VEGETATION MANAGEMENT PLAN

and

INITIAL STUDY / NEGATIVE DECLARATION

CALAVERAS BIG TREES STATE PARK

February 2018

State of California
California State Parks

Joseph Harvey

Environmental Scientist
California State Parks-Central Valley District
Columbia, CA 95310

Heather M. Reith

Senior Environmental Scientist
California State Parks-Central Valley District
Columbia, CA 95310

Acknowledgments

The authors thank the Sierra Nevada Conservancy, an agency of the State of California that provided the funding for the completion of this plan. The authors also thank the following individuals that provided expert input and technical review and were integral in this plans completion: Stephen Bakken and James Suero (CSP Foresters), Wayne Harrison (Senior Environmental Scientist, Retired), Nathanial Wigington (Environmental Scientist), and Linda Dick-Bissonnette (Associate State Archaeologist). Finally, thank you to Central Valley District Superintendent, Jess Cooper and District Services Manager, Liz Steller for your support of this plan and its proposed management practices.

NEGATIVE DECLARATION

PROJECT: Calaveras Big Trees State Park Vegetation Management Plan

LEAD AGENCY: California State Parks

AVAILABILITY OF DOCUMENTS: The Initial Study for this Negative Declaration is available for review at:

- Central Valley District Headquarters
  California State Parks
  22708 Broadway Street
  Columbia, CA 95310

- Calaveras Big Trees State Park
  1170 State Highway 4
  Arnold, CA 95223

- Calaveras County Library-Arnold Branch
  1065 Blagen Rd
  Arnold, CA 95223

- California State Parks
  Northern Service Center
  One Capitol Mall, Suite 410
  Sacramento, CA 95814

PROJECT DESCRIPTION:

This plan addresses the management of vegetative resources at Calaveras Big Trees State Park (CBTSP). A long-term vegetation management plan helps to ensure continuity of actions toward mutually accepted management goals and objectives over time. The Sierra Nevada Conservancy, an agency of the State of California, provided funding for this plan.

A copy of the Initial Study is attached. Interested parties may address questions or comments regarding this Initial Study/Negative Declaration to:

Brad Michalk
California State Parks
Northern Service Center
One Capitol Mall, Ste. 410
Email: CEQANSC@parks.ca.gov
Fax: 916-445-8883

Pursuant to Section 21082.1 of the California Environmental Quality Act, the California Department of Parks and Recreation (DPR or California State Parks) has independently reviewed and analyzed the Initial Study and Draft Negative Declaration for the proposed project and finds that these documents reflect the independent judgment of DPR. DPR, as lead agency, also confirms that the

Project Requirements detailed in these documents are feasible and will be implemented as stated in the Negative Declaration.

Jess Cooper
District Superintendent

2/22/18
Date

Brad Michalk
Environmental Coordinator

February 22, 2018
Date

CONTENTS

TABLE OF FIGURES

APPENDICES

I. INTRODUCTION

This plan addresses the management of vegetation resources at Calaveras Big Trees State Park (CBTSP). Funding for this plan has been provided by the Sierra Nevada Conservancy, an agency of the State of California.

The state of health of plant resources is very influential to the entire ecosystem. Plant resources are the basis for the habitat requirements that support faunal communities, are essential to the development of soils, are intimately involved in the cycling of water resources, and even play a role in the evolution of geologic features.

Ecosystems change over time as plants establish and grow. Some changes are more notable when they result from periodic disturbances such as fire, flood, storm, and drought. Successional changes occur over a long period of time, a process not often perceived in the span of a single manager's career who will likely observe only gradual changes in the structure and composition of the park's forests. When Department managers witness infrequent natural disturbances, they may interpret these events as disasters that could and should have been prevented. However, some disturbances may be part of vital ecological processes and natural successional changes. Furthermore, park lands are subjected to human caused disturbances associated with heavy visitor use, including changed soil characteristics, water movement, reduced species diversity, and invasions of non-native species. If managers lack knowledge about the underlying cause of changes and/or the management decisions of their predecessors, their response may be unnecessary, ineffective, or incompatible with previous actions. A long term vegetation management plan can help to ensure continuity of actions toward mutually accepted management goals and objectives over time.

A. Purpose

This plan defines the need to be actively and proactively engaged in ensuring that the plant communities represented in CBTSP are properly managed, according to the best practices available. This plan also defines goals for these plant communities in terms of a desired condition for each, describing the range of acceptable management practices, and establishing guidelines for how and when they are to be used, describing any constraints that may limit their application. Furthermore this document will generate corporate memory, allowing future managers to build upon knowledge gained from past efforts. By creating and implementing this plan, it is the intent of district resource managers to be effective stewards of the natural values that make CBTSP such an important part of the Sierra Nevada ecosystem, making sure that it will continue to be a treasured part of California's natural heritage for generations to come.

B. Scope

This plan describes the historic, current, and future direction and allowable practices for vegetation management at CBTSP.

C. Document Organization

DPR has organized the document as follows:

Chapter I - Introduction.

This chapter provides an introduction to the project.

Chapter II -– Vegetation Management Goals.

This chapter identifies the Goals of the Plan, describes the reasons for the project, scope of the project, and project objectives.

Chapter III – Area Description.

This chapter characterizes the park location and setting, topography, climate, hydrology, geology/soils, vegetation, wildlife and cultural resources.

Chapter IV – Vegetation Management History.

This chapter provides an overview of vegetation management efforts that have occurred within the park over the years.

Chapter V – Vegetation Management Plan.

This chapter consists of the actual Vegetation Management Plan for wildland areas and is one of the three components for which Chapters XIV and XV assesses impacts.

Chapter VI – Developed Area Vegetation Management Plan.

This chapter consists of the Vegetation Management Plan addressing developed areas of the park and along with Chapters V and VII, is the basis for what Chapters XIV and XV assesses impacts.

Chapter VII – Beetle Outbreaks.

This chapter consists of an overview of the issue surrounding bark beetle outbreaks, the intended method of best attempts to manage such outbreaks, fire hazard issues related to outbreaks and stand mortality management. This Chapter along with Chapters V and VI are the actions for which the Initial Study assesses impacts.

Chapter VIII – Community Relations and Public Education.

This chapter consists of an overview of how the park educates visitors and the public regarding vegetation management efforts.

Chapter IX – Unscheduled Disturbances.

This chapter consists of a discussion of how to treat the occurrence of natural weather-related events and how such events would affect plan implementation.

Chapter X – Review and Approval.

This chapter summarizes the department review and approval process for long-term vegetation management plans at State Parks.

Chapter XI – Monitoring.

This chapter describes the monitoring protocol required for units within CBTSP. Monitoring and management of the units includes documentation of forest succession conditions and presence or spread of invasive species.

Chapter XII – CEQA review introduction.

This chapter provides an overview of the regulatory guidance used in the preparation of this document.

Chapter XIII – CEQA Project Description.

This chapter describes the scope of the project, project requirements and project objectives.

Chapter XIV - Environmental Setting, Impacts, and Mitigation Measures (Environmental Checklist).

This chapter identifies the significance of potential environmental impacts, explains the environmental setting for each environmental issue, and evaluates the potential impacts identified in the CEQA Environmental (Initial Study) Checklist. Mitigation measures are incorporated, where appropriate, to reduce potentially significant impacts to a less than significant level.

Chapter XV - Mandatory Findings of Significance.

This chapter identifies and summarizes the overall significance of any potential impacts to natural and cultural resources, cumulative impacts, and impact to humans, as identified in the Initial Study.

Chapter XVI - References.

This chapter includes all references cited in both the Vegetation Management Plan as well as those referenced in the Initial Study.

THIS PAGE INTENTIONALLY LEFT BLANK

II. VEGETATION MANAGEMENT GOALS

- To protect, preserve, and when necessary, restore ecological processes.
- Thin forest stands throughout the park to obtain forest heterogeneity for overall ecosystem health.
- Decrease fuel loadings throughout the park to reduce vulnerability to catastrophic wildland fire.
- Create a healthy forest resilient to disease infestations and outbreaks.
- In developed areas, maintain a manageable level of risk for public health and safety.

THIS PAGE INTENTIONALLY LEFT BLANK

III. AREA DESCRIPTION

A. Unit Location and Size (Figure 1)

Calaveras Big Trees State Park is located on the western slope of the Sierra Nevada, in both Calaveras and Tuolumne counties. The park is generally within the zone of Mixed Conifer/Ponderosa Pine dominated plant communities, and ranges in elevation from approximately 3400 feet (1035 meters) to 5560 feet (1700 meters) in elevation. The park is approximately 6497 acres (2629 hectares) in size, roughly evenly divided between the two counties along the course of the North Fork Stanislaus River. Within CBTSP is a distinct, but dependent unit of the State Park System, the Calaveras South Grove Natural Preserve. This classification is granted by the California State Parks Commission only for portions of existing park units that possess unique biological values that warrant exceptional protection, and where public access and enjoyment are considered as secondary benefits to the perpetuation of these characteristics. The 1,450 acre (590 hectares) natural preserve was established in 1984.

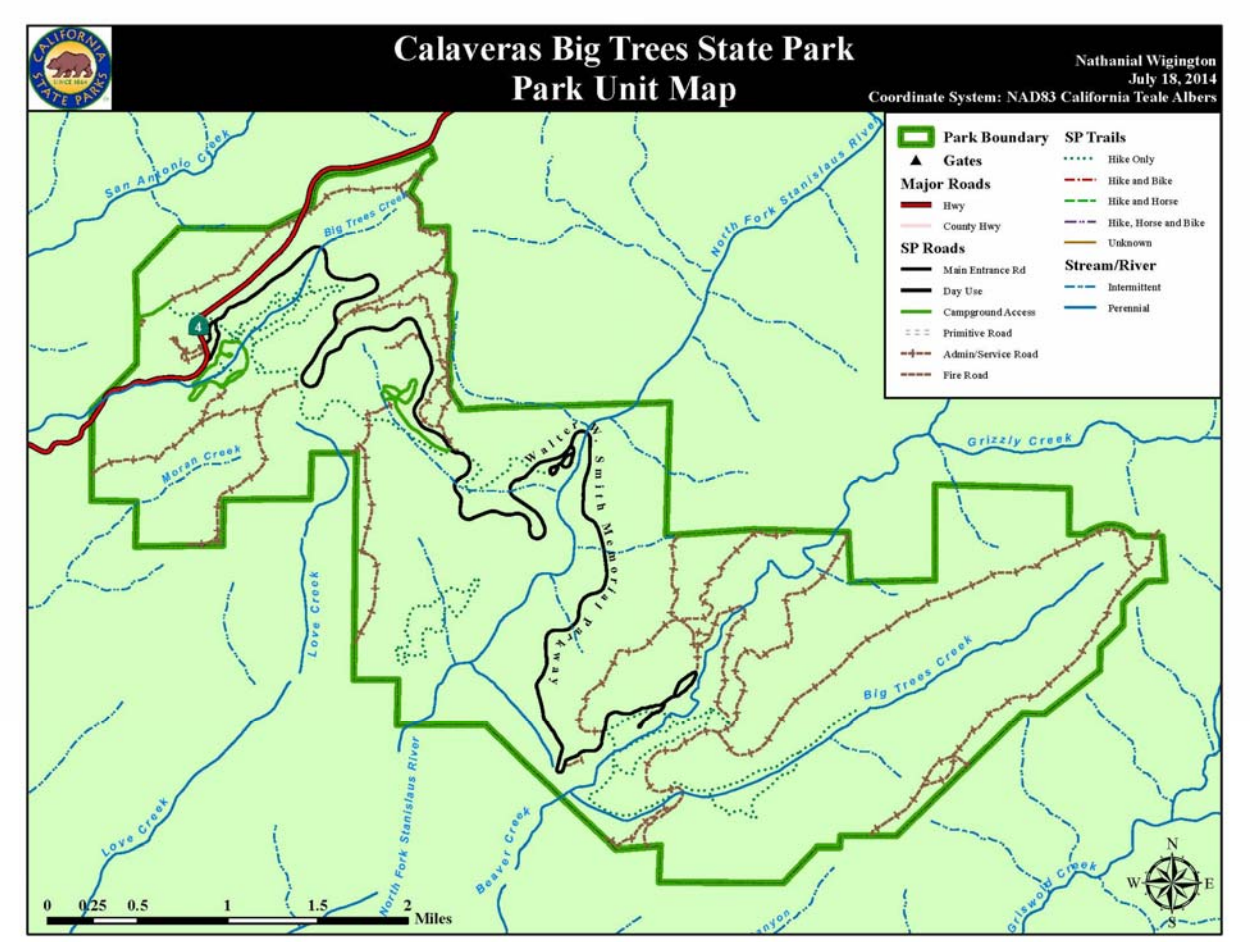


Figure 1-Map of Calaveras Big Trees State Park (CBTSP) including roads, trail, and watercourses

B. Topography

Calaveras Big Trees State Park is located midway up the western slope of the Sierra Nevada. This slope is drained by deeply incised rivers that generally trend from the northeast towards the southwest. The major drainage in the park, the North Fork Stanislaus River, flows through a steep walled canyon with slopes that average about 40 to 50 percent.

Elevations are highest at the northeast and southeast corners of the park, at 5,230 and 5,560 feet (1,600 and 1,700 meters) respectively, while the lowest elevation is where the North Fork leaves the park at 3,415 feet (1,040 meters). Most of the park is between 4,000 and 5,000 feet (1,220 and 1,320 meters).

C. Climate

The western slope of the Sierra Nevada is in a region of Mediterranean climate, with typically warm, dry summers and cool wet winters. Temperatures are mild throughout the year, rarely rising over 100°F (38°C) during the summer or below 20°F (-7°C) during the winter. The highest monthly mean temperature is 84°F (29°C) in July, while the corresponding low is 27°F (-3°C) in February.

