Of the 4,803 acres of potentially valley elderberry longhorn beetle habitat, 4,727 acres are located within areas identified as a fuels treatment priority. Removal of elderberry shrubs is likely to result in adverse effects to the beetle due to the loss of foraging and breeding habitat, as well as the mortality of larvae within the host plant. Additionally, the removal of shrubs within occupied area may result in the mortality of adults through implementation of fuels management activities.
Prescribed burns may result in direct mortality of the beetle if occupied shrubs are consumed. Prescribed burns may also result in direct mortality if burns are conducted within occupied habitat during the period when dispersing and breeding adults are present (i.e., during the flight period). The potential effects of vegetation management activities will be reduced to some extent where elderberry plants occur within riparian conservation areas and critical aquatic refuges due to specific conservation measures being applied to these areas. However, elderberry plants are not riparian dependent and may occur greater than 150-300 feet from the nearest aquatic feature. In addition, project level activities may occur within riparian conservation areas and critical aquatic refuges if the activities are determined by the Forest Service to be compatible with riparian conservation objectives.

Implementation of vegetation management under Monument Plan will likely result in adverse effects to the valley elderberry longhorn beetle due to the loss of habitat. However, vegetation management is not anticipated to occur over the entire area at any given time, which would likely provide a mosaic of suitable habitat for the valley elderberry longhorn beetle as damaged elderberry shrubs regenerate, thereby not resulting in the loss of valley elderberry longhorn beetle populations. Additionally, strategic vegetation management activities will likely reduce the risk of large-scale, high-intensity fires. Vegetation management in areas occupied by valley elderberry beetle will likely result in short-term adverse effects to the species, while a high-intensity fire would likely result in a much greater, longer-term effect to the valley elderberry longhorn beetle due to vegetation type conversion.

**Cumulative Effects**

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed implementation of the Monument Plan are not considered in this section; they require separate consultation pursuant to Section 7 of the Act. The Service is not aware of specific projects that might affect the valley elderberry longhorn beetle in the action area that are currently under review by State, county, or local authorities.

**Conclusion**

After reviewing the current status of valley elderberry longhorn beetle, the environmental baseline for the action area, and the effects of the proposed action, and the cumulative effects on these species, it is the Service’s biological opinion that the proposed implementation of the Monument Plan, as described herein, is not likely to jeopardize the continued existence of this species. We base this conclusion on the following: 1) effects to the species due to vegetation management will be limited through the protection of riparian conservation areas and critical aquatic refuges; and 2) the areas represent a small portion of the species’ range; and 3) vegetation management is not likely to significantly reduce valley elderberry longhorn beetle populations within the Monument.
INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act, provided that such taking is in compliance with this Incidental Take Statement.

No exemption from Section 9 of the Act is issued through this biological opinion. The Forest Service's implementation of the Monument Plan is likely to adversely affect the valley elderberry longhorn beetle. However, the proposed action, by itself, does not implement specific projects or activities that affect the species, and is one of many steps in the planning process by the Forest Service. The likelihood of incidental take, and the identification of reasonable and prudent measures and terms and conditions to minimize such take, are addressed at many of these planning and implementation levels. These levels could include the adoption of standards and guidelines standards and guidelines at the project level. Any incidental take and measures to reduce such take cannot be effectively identified at the level of the proposed action because of its generic nature and its scope: many of the standards and guidelines within the Monument Plan are narrative and thus represent broad, general principles that do not identify specific or quantitative criteria, and have effects that cannot be adequately measured at this level. Rather, incidental take and reasonable and prudent measures may be identified adequately through subsequent actions subject to section 7 consultations. Further site specific projects utilizing the standards and guidelines and Monument Plan direction are also subject to section 7 review to determine whether they are adequate to protect listed species at the project level.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of information or data bases. The Service recommends the following actions:

1. The Forest Service should work with the Service and other partners in the development of ecological restoration activities for the enhancement of valley elderberry longhorn
beetle habitat.

2. The Forest Service should limit both the size and the scope of vegetation management activities conducted in fisher habitat until the effects of such activities on fisher are better understood.

3. Vegetation management activities within fisher habitat should be conducted in a manner that provides for the retention and/or regeneration of adequate level of forest complexity to continue to meet the species’ life history needs.

4. The Forest Service should implement vegetation management activities within fisher habitat in a manner that provides an adequate amount of fisher habitat of appropriate complexity at any given time to maintain viable fisher populations.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION—CLOSING STATEMENT

This concludes formal consultation on the implementation of the Giant Sequoia National Monument Management Plan. As provided in 50 CFR §402.16, reinitiation of formal consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (1) if the amount or extent of taking specified in the incidental take statement is exceeded; (2) if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (2) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or (4) if a new species is listed or critical habitat designated that may be affected by the identified action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must immediately cease pending reinitiation.

If you have any questions regarding this biological opinion on the proposed implementation of the Giant Sequoia National Monument Management Plan please contact Jeremiah Karuzas or Ryan Olah, Coast Bay/Forest Foothill Division Chief, at (916) 414-6600.

Sincerely,

[Signature]

Jan Knight
Acting Field Supervisor
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