Precipitation has averaged about 55 inches (140 centimeters) for the last half of the 20th Century with approximately 25% of this falling as snow. Most of this falls between mid-October through April. Summer precipitation is associated with afternoon thunderstorms and subtropical storms moving up from the Gulfs of California and Mexico (Finan, personal communication, October 7, 2015). Wide fluctuations in precipitation and temperature for periods of years are not uncommon with documented multi-year droughts and back-to-back wet years.

Scientific evidence indicates that California's climate is changing but there is scientific uncertainty in predicting the degree of change or the associated impacts. For the Sierra Nevada, which includes CBTSP, current science predicts that by the end of the 21st century; temperatures will increase by 3° to 10.5°F (1.7° to 5.8°C), risk of large wildfires will increase by 10-55%, and the snowpack will be reduced by 30-90% (Luers et al, 2006).

1. Fire History

Prior to the arrival of white settlers to the Sierra Nevada, wildland fire had an important influence on the arrangement of the region's vegetation. Based on fire history studies in CBTSP and in comparable forests elsewhere in the range, fires have burned with great regularity for the past few thousand years and likely since at least the end of the last glacial period. Little is known about the extent of these fires, but it is generally assumed that they usually burned with low to moderate intensity, consuming fuels that had not recovered enough mass since the last fire to burn otherwise. They would continue to burn until they ran out of available fuel, whether by reaching natural barriers such as rivers or rock outcrops, or by burning into areas where the fuel was not suitable for burning (e.g., being too wet or too sparse to carry fire), or by having the fire extinguished by rain or snow.

Close analysis of the fire scars collected in the Sierra Nevada clearly indicates that the vast majority, about 95%, occurred near the end of the growing season, late in summer when lightning storms are common. Few of the fire scars were found on the early growth part of a tree ring, suggesting that spring or early summer fire starts were rare, or perhaps that such fires did not begin to spread to cover a large area until later in the season.

Fires became rare after about 1865, or soon after the occupation of the area by Euro-Americans (Swetnam 1993). Since this was several decades before the advent of modern fire suppression, other reasons must exist to explain why wildland fire activity decreased during this period. Two ideas have been proposed. The first is grazing of vast sheep herds driven up into the mountains during the summer severely altering the arrangement and density of the fuels that could carry fire. The second idea is that burning practices conducted by local Native Americans were suppressed by the white settlers as they moved into the mountains. It is likely, that both factors played a role in limiting the frequency of fires. Regardless of the cause, the effect was the same. Forests that had evolved for over 10,000 years in the presence of frequent fire were now in a largely fire-free landscape.

D. Hydrology (Figure 2)

The major topographic feature of CBTSP is a canyon created by the North Fork Stanislaus River, with approximately half of the park draining directly into it, mainly through minor seasonal streams and overland flow. The river courses within the park for 2 ½ miles (4 km), dropping about 250 feet (76.2 m). The North Fork's flow is regulated by four dams located approximately 20 river miles (32.2 km) upstream from the park.

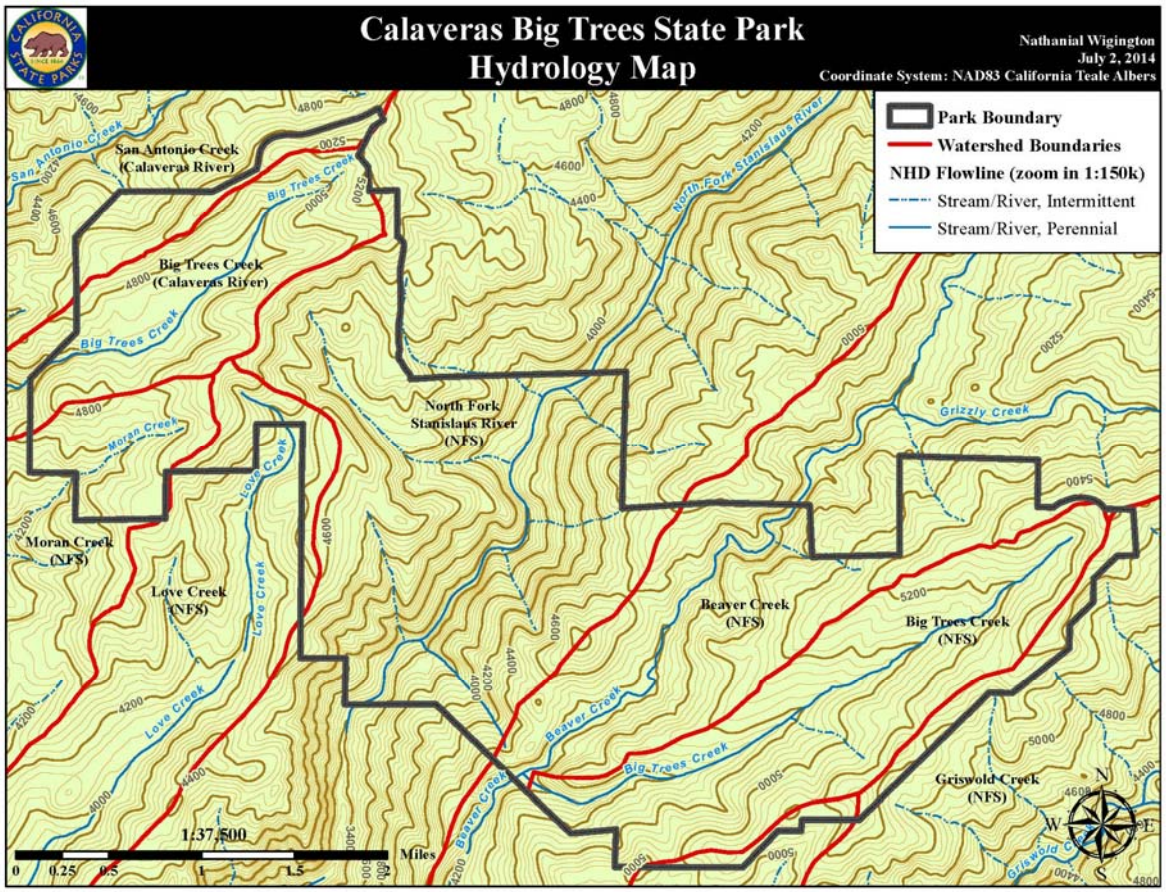


Figure 2-Watershed map of CBTSP.

The other major watercourse is Beaver Creek. This is a California State Parks Representative Keystone Watershed which represents, physical, biological, and aquatic values characteristic of the ecoregion, a healthy aquatic system with good water quality, is free from serious exotic species

problems and extensive land alterations and is linked to other protected areas large enough to sustain species abundance and variety. This perennial stream runs roughly parallel to the North Fork Stanislaus River about one mile to the southeast, draining 20,299 acres (8,215 hectares) 10% of which is within CBTSP. Beaver Creek eventually joins the North Fork Stanislaus River downstream from the park boundary (CSP, 2007).

Three other minor drainages occur in the park, two of which are entirely within its borders. Big Trees Creek (in the South Grove Natural Preserve) is the largest of the three, draining an area of about 1,400 acres (570 hectares) and flowing into Beaver Creek while still within the park. Oak Hollow Creek,

(formerly known as Squaw Hollow Creek) is a seasonal stream that flows eastward into the North Fork Stanislaus River. Finally, Big Tree Creek starts in the North Grove as a seasonal watercourse, but becomes perennial immediately below the North Grove Meadow, eventually flowing into San Antonio Creek, near the community of White Pines.

Various springs are located in the park, some of which have been plumbed as water sources, although only two, Oak Leaf Spring and the headwaters of Oak Hollow Creek are currently maintained as water sources.

E. Geology

Calaveras Big Trees is located in the Sierra Nevada Geomorphic Province, east and upslope of the Mother Lode gold belt. Geologic units that crop out in the park include metamorphic rocks of the Paleozoic Era, Cretaceous granitics, Tertiary volcanic flows and pyroclasts, and Quaternary alluvium and colluvium.

Tertiary Rocks: The Eureka Valley Tuff (Toll House Flat member) is exposed in two areas of the southwest part of the park: near the Gate 12 (Figure 1), and along the ridgetop above the Lava Bluffs Trail. The Toll House Flat member is an ash flow tuff that is moderately to densely welded, with abundant phenocrysts and rock fragments. Table Mountain Latite underlies these exposures, and outcrops in the Lava Bluffs visible from the trail, and on the spur ridge above the trail's parking lot. The latite is dark and dense, similar to basalt in appearance. Rocks of the Mehrten Formation are the most extensively exposed volcanic rocks in the park. It is exposed on the higher ridges throughout CBTSP, and consists of andesitic ash flows, volcanic conglomerate, and ash flow tuffs. The best example of a Mehrten ash flow deposit in the park can be observed in the Walter W. Smith Memorial Parkway's (the Parkway) road cut near the entrance to the Scenic Overlook parking lot, on the ridge southeast of the North Grove.

Cretaceous Rocks: Granitic intrusive rocks are the most widely exposed type within the park, and form the 'basement' of the unit. Granitics are well exposed along State Route 4 from the west boundary to the entrance road, and along the Parkway from Oak Hollow Campground to Beaver Creek. In places the rocks are heavily weathered and unstable.

Paleozoic Rocks: Associated with the granites are contact metamorphosed sedimentary and volcanic rocks that occur within as roof pendants, with the parent material likely being from the Paleozoic Era. These mostly metaquartzite rocks occur occasionally throughout the granitic terrain.

Landslides are not a widespread problem in CBTSP, although there are two significant and generally active slides located on the Calaveras County side and along the Parkway. Historic (ca. 1960) road management called for the toes of these slides to be cut back from the Parkway as they intruded, but it was later understood that this only served to stimulate further downslope movement, and when this cutting ended the slides stabilized.

Indications of slumping are found along the Parkway on the Tuolumne County side from Oak Leaf Springs ridge along the Beaver Creek drainage, mostly as arcuate cracks and slight depressions occurring in the pavement. One minor slide occurred near Oak Leaf Springs in the 1990s, closing the road until repairs could be made.

Two anomalous geologic features have been located in the park, to the extent that they have not been either well described or mapped. Between the western-most extent of the Lava Bluffs Trail and the nearest portion of the park boundary an exposure of columnar basalts has been identified, with the typical hexagonal cross-section. Also, as excavation was being conducted to construct the current warming hut near the North Grove, fossilized wood was uncovered.

F. Soils

The park is located in California's Soil Region III, referred to as the "Sierra Nevada, Trinity, Cascade, and Sierra of Southern California" region. Soils in this region are typically derived from igneous rocks, both intrusive and extrusive. Specifically at CBTSP, the predominant parent material of the soils is from the grantic-granodiorite complex of the Sierra Nevada plutons, which are typically deep, rich, and productive. Other soils develop from andesitic deposits and, less commonly, from metamorphics associated with the granitics, which generally are shallow and poorly developed. For a map and description of soil series of CBTSP see appendix B and figure 8.

G. Vegetation (Figures 3a and 3b)

Calaveras Big Trees State Park lies within the Lower Montane Forest zone of the Sierran Floristic Province, a broad belt lying between 3,000 and 6,000 feet (915 to 1,830 m) in elevation. The park is situated in the midst of an extensive and productive coniferous forest, dominated by ponderosa pine (*Pinus ponderosa*) and white fir (*Abies concolor*). Associated (and sometimes locally dominant) species include sugar pine (*P. lambertiana*), incense cedar (*Calocedrus decurrens*), and giant sequoia (*Sequoiadendron giganteum*). A small population of another conifer, Pacific yew (*Taxus brevifolia*), occurs in the North Grove, at the southern limit of its natural range. The most common hardwood species include black oak (*Quercus kelloggii*), Pacific dogwood (*Cornus nuttallii*), and canyon live oak (*Q. chrysolepis*), with associates of bigleaf maple (*Acer macrophyllum*) and white alder (*Alnus rhombifolia*) in more mesic locations.

Distribution of most of the tree species are, under natural conditions, governed by micro-climatic variations. Thus, ponderosa pine would normally be dominant on ridge tops and south to west facing slopes, while white fir would be dominant on the cooler and wetter north and east facing slopes (North, 2012). However, decades of fire exclusion have allowed the shade tolerant white fir and incense cedar to successfully colonize into and become co-dominant in historic ponderosa pine dominant stands. Now the ponderosa pines, in the absence of stand opening disturbances, have reduced regeneration, and there is concern that without significant management effort, stand composition will continue to shift to shade tolerant dominance and reduced fire resilience.

Of great interest are the two groves of giant sequoia located at CBTSP (Figures 3a and 3b). The smaller North Grove is approximately 60 acres (24 hectares) in size, contains 160 large, old growth specimens, and is the subject of heavy, year-round use by park visitors. The South Grove is much larger in size (about 500 acres, or 202 hectares) and contains over 1,000 specimens. Due to its relative remoteness it is not used by the public very heavily when accessible, and is virtually inaccessible for several months each year, when snow closes off much of the park.

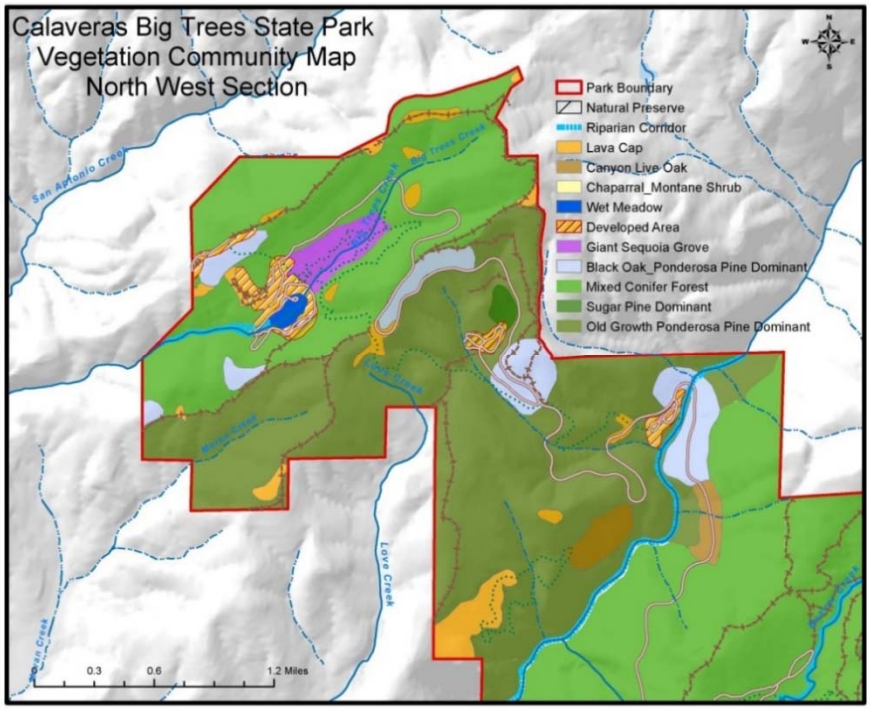


Figure 3-Vegetation community map including developed areas for CBTSP Northwest section.

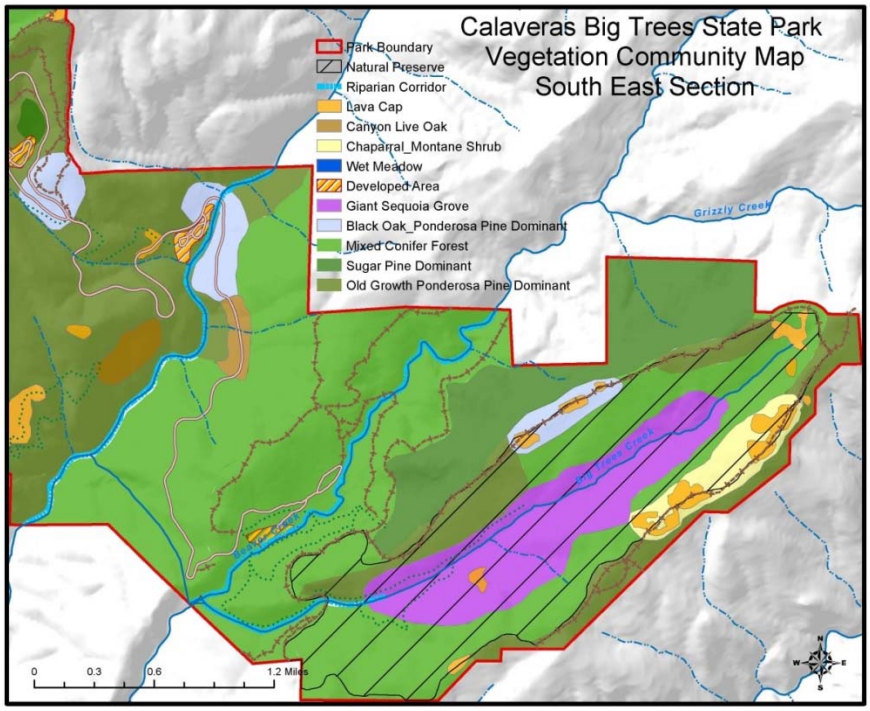


Figure 4-Vegetation community map including developed areas for CBTSP Southeast section.

Shrub species include greenleaf manzanita (*Arctostaphyllus patula*), mountain whitethorn (*Ceanothus cordulatus*), deerbrush (*C. integerrimus*), buckbrush (*C. cuneatus*), western hazelnut (*Corylus cornus californicus*), Sierra coffeeberry (*Rhamnus rubra*), Sierra gooseberry (*Ribes roezlii*), thimbleberry (*R. parviflorus*), currant (*R. sp*.), bear clover (*Chamaebatia foliolosa*), California rose (*Rosa californica*), willow (*Salix sp*.) and western azalea (*Rhododendron occidentale*).

There are a large number of native herbaceous species at CBTSP, but only one that requires consideration under this plan: Stebbins' desert parsley (*Lomatium stebbinsii*), requires mention in this plan, since it is a species listed as "rare, threatened, or endangered in California" by the California Native Plant Society (formally on the society's 1B.1 list). This plant occurs on very dry and open areas with shallow, poorly developed soils, typically on lava caps at CBTSP.

There are a limited number of exotic plant species within the park, consisting mostly of introduced grasses and ornamentals, and their expansion within the park is limited. Only two have presented an ongoing control problem: common mullein (*Verbasum thapsus*) and bull thistle (*Cirsium vulgare*); both being common in disturbed areas, and the latter being especially problematic after fire.

Many of the plant species in CBTSP are dependent on frequent (12-17 year) naturally occurring fires that burn at a relatively low to moderate intensity with patches of high intensity. In the case of the park's tree species, giant sequoia, ponderosa pine, and black oak are particularly affected in the absence of these periodic disturbances. In each case, the primary impact is an increasingly serious absence of successful regeneration. In the case of the black oak, an additional problem is the alteration of the trees' growth habit from heavily horizontal to vertical, resulting in tall, slender trees with weak branches. These trees have grown dependent on the support of conifers rising through their canopies so when these conifers are removed the now solitary oaks are too weak to avoid severe damage from winter snow loads.

H. Wildlife

According to the "California Wildlife Habitat Relationships System", CBTSP is comprised of the following habitats; Sierran mixed conifer, ponderosa pine, montane hardwood conifer, montane riparian, montane chaparral, wet meadow, and riverine. Together these habitats support over 355 animal species (Verner and Boss 1980). The variety in plant species found within CBTSP provides diversity in forage and cover essential for wildlife (Kosco and Bartolome 1983). Mature forests are valuable to cavity nesting birds and provide transitional or migratory habitat for deer and other species. Rodents, deer, and other herbivores inhabit the montane chaparral as well as a wide variety of bird species that feed on seeds, fruits and insects. Riparian habitats have an exceptionally high value for many wildlife species providing water, thermal cover, migration corridors, nesting habitat and feeding opportunities (Thomas 1979, Marcot 1979, Sands 1977). Sensitive bird and mammal species include California spotted owl (*Strix occidentalis occidentalis*), American marten (*Martes americana*), and is part of the historic range for the fisher (*M. pennant*) and willow flycatcher (*Epidonax traillii*) (Verner and Boss 1980).

Typical and notable wildlife of the region include black bear (*Ursus americanus*), mountain lion (*Puma concolor*), bobcat (*Lynx rufus*), gray fox (*Urocyon cinereoargenteus*) mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), western (California) gray squirrel (*Sciurus griseus)* and Douglas squirrel (*Tamiasciurus douglasii*). Bird species found in the forest habitat include the mountain chickadee (*Poecile gambeli*), golden-crowned kinglet (*Regulus satrapa*), red-breasted nuthatch (*Sitta Canadensis*), Steller's jay (*Cyanocitta stelleri*), common raven (*Corvus corax*), dark-eyed junco (*Junco hyemalis*), and a number of woodpecker species. Notable riparian species include river otter (*Lantra canadensis*), canyon wren (*Catharpus mexicanus*), and water ouzel (*Cincus mexicanus*). Amphibian

species are not well studied, but include ensatina (*Ensatina eschscholtzii),* foothill yellow-legged frog (*Rana boylii*) and (historically) California red-legged frog (*Rana draytonii*). Native fish species no longer occur in the park. The California roach (*Hesperoleucus symetricus*), was last seen in the North Fork Stanislaus River in the early 1990s, just a few years after New Spicer Dam altered river temperature regimes to the extent that the species was no longer stimulated to breed. Currently, the only common fish species are rainbow trout (*Oncorhynchus mykiss*) and the introduced brown trout (*Salmo trutta*). Recent studies indicate that the giant sequoia canopy in the South Grove support a range of non-descript insect species, although their comparative rarity has not been determined due to the lack of wide-spread sampling.

I. Cultural Resources – Prehistoric and Historic

Cultural resources are physical remains of past human activities, often including their natural setting or scenic vistas. Recorded cultural resources at CBTSP (53) include indigenous habitation and special use sites, the 1865 Perry Cottage-Park Headquarters Building, CCC Recreation Building (aka Big Trees Lodge or Jack Knight Hall), Big Stump and The Chip (and other named sequoias both fallen and living), historic buildings, bridges, roads, trails, structures, the North Grove Campground, stone masonry structures, tunnels, ditches, logging railroad grades, former hotel and cabin sites, a stage coach stop, and historic dump sites.

Native Americans: Calaveras Big Trees State Park possesses a rich cultural heritage having likely been at least seasonally occupied for several thousand years. The earliest known Native American occupation dates from about 8000 B.C.E., based on findings unearthed in Spicer Meadow located about 20 miles upslope from the park, and occupation of the park area by Euro-Americans has been virtually continuous since 1853.

CBTSP has several cultural features that indicate occupation by native peoples. Although none have been dated, it is likely that most are from the Central Me-Wuk culture (the most recent in the region). Studies suggest that park lands around the North Grove may have also been included in a segment of an east-west trading route that crossed the Sierra Nevada, and that this may have been used by the Washoe tribe from the range's east slope and from western Nevada. The park has been well surveyed, and it appears that a higher proportion of native sites are found in the northwestern part of the park, in the general vicinity of this trade route. Access to this part of the park would have been much easier from the west (the Sierra foothills and the Central Valley) than it would have been to the southeastern Tuolumne side, since no deep canyons would have to have been traversed.

There are 36 known Native American sites within the park, all of which consist of rock related features (i.e., bedrock mortars and/or lithic scatters), and there is no indication that the park's lands were permanently occupied. It is more likely that seasonal camps were established during the warmer months to take advantage of game movement, fish spawning, and acorn crops.

Euro-Americans: The earliest known presence of Euro-Americans in CBTSP was possibly 1833, when the Walker Party crossed the Sierra Nevada. Although the route of the party remains unclear, the diary of one member of the party, Zenas Leonard, contains the earliest documented reference to giant sequoias. While it is possible that he might have been referring to either the Tuolumne or Merced groves north of Yosemite Valley, at least one historian felt that the reference could also apply to the Calaveras North Grove (Farquhar 1925). Regardless, the earliest unequivocal account of the giant sequoia in general, and the North Grove in particular, dates from 1852, by the professional hunter Augustus Dowd. By 1853, the North Grove had been settled, and the area has been occupied ever since, primarily as a tourist attraction. Various phases of occupation and use of CBTSP by Euro-Americans occurred after the discovery, starting with the construction of a small hotel in 1854, and

continuing through the development of campgrounds, another larger hotel, roads, trails, and associated infrastructure.

Most of the development associated with this period was in the Calaveras County portion of the park, although there was a plan to construct a small hotel in the South Grove at one time, and a small fire warden's cabin was built there, near the Palace Hotel Tree. Of the facilities installed on the Calaveras County side, most of these were placed in or around the North Grove of giant sequoias.

To a large extent these early facilities have been replaced, removed, or abandoned, but their importance to the park's cultural landscape remains. The most significant structure from this period is the current park office, constructed in the early 1860s, and was used for most of its time as residence.

J. Cultural Resources – Park Facilities

CBTSP became a unit of the State Park System in 1931, with the acquisition of the North Grove and some of the surrounding land. Additional property was added at various times in the past. One of the largest of these acquisitions occurred in 1954, when the state acquired the South Grove and a portion of the Beaver Creek drainage.

As property was acquired, the department added facilities needed for proper management and to facilitate public use. Many of these facilities, ranging from buildings to culverts, where built by the federal Civilian Conservation Corps during the Depression Era, and as such are of great historic significance. Other facilities added by the department at various times in the past also reflect distinct styles of architecture that are also of interest.

Major public use facilities include two large family campgrounds (the North Grove and Oak Hollow), a separate group campground, two large picnic areas (near the Stanislaus River and Beaver Creek), a new visitor center, and a special-use building: Jack Knight Hall. Administrative facilities include the previously mentioned historic building used as a park office and a large maintenance yard.

THIS PAGE INTENTIONALLY LEFT BLANK

IV. VEGETATION MANAGEMENT HISTORY

A. Vegetation Management Prior to 1969

For centuries the forested lands in the area of the park were naturally maintained by frequent exposure to wildland fires, sometimes occurring as often as every three to five years. This frequency culled most of the young trees that had become established since the last fire, thus preventing the forest from becoming overpopulated with more trees than the available resources could support.

By the beginning of the 20th century fires were rare and fire exclusion had become federal policy. By the 1920s forest fire exclusion had become state policy as well. Due to rapid response, fires within CBTSP were typically suppressed before they could grow to any significant size. The only known exceptions were occasional fires escaped from local lumber mills that swept into the area in and around the North Grove, with one, in 1909, seeming to have spread over much of the North Grove.

Excluding fire from forests initially did result in increased productivity as the forests became more densely populated with young trees, but as the decades passed, problems began to emerge, beginning with the iconic giant sequoia. Managers of sequoia groves, along with the scientists who studied them, noticed a disturbing lack of reproduction for the species. It was already known that the heat from fires on the forest floor stimulated the release of sequoia seeds, but it had been assumed by most experts that the background release of seeds caused by animals, insects, and heat from the sun would provide sufficient opportunity for successful recruitment and long-term stand stability. By the early 1960s, it was realized that this optimistic view was misplaced, and that the sequoia groves had virtually no naturally produced trees younger than about 100 years.

During this time, vegetation management within the park consisted of protection of forests from disturbance, most particularly through the immediate suppression of wildland fires. At the same time, other forest conditions were being noticed that indicated decline in the absence of fire. Ponderosa pines, whose seedlings require ample sun and bare mineral soil, were also not reproducing due to increased canopy cover from overabundant shade tolerant species. Forest diseases and pests were becoming more of a problem as the trees, stressed by the additional competition for resources, were not strong enough to resist attack. And finally, the prolonged lack of fire allowed forest fuels to reach extremely high levels, often in excess of 80 tons per acre, resulting in a condition that could result in extreme fire behavior.

B. Vegetation Management After 1969

1. Developed Area Vegetation Management

In 1969 California State Parks implemented the tree hazard program which identifies trees in developed areas that are likely to fail within the next two years, and that have the potential to result in property damage or personal injury. In 1980 the department commissioned a study by the USDA Forest Service of the overall forest health in developed areas at CBTSP, especially in the two campgrounds. This study identified a particular increase in white fir populations in these areas (due to the lack of periodic fire), and a related increase in the occurrence of forest diseases and declining conditions commonly resulting in overcrowding. The report recommended the aggressive thinning of trees in developed areas, with special focus on the removal of white firs (CBTSP files). This was done in the campgrounds and administrative areas throughout the 1980s, and began in day use areas in the 1990s.

2. Wildland Area Vegetation Management

a. Prescribed Burns

CSP began a program of prescribed burning at CBTSP in 1975, the first established by the department in any unit (Table 1). The initial burns were conducted within the Calaveras South Grove, with the intent of restoring fire specifically to the giant sequoia ecosystem and to stimulate reproduction of the species.

The burns in the South Grove were conducted with a great deal of caution, with each of the over 1,000 giant sequoias having a line raked around the bole to mineral soil. By 1981, virtually the entire grove had been treated with fire. At this time the burn program extended to projects outside of the South Grove. By 2011, approximately 40% of CBTSP had been treated by at least one prescribed burn.

History of Prescribed Burns at CBTSP

Year	Location	Acres	Hectares
1975	South Grove	94	38
1976	South Grove	434	176
1977	South Grove	503	204
1980	South Grove/North grove group camp	420	170
1981	MU*-North Stan Se Moran/MU-West Boundary	156	63
1986	MU*-North Stan Se Moran/South Grove	350	142
1995	South Grove	275	111
1999	South Grove	72	29
2000	South Grove	203	82
2009	South Grove	200	81
2011	South Grove	35	14
2011	Railroad Grade Sugar Pine Grove**	37	15
Totals		2779	1125

* Management Units, see Figure 9

** Also known as the Big Tree National Forest (BTNF)

Table 1. History of Prescribed Burns at CBTSP.

b. Succession Management

By 1983, it became apparent that the re-introduction of low intensity prescribed fire, was not a robust enough disturbance to directly restore forest ecosystems at CBTSP. To be effective, fires would need to both reduce overall fuel loading and restore forest stand densities to ecologically sound levels. Stand densities in the western mid-slope of the Sierra Nevada had increased dramatically after fire suppression, from an average of 142 stems per acre (351 stems per ha) (North, 2012), to sometimes nearly 400 stems per acre (988 stems per ha). This recognition caused the resource management program at CBTSP to shift from a primary reliance on fire as a restoration tool, to the use of manual and mechanical methods for stand restoration with fire being a subsequent tool to maintain the results. This most often means the removal of shade tolerant species, primarily incense cedar and white fir that has become dominant in forests previously dominated by pines.

Due to funding and resource limitations, the focus of successional restoration has been on the most important and vulnerable plant communities: giant sequoia groves, old growth ponderosa pine dominated forests, and black oak/ponderosa pine stands. Funding became available for such restoration from a variety of sources, not always based on the highest CBTSP priorities, but always on demonstrable benefits. Thus, mitigation requirements for black oak impacts on Caltrans State Route 4 projects allowed CBTSP to restore over 120 acres (48.6 ha) of black oak dominated forest in the park during the 1990s and early 2000s. Funding from various other sources also allowed CBTSP resource managers to restore forest structure along park boundaries as part of a larger community fire protection system. A grant from the Sierra Nevada Conservancy continues to allow forest restoration efforts in the North Grove giant sequoia forest. Since 2011, the resource management staff utilized a combination of manual thinning and pile burning, in which the biomass of thinned trees is left on site in burn piles that are allowed to dry and burned when conditions allow.

Thus far, manual treatment thinning implemented by hand crews has not been efficient at achieving desired stand composition or density goals. The felling and removal of mature overstory trees is a time consuming process and is only performed on a limited basis by manual labor. However, removal of shade tolerant overstory trees is required to restore the forests of CBTSP to a historic stand composition and density. Manual crews have been effective in reducing understory ladder fuels and ground fuels creating more fire resilient stands.

3. Non-Native Species Control

For purposes of this section, only non-native vascular plants will be discussed as feral animals are not an issue for CBTSP at this time. The only important non-native disease – white pine blister rust – will be discussed in a subsequent section.

As of 2016, CBTSP has not been severely impacted with invasive plants. A few specimens of yellow star-thistle *(Centauria solstitialis)*, which were discovered and removed over 15 years ago, and Scotch broom *(Cytisus scoparius)* are moving upslope and are now within a few miles of the park as of 2016. Three other invasive plant species found within the Park are; goat's beard (*Aruncus dioicus*), velvet grass (*Holcus lanatus*), and Indian sweet clover (*Melilotus indicus*). However, in terms of plants that have been a direct and ongoing problem, there are only two: bull thistle *(Cirsium vulgare)* and common mullein *(Verbascum thapsus)*. These two invasive species have responded well to control efforts in the past, the former being commonly found in areas that have been recently disturbed (especially where prescribed fires burned with great intensity), and – in the case of the latter – moist areas such as the North Grove Meadow, the Beaver Creek riparian zone, and Oak Hollow Campground.

Control of these two species has been achieved by hand pulling or grubbing with hand tools. However, if the plants have gone to seed, then the additional step of clipping and bagging the flower heads must be taken. Bull thistle is also biennial, meaning that it takes two years to grow from seed to maturity, and this requires that known locations of infestation be inspected for at least two consecutive years in order to insure that control has been achieved. Bull thistle also prefers disturbed areas, and is often found within a few years following management actions such as prescribed burning or construction. This characteristic offers some degree of predictability of where new infestations may be located. Also, bull thistle infestations from outside the park often provide a seed source that lead to infestation, and this is a particular problem in the Beaver Creek drainage where off-park timber harvesting provide a seed source that can infest stream-side soils disturbed each year by spring run-off flooding.

a. White Pine Blister Rust

White pine blister rust (WPBR) is an invasive, non-native disease that affects the five-needle (white) pines, including the sugar pines of CBTSP. It is a fungal disease whose spores invade through the needles of the tree, extending their hyphae through the branches towards the main bole, which, if they are able to reach it, can essentially girdle the tree at that point. Native North American white pines have no resistance to the rust, although a small portion of the populations display an ability to survive, not due to resistance, but due ironically to a small portion of individual trees being hyper-reactive to the infection, to the point where the site of invasion immediately dies and thus seals off further spread. This type of reaction only occurs in about 5% of the populations of sugar pines at CBTSP. In the Mediterranean climate of CBTSP, WPBR outbreaks are episodic in nature, mostly occurring during years with above average precipitation, especially in spring (S. Bakken, CSP Forester, per com).

The threat to sugar pine is so acute that many agencies, have sought to identify those 'resistant' trees and bank their seeds as often as possible. AT CBTSP, the process of selection was directed by the following guidelines:

- Sampling was spread as evenly as possible throughout the park, in order to eliminate any secondary genetic screening based on local in-park variation. A four hectare (ten acre) plot was used to create a grid work of sample locations, with at least one tree collected from each square, if access and the presence of suitable candidate trees allowed. Out of a possible 650 collection squares, over four hundred were selected, with over 450 trees actually sampled.
- Sampled trees were initially preferentially selected through the absence of any browned, dead limbs, no matter how small, as a possible indicator or a possible WPBR infection site.
- Large, 'old growth' sugar pines were generally not selected if suitable smaller trees were available. This stratification was included due to the difficulty in collecting cones from very large and tall trees, and the possibility that such trees might be nearing the end of their normal life span.

In the early 1990s, 38 such trees were identified, although two have subsequently died from other causes. The forests around identified trees have been selectively thinned of nearby trees, for two specific reasons. First, thinning of trees immediately adjacent to resistant ones limits access to the desired sugar pine cones by western gray and Douglas squirrels that feed on the seeds. Secondly, thinning reduces competition for ground water, thus increasing the long-term viability of the subject trees. Finally, in an additional effort to reduce cone herbivory, a wide protective band of aluminum is placed around the bole of resistant trees several feet above the ground to reduce access. In areas of high public use, especially along trails and roads, these metal bands are painted to blend in with the tree bole. When possible, identified trees are permanently rigged with a haul line that can be used to raise a climbing rope across higher branches.

Collection of seeds from these trees requires climbing, and this is done whenever both funding and an abundant cone crop are available. Savings have been realized by sharing collected seeds with various agencies better equipped to conduct such collection. Currently collected seeds are stored and frozen by Cal Fire at their Davis facility, and none have been used in plantings within CBTSP due to a lack of funds, a lack of opportunities, and a lack of an agreed upon plan for their use; i.e., whether to proactively create strategically located clearings where planting can be done, or to wait for such clearings to be created naturally through fire, blow-down, or insect mortality.

V. WILDLAND AREA VEGETATION MANAGEMENT PLAN

There are two basic types of forest restoration approaches: *structural restoration* which focuses on recreating historic stand structure through mechanical thinning, and *functional restoration* which prioritizes the ecological processes (Stephenson, 1999). The major, overarching goal of the Vegetation Management Plan (VMP) is functional restoration, restoring the ecological processes that naturally manage the park's vegetative communities. Of these, the most important is the frequent occurrence of wild land fires, but others include such processes as storm damage, insect attack, and flooding. However, restoration of natural processes may not always be possible, especially in developed areas, and in forest stands that have been greatly altered from historic conditions due to a century and a half of fire exclusion. It is recognized that much of CBTSP's forested lands, have changed significantly in their structure and composition. Therefore, resource managers are now required to implement functional restoration through manual or mechanical means coupled with the use of prescribed fire. Once this restoration is accomplished the desired condition will be a forest that is as functionally restored as possible and maintained by prescribed fire, managed wildfire when possible and, with the use of manual or mechanical thinning as necessary.

The terrain of CBTSP is complex, ranging from steep river canyons to ridgelines and slopes of varying aspect and gradient. This topography dictates the soil type and depth directly relating to water holding capacity and thus productivity of sites (Underwood et al., 2010). Historic reconstruction studies of forests under frequent fire conditions have found that forest structure and composition varied with topography and aspect on stand and landscape scales (Taylor and Skinner 2004; Hessburg et al., 2007). Figure 4 is a schematic providing a visual explanation of historic forest stand variability. Because these variations of topography and aspect dictate tree composition, density and canopy cover, different areas of the park will require distinct arrays of management action. Currently, the most scientifically defensible approach to delineating forests based on the above criteria is the Landscape Management Unit (LMU) presented by Underwood et al., 2010, and North 2012. This method uses Geographic Information Systems (GIS) to spatially parse the landscape based on topography and aspect. Applying this method creates nine management units. Using historic stand reconstruction data, desired condition goals for each unit have been developed, creating an ecologically meaningful approach to direct forest treatments. The detailed LMU plan for CBTSP is presented below in section A.

Overall this VMP must strive to meet multiple objectives pertaining to sensitive species, fuel reduction, water and carbon storage, and ecosystem restoration. For instance, some wildlife species require dense stands with high canopy cover for nesting habitat while fuel reduction goals may call for less dense stands. It is imperative for the goals of forest health, fire resilience, and wildlife habitat conservation to be considered in all treatment plans.

Furthermore, management plans need to be flexible to adapt to uncertainties, such as climate change and catastrophic wildfire. With this in mind, a set of general goals and objectives are listed in section B below.

A. Landscape Management Units of CBTSP

The map of CBTSP LMUs was created using a free GIS Landscape Management Unit Tool downloaded from UC Davis (Boynton, 2015). This tool divides the landscape into three classes of slope position (ridgetop, midslope, canyon/drainage bottoms) (Figure 4) and three classes of aspect (northern 330°-120°, southern 150°-300°, neutral 120°-150° and 300°-330°) (Figure 5)(Boynton, 2011). Combined this creates nine LMUs (Figure 6). The nine LMUs are: neutral canyon, neutral slope, neutral ridge, northern canyon, northern slope, northern ridge, southern canyon, southern slope, and

southern ridge (Table 2). The classes of aspect were defined by the amount of solar radiation received. Hence the northern classes will have more shade and will be potentially wetter and cooler than the southern classes. The slope position classes typically represent soil type and moisture availability with canyons having the richest soil and most available moisture. Ridges, with their shallow rocky conditions, typically have the least moisture, and mid-slopes vary between those two extremes. Therefore, the LMU, northern canyon, will have the most available moisture and also the most shade with cooler microclimate conditions and lower historic fire severity and frequency. The forests in this LMU should have the highest basal area (BA) and percentage of shade tolerant species in the park versus the southern ridge that will typically be the warmest and driest dominated by shade intolerant pines and oaks with far lower BA measurements (Underwood, 2010). The distribution of slope position class throughout CBTSP is slightly dominated by mid-slope with canyon, mid-slope and ridge classes comprising 27.2%, 39.4% and 33.4% respectively. Aspect on the other hand is dominated by the southern class at 48.4%, northern 26.5%, and neutral 25.1% (Table 2).

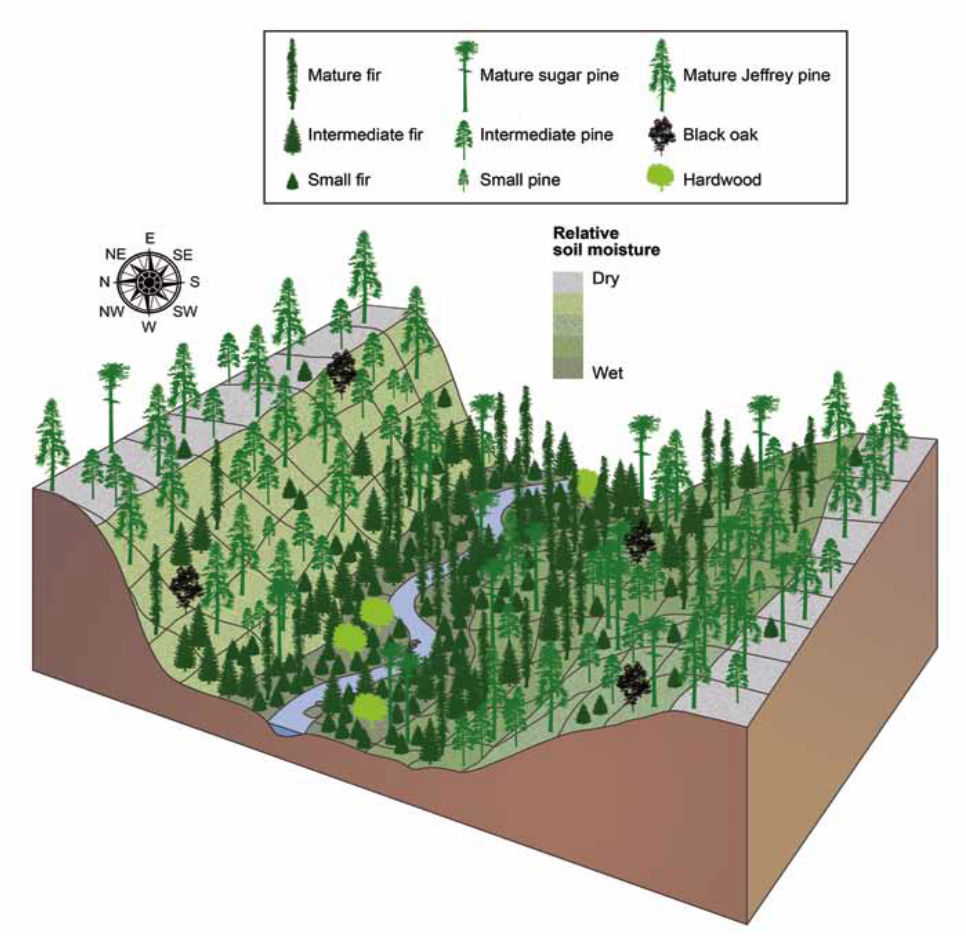


Figure 5-Landscape schematic of variable forest conditions produced by management treatments that differ by topographic factors such as slope, aspect, and slope position.

Reconstruction studies of pre-fire suppression stand density and composition have found historic Sierran mixed conifer forests had an average basal area (BA) of 224ft²/acre (51.5m²/ha). Historic overall stand composition was split evenly between shade intolerant species (pines) and shade tolerant

species (fir and incense cedar) (North et al., 2007). Although historic figures should be used with caution because with factors such as climate change, historic conditions may never return, this average BA target and stand composition is used to determining goals for each LMU (North, 2012). Table 3 is a list of objectives for each LMU. These targets are averages for the entire LMU stand. Within stand heterogeneity will still be created with dense patches of trees surrounded by open gaps interspersed with mature trees that together will average out to the target BA.

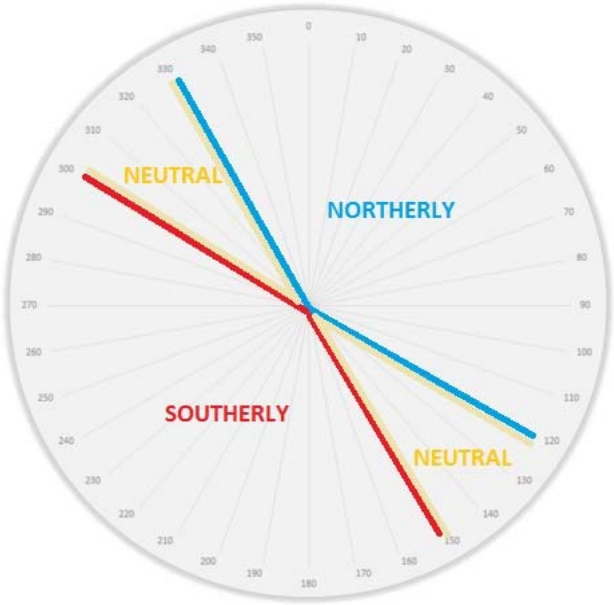


Figure 6-LMU aspect categories by degrees.

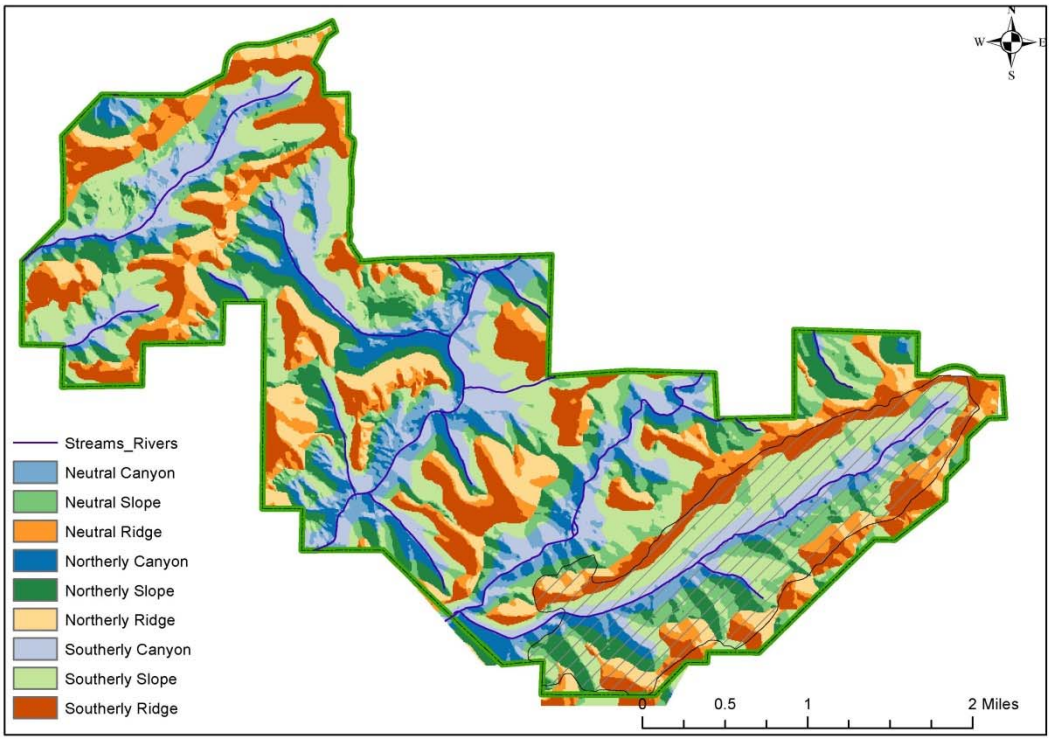


Figure 7-Landscape Management Unit map for CBTSP.

LMU	Area acres	Area hectares	% of Park
Neutral			25.1%
Canyon	466.96	188.97	7.1%
Slope	649.08	262.67	9.9%
Ridge	521.77	211.15	8.0%
Northern			26.5%
Canyon	455.72	184.42	7.0%
Slope	684.82	277.14	10.5%
Ridge	593.34	240.11	9.1%
Southern			48.4%
Canyon	855.89	346.37	13.1%
Slope	1241.41	502.38	19.0%
Ridge	1062.67	430.05	16.3%

Table 2. LMU distribution in CBTSP.

In Table 3, “Desired Conditions” percentages relates to the dominant and co-dominant overstory species. Shade intolerant species primarily refers to ponderosa pine and oak species. Giant sequoia, also a shade intolerant species is not to be managed under these guidelines as it is a “plant species of special concern” (section V.B.1.a below) and where they exist should be the dominant species by basal area (Table 4). Shade tolerant species primarily refers to white fir and incense cedar. Other shade tolerant species such as dogwood, big leaf maple, white alder, and Pacific yew are mainly understory species and therefore not considered under desired conditions. Sugar pine is a species that is intermediate between shade tolerance and intolerance. It is also an iconic species at CBTSP and is threatened by white pine blister rust. In general, healthy representatives of all age classes of sugar pine should be retained in all LMU’s where they are currently found throughout CBTSP. Choose to remove white fir and incense cedar before sugar pine to achieve desired stand density.

By creating stand density and composition targets per LMU, forest heterogeneity on a landscape scale will be achieved (North, 2012). This approach will also allow for more effective prioritization of projects and allocation of forest restoration funding. Basal area measurements can be taken throughout the Park and compared to the targets in Table 3. Priorities for treatment will be determined by the degree to which the existing conditions deviate from the desired conditions. This approach will help in assigning priorities should resources be insufficient to complete the entire planned project.

LMU	Target BA ft²/acre (m²/ha)	Desired Condition	
		% Shade Intolerant	% Shade tolerant
Neutral Canyon	300 (68.9)	30	70
Neutral Slope	230 (52.8)	50	50
Neutral Ridge	160 (36.7)	80	20
Northern Canyon	320 (73.5)	10	90
Northern Slope	260 (59.7)	30	70
Northern Ridge	200 (45.9)	70	30
Southern Canyon	280 (64.3)	50	50
Southern Slope	160 (36.7)	70	30
Southern Ridge	120 (27.5)	90	10

Table 3. Target basal area (BA) and general stand composition per LMU.

B. Desired Conditions (Objectives) for long-term vegetation management

The ecosystem approach to forest management attempts to accomplish the multiple goals of: forest health, resilience to catastrophic wildfire and sensitive species habitat management. Although these

goals may seem contradictory to each other, historic Sierran forests were heterogeneous in nature and simultaneously provided for wildlife habitat while maintaining a diverse healthy stand resilient to large catastrophic wildfires (North et al., 2007). Following are guidelines that will be applied to all LMUs and will guide restoration efforts to create within stand heterogeneity, providing for wildlife habitat, forest health, and fire resilience.

In general, the desired stand conditions are:

- Old growth trees and old growth candidate trees will be retained along with select clumps of dense vegetation, snags, large downed logs, and pockets of coarse woody debris.
- Forest stands will be multi storied and clustered with trees of interlocking crowns separated by sparse trees or open gaps of between ¼ and ½ acre (0.1-0.2 ha) in size, at a rate of approximately one per every 2-10 acres (0.8-4.0 ha)(North et al., 2009).
- Re-establish and perpetuate a natural vegetative mosaic of age classes and species. These mosaics were originally created by soil and soil moisture factors, topography, slope, the frequency, season, and intensity of fires, and openings created by insects, disease, wind throw, and fire. Fire history analysis indicates that, without fire suppression, fires would burn the park about every 12-17 years (McKelvey et al. 1996).
- Retain snags with largest relative diameter or with evidence of prior animal use at a rate of 3-12 per acre (7-30 per ha).
- As much as possible, retain defect trees (decadent, broken topped, large candelabra lateral branches, or malformed). These rare structures are some of the most important habitat for wildlife species (North et al. 2010).
- Retain all trees with occupied nests.
- Adjacent to riparian and hardwood areas, remove or thin encroaching conifer as feasible to promote riparian and hardwood vegetation.
- Retain intermittent dense clumps of diverse vegetation where feasible, specifically on north slopes and in canyons. Size and shape of retained clumps should be irregular and variable.
- Retain large downed logs at a rate of 3 to 12 per acre (7-30 per ha). Naturalize the appearance of logs to be retained by under-slashing cut ends. Remove and cleanup limb wood from down logs, except leave dead limbs attached on the largest downed logs to achieve a balance between fire fuel and wildlife habitat.
- Giant sequoia groves will be maintained with treatment methods and/or naturally occurring wildfires to prevent an overabundant regrowth of dogwoods and other shade tolerant species and to create gaps necessary for giant sequoia regeneration.
- The North Grove Meadow will be maintained by encouraging moisture retention and limiting the intrusion of woody species.
- Control introduced plant populations within the park.

1. Plant Species of Special Concern

a. Giant Sequoia (*Sequoiadendron giganteum*)

Calaveras Big Trees State Park may have not been established if it was not for the presence of this iconic species, and as such it warrants a level of attention that is not provided to other species. Historic stand reconstruction data suggests that giant sequoia grove composition was dominated by white fir

which accounted for 41% of trees in one study plot from 1900-1901 (Stephenson & Elliot-Fisk, 1998) to up to 83% in the Muir Grove in 1971 (Rundel,1971). Sugar pine and giant sequoia made up the second and third most abundant tree species by individuals in most giant sequoia groves (Stephenson, 1999), but at the North and South Groves of CBTSP in 1971, incense cedar is the second most abundant followed by giant sequoia then sugar pine. By size, giant sequoias dominate the stands covering close to 66% of the basal area (Table 4) (Rundel, 1971).

	White fir	Incense cedar	Giant sequoia	Sugar pine	Ponderosa pine
North Grove-stem count	53.7%	36.6%	5.0%	4.5%	0.2%
North Grove-basal area	15.5%	10.9%	65.9%	7.6%	0.1%
South Grove-stem count	73.4%	13.8%	5.7%	7.1%	
South Grove-basal area	21.7%	4.0%	64.3%	9.9%	

Table 4. 1971 tree composition (>12.8cm (5 inches) dbh) by number of trees (stem count) and basal area for the CBTSP North and South Giant Sequoia groves (Rundel, 1971).

When treating giant sequoia groves, this historic composition should be considered. However, without frequent fire, canopy gaps with bare mineral soil have become absent (Stephenson, 1999). These conditions are necessary for giant sequoia regeneration. Management of these groves should be based on reducing the number of early to mid-seral shade tolerant species creating gaps with high sun exposure cleared to mineral soil. Prescribed and/or pile burning will be required to create the mineral soil conditions. This strategy should allow for giant sequoia regeneration which is necessary for the continued existence of these iconic groves.
State Parks managers have not been intentionally planning to regenerate the species or indeed expand the range of giant sequoia in the face of global climate change pressures. Not only should the giant sequoia groves be intentionally managed to encourage natural regeneration but the occurrence of giant sequoia should be expanded within new acquisitions of property associated with CBTSP such as within the Big Tree National Forest acquisition; this property already has a few scattered old growth giant sequoias (GS). See section V.C.3.b on giant sequoia seed collection and appendix C.1 for a detailed plan on how to manage for giant sequoia regeneration.

Furthermore, resource managers must include other management actions for the giant sequoia groves much of which can be conducted during the annual inspections called for under the resource maintenance program, and include:

- Population dynamics, including mortality and the condition of pockets of reproduction.
- The impact of visitors, especially on large specimen trees.
- The status of planted or artificially established giant sequoias, especially along the railroad grade near the South Grove.

b. Pacific Yew (*Taxus brevifolia*)

Given the status of the Pacific yew throughout its range, the small population at CBT may be of interest only as a curiosity to even the scientific community, but its status to resource managers at the park is of heightened interest, and goes beyond the obligation to preserve it as part of the park's biotic community. The fact that the entire range of CBTs population occurs within the boundary of the North Grove is certainly notable, as is the fact that the trees do not display the range of size classes commonly associated with the species: large yews can approach 20 in (50 cm) diameter at breast

height (DBH), but none at CBT approach this size, and rarely get larger than 5 in (12 cm) DBH. Management actions specifically related to the Pacific yew follow, some of which are designated as recommendations to be accomplished as opportunities arise.

- Map the existing population of Pacific yew
- As broadcast burns within the North Grove are planned, protect the bases of yews from exposure to heat and flames.
- [Recommendation] When dead yews are identified, collect sample cross-sections for dating.
- [Recommendation] Conduct studies of genetic diversity within the population, and genetic comparisons with the closest population.

c. Stebbins' Desert parsley (*Lomatium stebbensii*)

As mentioned earlier, *L. stebbensii* occurs locally on dry, rocky exposures within the park, and is also included on the CNPS list 1B.1 for rare, threatened, or endangered species in California. CBTSP does not anticipate any management activities that might impact either the species or its unique habitat, but recognizes that threats to a species with such a limited occurrence requires special consideration, and the following is called for under this plan:

- All known locations of *L. stebbensii* will be inspected annually during the early summer.
- No prescribed burns will be conducted near *L. stebbensii* while in bloom unless the populations are specifically protected.
- No entry by mechanized equipment will be allowed onto the sensitive surface of suitable *L. stebbensii* habitat for any reason, at any time.

2. Prioritization

As seen in figure 3, vegetation community map of CBTSP, almost all of the 6,497 acres of the park are forested. Section V elucidated that most of this acreage has been significantly altered due to the suppression of the ecological process, wildfire. These altered forests are densely overstocked with high fuel loading and are at risk from catastrophic wildfire. Under conditions, as of 2016, if a high severity wildfire begins or runs through CBTSP, iconic, irreplaceable vegetative specimens could be lost and a valuable recreation area could be altered which would take decades to centuries to recover. This urgency calls for a plan to direct the limited resources of CBTSP to focus on the highest priority areas of the park. A specific priority plan with hard targets is not presented here but rather a general approach with concepts on prioritization. Often funding sources are specific in nature, for instance, allocated for watersheds or the wild land urban interface. However, with the LMU tool and the criteria presented below, it is anticipated that stands with the most need of restoration can be focused on. Following are three criteria to determine priority areas within CBTSP.

d. Iconic Areas

The giant sequoia trees of the North and South Groves are the reason CBTSP was created and what the Park was named for. These massive old growth trees naturally occur only in the Sierra Nevada scattered amongst 75 groves (Piirto and Rogers, 1999), and as such, must be placed as the highest priority for forest restoration. These groves have received the bulk of previous treatment efforts (see section IV.B.2.a) but must continue to be monitored and maintained. The giant sugar pine forest (also known as Big Tree National Forest), north of the South Grove Natural Preserve (Figure 7), at around 440 acres (178 ha) is one of the largest remaining old growth stands of sugar pine dominant forest in

the Sierra. Some manual thinning and prescribed burning has been accomplished in this stand (75 acres between 2012 and 2015), but much work remains to be done especially in the eastern half of the unit.

The riparian areas of CBTSP provide a valuable resource far beyond the borders of the park. The North Grove meadow is the only remaining montane meadow in the park and is an integral part of the hydrology of the North Grove and Big Tree Creek.

Finally, the developed areas of the park must be considered high priority as they allow CBTSP to fulfill its mission "To provide for the health, inspiration and education of the people of California…".

e. Topography

As seen in figure 5, LMU map, the red, orange and yellow represent ridgelines and the dark green, the southern slopes. These areas typically receive the most solar radiation and have the least moisture availability. Historically these areas burned frequently and had the lowest stand densities in the forest. With the current high fuel load conditions, these areas will be the most likely to carry and increase fire behavior. Furthermore, these areas dissect the park into multiple smaller sections of denser stands. Focusing forest restoration efforts in these LMUs and achieving the target BA set forth in table 3 may be one of the best approaches in reducing the spread and intensity of severe crown fires that have become more common in the current fire suppressed landscape. The thinned out ridges will become natural fuel breaks. It is important to maintain these areas by recreating a natural fire regime with frequent prescribed burns, keeping fuel loads to a minimum.

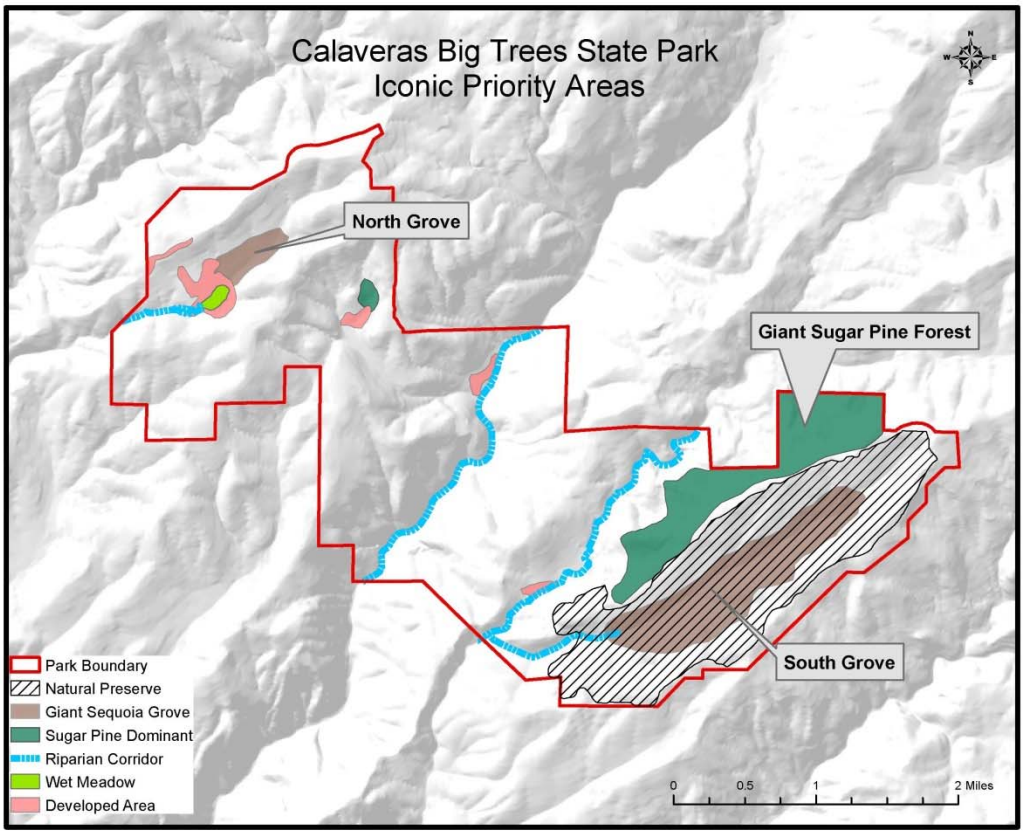


Figure 8-Iconic high priority locations in CBTSP.

f. Stand Density

Table 3 delineates the target basal area for each LMU. When project areas are defined, stand surveys must be conducted to determine the existing basal area for each LMU. Stands that are the furthest from target conditions can then be prioritized.

The above criteria can be used as a decision tree in targeting restoration efforts where they are needed the most. First, plan restoration projects for high priority iconic areas. Within these areas, focus on topographic features, such as ridges, that can help create a fire resilient forest, then further focus on stand densities to maintain forest health. Once all of the iconic areas have been treated, the second two criteria can be used to prioritize work throughout the rest of the park. This focused effort is necessary with the amount of acreage in need of restoration. Current hand crews performing manual thinning complete between 50-70 acres (20-28 ha) per year. This does not include pile burning, prescribed burns, or the removal of larger trees to accomplish desired stand density and composition. This rate of treatment does not keep up with accumulating fuels from forest growth, leaving most of the Park's forest in high fuel load conditions, susceptible to catastrophic fire events. If the historic fire regime for the forests of CBTSP was12-17 years (McKelvey et al. 1996), then between 400-600 acres (162-243 ha) must be treated and burned each year. To even partially achieve this goal, increased funding must be allocated and mechanical thinning methods used.

C. Treatment Methods

Various methods can be used in an effort to restore ecological balance to the forests of CBTSP. As a rule, however, those methods that most closely replicate the effect of fire will be preferred. Whenever possible, methods that create the least secondary impact will be used.

Herbicide use as a forestry management tool (outside of Non Native Species Management V.C.2.) is not being considered at CBTSP. Herbicides are usually used in forestry to temporarily suppress undesirable competing trees and shrubs, while the desired tree species are in the seedling stage. Since we are not contemplating large clear-cuts there will be no necessity to prepare to utilize this tool for that purpose (S. Bakken, CSP Forester, per com). Furthermore, as stated in the CBTSP General Plan, "Use of herbicides is discouraged, unless all other practical methods or removal have proven to be ineffective." Also, using herbicide to suppress native vegetation contradicts managing the ecosystem as a "composite whole" (DOM § 0304.1), as the herbaceous understory provides integral habitat for a diverse fauna.

Grazing as a tool to reduce vegetative biomass, is a forestry practice utilized by other agencies. The California State Park and Recreation Commission's Statements of Policy, considers grazing to be incompatible in units of the State Park System, however; grazing may be included in a general plan as a tool for resource management. Cattle, sheep, goats, and other agricultural grazers are not "indigenous" to the Sierra Nevada, are not a part of "native environmental complexes" (PRC § 5019.53(a)), and is not consistent with maintaining "conditions in as nearly as possible the natural manner that would have occurred in the absence of all interference by Euroamerican people" (CBTSP General Plan). As of this version of the Vegetation Management Plan, grazing is not being considered as a vegetation management tool at CBTSP.

1. Succession Management

a. Prescribed fire

Prescribed fire is the preferred method for the maintenance of ecologically sound forests at CBTSP, but is only effective if it is applied per the fire return interval based on the historic fire regime. In essence, this means that some portions of a burn unit should be allowed to burn with higher intensities that would be desirable for most of the unit, and absolutely undesirable around the unit's perimeter. This runs counter to the manner in which earlier prescribed burns were conducted at CBTSP when great efforts were made to keep fire intensities uniformly low. Allowing for varied intensities results in a more varied forest structure, creating a mosaic pattern of different age classes, species diversity, and stand densities. By the same token, allowing attempts to extend burn coverage to as close to 100% of the unit as possible is also no longer considered desirable in that it does not reflect the meandering pattern that usually occurred in natural fire events.

Fire history studies in the Sierra Nevada clearly indicate that wildland fires typically burned in late summer into the winter months, with few (5%) of fires occurring in the spring or early summer. In an effort to mimic the behavior of natural fire events, the same pattern will be used at CBTSP, with the added provision that spring or early summer burns will be limited in size, and applied only in areas where there will be minimal impact to wildlife (especially nesting birds) and flowering plants.

As much of the park as possible should be treated periodically by managed burns, since this most closely replicates the effects and impacts of naturally occurring fire on forest ecosystems. In the attempt to use prescribed fire to replicate the ecological process of naturally occurring wild fires, the prescribed burn program will:

- Attempt to burn on a schedule that the best available science has determined to be the naturally recurring fire return interval and intensity, about every 12-17 years (McKelvey et al. 1996). This will vary along topographical gradients. North facing slopes and valley drainages will have longer fire return intervals, while south facing slopes and ridgetops will burn more frequently.
- The preferred prescribed burning window is late summer to early winter.
- Burn units will be inspected prior to ignition to identify high value old growth trees, especially sugar pines and giant sequoias that might be severely damaged by abnormal accumulations of fuel. The risk will can be mitigated for by raking thick duff layers away from the trunk of the tree and spreading that duff evenly to prevent thick pockets that could burn hot and damage root systems. Alternatively, if the tree is deemed suitable by the project manager, a cavity creation plan can be followed as detailed in appendix C.2.
- Ladder fuels that may ignite during the burn and surround old growth sugar pines and giant sequoias should also be removed, piled and burned in a location that will benefit sequoia and pine regeneration.
- Restore temporary control lines to prevent establishment as social trails.
- Prescribed burns shall be conducted within the guidelines established by CSP.
- Although other agencies may assist in implementation, CSP personnel will always take the lead in planning burns and directing ignition, with the following exception: CSP may contract out for ignition on very complex burns requiring aerial ignition, mostly in steep terrain or in areas where terrain and topography require that burn units be especially large.
- Projects along park boundaries should be small enough to ensure complete spread in one day, and burnout within two days, with suppression if necessary.
- In order to prevent unnecessary soil disturbance, burn units smaller than 10 acres (4 ha) should either be a segment of a series of contiguous units to be treated as a whole, or as a training burn.
- If prescription parameters are exceeded during a burn project further ignition will cease and the burn project may be suppressed.

b. Prescribed fire with pre-treatment thinning

This method will be used when it is determined that the current fuel loads will not allow for a safe and controllable prescribed burn. This would include conditions with ladder fuels and forest litter in such quantity that would allow severe burn intensity to destroy root structure and allow flames to reach the canopies of old growth pines and giant sequoia. Therefore, an amount of manual thinning will be completed prior to the burn, to assure old growth specimens will not be destroyed. This method will follow all of the treatment criteria for prescribed fire listed above and a specified amount of the manual thinning criteria listed below. The amount of thinning will be determined at the project level. The main difference between this method, and that of manual thinning with pile burning, is that the cut slash will be burned during the prescribed burn.

c. Pile burning with pre-treatment thinning

Manual thinning consists of crews removing vegetation determined to be in excess of desired numbers and/or species diversity. Typically this is done with chain saws, both to drop and limb trees, and to cut biomass into sizes that are easily handled, although other hand-held tools may be used. Handling

larger trees becomes increasingly labor intensive in the effort needed to reduce them to sizes that can be easily handled, and also in the amount of time required for such large pieces of fuel to dry enough to be burned on site.

Most trees targeted for manual thinning will be 14" DBH and less, due to the physical limitations of hand labor. These limitations will mean that overstory stand structure will remain mostly unchanged. However, before manual thinning projects commence, a plan will be made striving to achieve a heterogeneous multi canopy forest structure described in section V.B. Thinning of the forest understory and reduction of surface fuels will reduce potential fire intensity and risk of crown fire.

Manual thinning projects will:

- Retain all old-growth trees except hazards to human life, facilities, or fire lines.
- Trees removed will primarily be shade tolerant species of white fir and incense cedar.
- Retain snags with largest relative diameter or with evidence of prior animal use at a rate of 3-12 per acre (7-30 per ha).
- Thin trees 14" to 30" (35.6-76.2 cm) DBH very selectively to achieve desired forest structure and composition. These logs can be left whole as habitat to achieve downed log density per acre target or, if by a road, the logs can be removed. If piling and burning is the only option, then falling trees of this size class will reduce efficiency of manual crews.
- Thin live trees up to 14" (35.6 cm) DBH selectively to achieve desired forest structure.
- As much as possible, retain defect trees (decadent, broken topped, large candelabra lateral branches, or malformed). These rare structures are some of the most important habitat for wildlife species (North et al. 2010).
- Retain all trees with active nests.
- Adjacent to riparian and hardwood areas, remove or thin encroaching conifer, as feasible, to promote riparian and hardwood vegetation.
- Retain intermittent dense clumps of diverse vegetation where feasible, specifically on north slopes and in canyons. Size and shape of retained clumps should be irregular and variable.
- In burn pile areas, cleanup surface fuels 1" to 14" (2.5-35.6 cm) diameter by limbing, bucking and piling for burning.
- Retain logs greater than 14" (35.6 cm) diameter. Naturalize the appearance of logs to be retained by under slashing cut ends and/or by piling debris and burning. Remove and cleanup limb wood from down logs, except leave dead limbs attached on approximately 3 to 12 of the largest downed logs per acre (7-30 per ha), to achieve a balance between fire fuel and wildlife habitat.
- Pile the cut brush into piles, or by elongating piles (windrows), ideally directly up and down slope.

D. Manual thinning with biomass removal from site

Forest restoration projects generate a great deal of biomass, whether in the form of branches and tree tops ("slash"), or larger logs. Whenever possible, slash will be burned on site, preferably in piles or stacked in long rows that emulated the effect of a tree trunk burning on the ground. If slash is to be chipped, piles will be stored in the maintenance yard until dried. The chips will be removed and either used as ground cover in areas of heavy public use, or used for cogeneration when and if this technology becomes locally available.

E. Mechanical thinning and removal of large trees

It is recognized that the efficiency of manual labor is severely reduced when used to remove trees greater than 14" (35.6 cm) DBH. Burning the resulting biomass cannot be easily achieved until the wood has dried, which can take two to three years, and removing the biomass from the site is only practical when it is near roads. Mechanical operations will be used to achieve desired stand density where appropriate, and/or where the biomass is too high to apply broadcast burning or cannot be effectively dealt with through manual treatment. Mechanical operations will be subject to the following provisions:

Tree will be felled and removed in such a way as to prevent damage to residual trees.

- Soil disturbance will be minimized, mitigated and restored at the end of the operation.
- Skid trails and landings will be designated by a registered professional forester (RPF) or someone trained or supervised by an RPF.
- Cleanup will include either full removal, or pile and burn of the vegetative debris.

Currently, the Central Valley District lacks the type of equipment required for mechanical thinning, therefore; this work would need to be contracted out. If contracted thinning is anticipated, it will be under the direction of a State Park Forester or an employee supervised or trained by a Forester. A State Park representative will monitor the contract activities of the entire operation.

"In State Park Natural Preserves, such as the South Grove Natural Preserve, State Parks is required to perform the minimum management requirement (actions) using the "minimum tool" to best preserve the natural values under the given circumstances (Title14, Division 3, Chapter 2 § 4351(2)). "The "minimum tool" is defined as the "least intrusive tool, equipment, devise, regulation, action, or practice that will achieve the minimum management requirements." Furthermore, upon making findings of the use of a minimum management tool to achieve the minimum management requirement the Director or designee, may authorize officers, employees or agents of the Department of Parks and Recreation to occupy and use a particular state wilderness, cultural preserve, or natural preserve within the California State Park System on a case-by-case basis to conduct a minimum management requirement. Therefore, staff will make a recommendation to the Director or designee by providing sufficient background, analysis, data and research to allow the Director or designee, to fairly and objectively evaluate the material considerations for the Findings (Title 14, Division 3, Chapter 2, § 4351 (c))."

Target forest structure will be characterized as clustered, with groups of trees separated by sparsely treed or open gap conditions. Spatial heterogeneity of forest structure will be promoted, including clumped tree distribution and canopy gaps, such as likely would have been maintained by an active fire regime. Remnant old-growth trees, old growth candidate trees, an uneven-aged stand structure arranged in multiple canopy layers, select clumps of dense vegetation, snags, and pockets of course woody debris will be maintained.

Mechanical Thinning Objectives:

- Forest stem density of 100-200 trees per acre (247-494 stems per ha), determined by aspect and topography.
- Overstory Tree Spacing Target: 10 to 30 feet (3-9 m), and clumps with tighter spacing and interlocking branches.
- Retain all old-growth trees except hazards to human life, facilities or fire lines.

- Thin second-growth trees within drip line of old-growth trees, and within potential drip line of old-growth candidate trees, to basal area target range, unless retention is desired for species composition.
- Improve species composition by thinning of second-growth white fir and cedar, and retention of healthy and vigorous pine and oak.
- When not incorporated into clumps, thin live trees less than 14" (35.6 cm) DBH to 10 to 30 feet (3-9 m) spacing, favoring tree size and health, and pine and hardwoods over fir and cedar.
- Retain intermittent dense clumps of diverse vegetation where feasible, specifically on north slopes and in canyons. Size and shape of retained clumps should be irregular and variable.
- Dense clumps of small trees and pockets of course woody debris to be retained should be paired together, where pre-existing forest structure will allow.
- Size and shape of retained clumps/pockets should be irregular and variable.
- Retain snags with largest relative diameter (>14 inches (35.6 cm) diameter) or with evidence of prior animal use at a rate of 3 to 12 per acre (7-30 per ha).
- As much as possible, retain defect trees (decadent, broken topped, large candelabra lateral branches, or malformed). These rare structures are some of the most important habitat for wildlife species (North et al. 2010).
- Downed log retention/recruitment target: 3 to 12 per acre (7-30 per ha).
- Downed logs to be retained will be left intact, with all limbs and root wads protruding to provide wildlife habitat complexity.

a. Girdling

If snag creation is desired then girdling should be considered as a preferred option. Trees chosen to girdle should be too large to easily remove in manual thinning operations and of sufficient size to create a snag suitable for wildlife habitat (> 14" (35.6 cm) DBH). Girdling can also be done for Oak management. Trees that have grown into or pierced the canopy of oaks (or other desirable hardwoods) and cannot be felled due to difficulty/safety can be girdled (J. Suero, CSP Forester, per com). Girdling will be carried out in wildland areas only, so the resulting snag will not pose a threat to visitors or Park facilities.

2. Non-Native Species Management

CBTSP has remained relatively free of troublesome exotic plants and animals. Only two plant species are of ongoing concern (bull thistle and common mullein). Five other plant species have been observed in or near the park: yellow-star thistle (*Centaurea solstitialis*), scotch broom(*Cytisus scoparius*), goat's beard (*Aruncus dioicus*), velvet grass (*Holcus lanatus*), and Indian sweet clover (*Melilotus indicus*).

Specific management actions for invasive species control at CBTSP include the following:

- Eradicate populations of bull thistle within three years of identification.
- Keep common mullein populations contained within existing known locations.
- Develop a digital map for CBTSP with historic locations of bull thistle and mullein.
- Develop a map for CBTSP identifying likely corridors of entry for new alien plant species within the park.
- Identify any new invasions by other plant species within two years of establishment at likely points of entry.

- Known sites of widespread and troublesome species will be mapped and inspected at least once annually, prior to the plant species going to seed, until such time as at least two inspections find no presence at an individual site.
- Recently disturbed areas, especially locations of prescribed burn or pile burn activities, will be inspected annually for at least three years, even if no plants were located.
- Annual inspections will be made of the entire riparian corridor of Beaver Creek.
- As much of the root mass of found exotic plants will be removed as possible.
- Flowers that have mature seeds will be cut, bagged and removed from CBTSP.
- Areas of potential infestation by new exotic plant species will be inspected annually, as determined by the District Senior Environmental Scientist.
- Actively monitor areas around the park, especially to the west and south, for nearby populations of exotic plant species that might establish within CBTSP.

The treatment methods for removal of invasive plants are in preferred order: manual removal, prescribed fire, mechanical removal, and lastly herbicide use.

b. Manual removal

Hand pulling and/or use of hand tools to remove patches of invasive plants as soon as possible after they are discovered are the preferred treatment methods. The plants will be bagged and disposed of.

c. Prescribed fire

Prescribed fire may be considered for invasive species control if it simultaneously achieves forest treatment project goals.

d. Mechanical removal

The use of heavy equipment to remove invasive species will only occur if an infestation becomes too large to control with manual treatment. This would most likely occur in developed areas where the influx of visitors is the vector of invasive species introduction and spread.

e. Herbicide use

The use of herbicides within CBTSP is generally discouraged and the control of invasive species will be attempted by all other practical means prior to consideration (DOM Section 0310.7). However, the application of herbicides should not be resolutely prohibited, but instead should be considered with great care. Herbicide use will be conducted under a licensed applicator and will be target specific. Furthermore, the use of herbicides will only be considered after a separate and specific review under CEQA.

3. Seed Collection and Propagation

f. Sugar Pine

Essential to the effort of CBTSP to manage the existing White Pine Blister Rust (WPBR) and ensure the long-term survival of sugar pines within the park, is the understanding that it requires a long-term commitment of resources to achieve results that may not be identifiable for decades. The current program is essentially dedicated to the accumulation of resources (sugar pine seeds) whose future use is now only theoretical, and will either be reactive to some future event, or may become proactive and anticipatory.

Methods to combat WPBR will include:

- Expand the numbers of sugar pines resistant to white pine blister rust throughout the park, especially in ridge top areas where resistant pollen is more likely to spread, whenever opportunities arise to plant conifers in CBTSP.
- Actively maintain and support trees identified as being resistant to WPBR through forest treatment projects.
- With the cooperation of allied agencies, annually inspect and, if cost effective, collect cones from resistant trees.
- Insure that previously collected seeds are adequately preserved.
- Biennially, review the status of the entire population of sugar pines at CBTSP, and in consultation with CSP foresters, determine whether plantings of resistant trees should be undertaken.
- The collection of cones from resistant trees will be performed solely by non-invasive climbing (without the use of spikes).
- The use of firearms to shoot cones out of trees will not be allowed.
- Protective metal bands placed around resistant trees that are along trails or roads will be painted to reduce their visibility.
- Only trees in low use areas will be allowed to be pre-rigged to install climbing lines.
- Collected seeds may be shared with cooperating agencies to offset costs, but seeds will not be sold or used for any other type of exchange.

Seed Collection and Storage

As mentioned previously, CBTSP has identified over thirty rust resistant trees within the park, and has engaged in a program of collecting cones, and hence seeds from these trees. No effort at collection is made if the cone crop in a particular year is too low to warrant the expense. A large number of seeds have been collected and are currently being cryogenically preserved at one of California Department of Forestry and Fire Protection's State Nursery, L.A. Moran Reforestation Center. It is hoped that this seed reserve will allow the park to respond effectively if mortality to sugar pines by WPBR deteriorates to the point where the natural population is threatened, or if wildfires destroy large stands of sugar pine.

Protection of Rust Resistant Trees includes:

- Annual inspections of WPBR resistant trees will be performed by mid-summer to determine the extent of the current year's cone crop, as well as the number of conelets representing the cone crop for the coming year.
- These inspections will also view the condition of the metal bands placed around the trees to prevent cone predation by squirrels.
- Damaged or failing metal bands should be repaired or replaced by the following year.
- The inspections will also pay attention to the growth of nearby trees that may allow squirrels to either bypass the metal bands or gain direct access from one tree's canopy to another.

g. Giant Sequoia and Ponderosa Pine

If a devastating stand replacement fire enters CBTSP, significant tree mortality could occur throughout large sections of the Park. The overstory conifers of CBTSP do not re-sprout. Therefore, natural conifer regeneration after a stand replacement event will be severely limited due to the lack of a seed source. A method to hasten forest recovery would be planting conifers from native stock. As discussed, seed stock of sugar pine has been and may continue to be collected. However, CBTSP

does not currently have a collection of seeds from giant sequoia or ponderosa pines.

Funding should be sought to collect viable seeds from giant sequoia and ponderosa pine specimens from the North Grove, South Grove, and BTNF. Giant sequoia cones can be collected from the ground. Ponderosa pine cones will be collected in the same method as for the sugar pines, by non-invasive climbing techniques. Seeds should be stored at the L.A. Moran Reforestation Center.

F. Constraints to Achieving Objectives

1. Smoke Management

Smoke management is the process of conducting a prescribed fire under specified fuel moisture and meteorological conditions, and with firing techniques that keep the smoke impact on the environment within acceptable limits. The objective of smoke management is to prevent significant deterioration of air quality from prescribed burning. A smoke management plan will be included in each prescribed burn project plan. Smoke sensitive areas and smoke dispersal will be mapped. Possible problems from smoke will be discussed in the plan. Actions for dealing with such problems will also be addressed.

Smoke generated by prescribed burns or by unplanned wildfires can present a risk to public health if exposure is prolonged and if smoke density is high. Limiting such exposure is an important responsibility that must be taken seriously. Even when exposures are brief and overall smoke density low, park visitors and local neighbors may find smoke impacts unpleasant, and undesirable. Keeping the public informed with up-to-date notifications of fire operations, emphasizing the importance of the burn project, and providing a means of directly expressing any concerns to fire managers are all necessary components of a well-designed project.

It is departmental policy to maintain air and visual resources against significant deterioration DOM 0305). All prescribed burning will be done in compliance with state and local laws, regulations, and ordinances governing air quality. The effects of a series of burns must be considered in relation to the cumulative effect of numerous burns by others in the air basin within the same relatively short period of time.

While the creation of smoke cannot be eliminated, there are several steps that can be taken to keep the smoke from becoming an unnecessarily large problem:

a. Adherence to fuel moisture requirements: If smoke is expected to be a problem, burning can be performed when the fuel moisture stick readings are at the low end of typical prescriptions, 8 to 9 percent. Combustion of dry fuels is more complete and particulate matter size smaller, than that of moist fuels. The Prescribed Burn Boss must be careful not to sacrifice safety from fire escape to minimize smoke by this means.

b. Limiting the size of the burn: Large burn units can usually be divided into small sub-plots that can be burned in a single day. This offers the opportunity to limit daily smoke emissions by reducing the chance of overnight generation. If conditions allow, these larger units might then be treated in a series of single-day projects.

c. Anticipation of smoke behavior using weather data and fire weather forecasts. Weather forecasts can be obtained from meteorologists at the National Weather Service, either through their daily fire weather forecast, or through a requested spot weather forecast for a specific location. Spot weather forecasts are interactive, as meteorologists prepare and refine the forecast based on reports from burn managers regarding the actual weather readings taken each day, and comparing these data with predicted values.

d. Patrol during the burn to evaluate smoke dispersal: Despite adequate precautions, smoke from a prescribed fire may impact public use areas and nearby communities. A smoke monitor will determine if such impacts are happening, and will then notify the burn boss, who will take actions as defined in the smoke management plan.

e. Burning minimal amounts of green material: The moisture in green material carries high amounts of particulate matter into the air, which is most likely to be a problem during rare spring burn operations.

f. Burning when the transport wind carries the smoke away from smoke sensitive areas: Sensitive areas within the unit should also be considered.

g. Termination of the burn if smoke behavior is undesirable and unable to mitigate.

Examples of smoke sensitive areas are populated areas, traveled roads or highways, airports, hospitals, and schools. Their potential as targets for smoke impacts varies depending on terrain, elevation relative to the smoke source, and time of day. Special care must be used when smoke impacts State Route 4 and traffic will be controlled if necessary.

There are two general patterns of smoke dispersal: smoke drift carried by transport winds, typically southwest to northeast and nightly smoke flow, typically downslope and down-canyon to the southwest. Such areas vary significantly between the northern and southern areas of CBTSP (Figure 8). In the northern area, State Route 4 passes through the northwestern edge of the park. Located near the highway are the North Grove Campground, the Visitor Center, park residences and offices, the North Grove parking area, picnic area, and Interpretive Trail, and the park maintenance yard. Nearby residences are at Big Trees Village on the northeastern boundary and Blue Lakes Springs Subdivision on the northwest boundary. The communities of White Pines and Arnold are located within 3 miles (4.8 km) of the park boundary along State Highway 4. Oak Hollow Campground and scattered trailheads and picnic areas are located along the Walter W. Smith Parkway. Many of these areas are potentially subject to smoke impacts during the day if the fire is nearby, or at night if down slope and down canyon air drainage carries the emissions in that direction. The southern area of CBTSP in Tuolumne County contains no adjacent smoke sensitive areas. The South Grove Trail is lightly used by visitors and there are no public roads. Regardless, downslope smoke drainage at night has occasionally resulted in smoke drifting into Forest Meadows (downslope from Arnold and between the Stanislaus River and State Route 4), and rarely into Murphys, Angels Camp, or even San Andreas.

Prescribed fire treatments in the southern part of the park from 1975-2011 rarely resulted in unsatisfactory air quality. However, in the North Grove area, smoke occasionally impacted the numerous nearby smoke sensitive areas. It should be noted that atmospheric patterns may carry smoke in different directions regionally, and that dispersal may be limited, so that the impacts of prescribed burn generated smoke may create long-distance, but intense, impacts that are not easily modeled.

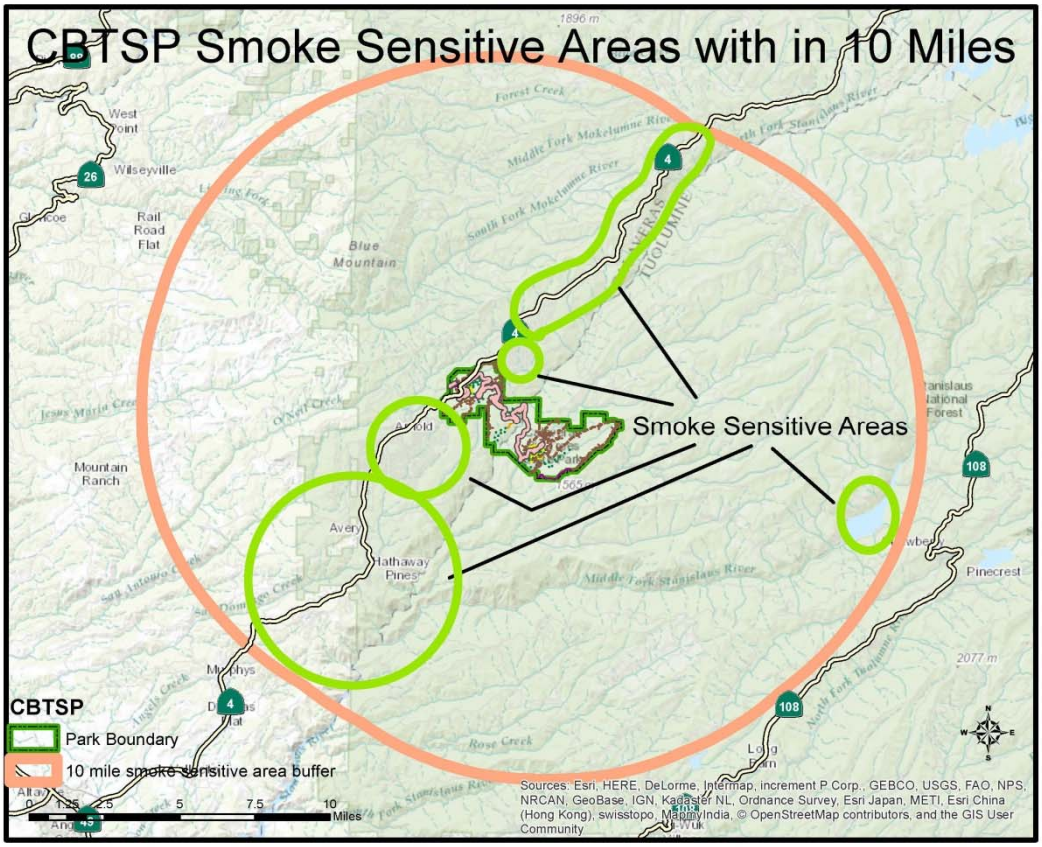


Figure 9-Smoke sensitive areas within 10 miles of the CBTSP boundary.

2. Wildlife

Vegetation management programs at CBTSP should have an overall enhancing effect on wildlife resources by increasing habitat diversity, and thereby expanding opportunities for occupation, and utilization, by more species of animals. It is to some degree possible that the immediate implementation of a vegetation management project may inadvertently have a negative impact on wildlife populations, even if only for a short time (Long et al, 2014). Resource managers must try to predict and either avoid or reduce these impacts, during both the planning and implementation process for each project.

Special concern shall be given to minimizing or avoiding disturbance during breeding and nesting seasons especially for sensitive species such as the California spotted owl and the northern goshawk. If impacts during nesting season are unavoidable then pre-project surveys will be conducted to determine occupancy and nest locations. Occupied nests will be given a buffer within which no work will be conducted during the nesting period. The protocol for California spotted owl surveys that is recognized by the California Department of Fish and Wildlife is found in, “Protocol for Surveying Proposed Management Activities that May Impact Northern Spotted Owls, revised 2012. The northern goshawk survey protocol is found in chapter 3 of the “Northern Goshawk Inventory and Monitoring Technical Guide” by Woodbridge and Hargis, 2006. It requires two nesting seasons to complete

protocol surveys for both species prior to project work commencement.

Impacts to riparian areas and wetlands should be avoided to prevent disturbance of sensitive songbird and amphibian species. Forest mammals, including rare predators (American martin and fisher), and several bird and bat species (including the Townsend's Big Eared Bat) rely on specific forest structures for nesting, resting and foraging habitat. These structures include: snags, tree cavities, defect trees, large downed logs, and dense multi canopy patches of trees with interlocking branches. Tree cavities that are currently shaded in dense stands should remain shaded as removing the cover will reduce its habitat quality. Larger mammals require forage, cover and corridors for travel. Areas of dense shrub and herbaceous understories should be retained for this purpose.

All forest restoration projects must balance the need for forest health, fire resilience, and wildlife habitat. Since wildlife at CBTSP have evolved for centuries with a forest structure created by an active fire regime, if the goals and treatment methods outlined in this plan are followed, this balance will be achieved.

3. Cultural Resources

Departmental policy requires that a cultural resource survey be performed prior to any management action. DPR policy provides for cultural resource review for all projects, and documentation of that review. In 1975, when DPR began its program of prescribed burning in the South Grove, site specific reviews were conducted as needed, but it became apparent that, as plans for expanding burn activities throughout the park began, a systematic and unit-wide survey would be necessary. This was conducted in the early 1980s (DPR 1989). Although this survey was prepared in response to anticipated prescribed burn activities, it is equally useful in planning for other management actions.

While preparing the CBTSP General Plan, departmental archeologists surveyed key areas of the Park. This survey recorded over 36 Native American Sites and 11 historic sites. For security reasons, these sites are not delineated in this plan. If not carefully managed, various vegetation management activities may result in irreparable damage to cultural features. To prevent such an occurrence, cultural and natural resource managers will work together in planning management actions that will protect known sites, and will take reasonable and necessary steps to limit potential damage to as yet undiscovered sites. However, in this latter case, it is noted that the protection of possible (but unrecognized) cultural features should not be used as a reason for preventing the use of treatments recognized as established and reasonable management actions.

Since the 1989 CBTSP General Plan, archaeologists investigated the Big Tree Cottage site, a large indigenous habitation site, and guided restoration and protection of the 1852-1942 North Grove area historic district. Regional and park studies, consultations, project surveys and monitoring also contribute to our growing understanding of the history of the park and region. However, dense forest regrowth and forest debris limit ground visibility and intensive resurvey is infeasible until more vegetation management is completed.

Some of the potential impacts to cultural features by vegetation management activities are obvious, ranging from outright destruction by heavy equipment use, to disturbing the location of artifacts through soil disturbance, and thus disrupting its provenance. Other impacts are less clear, such as the possible impact of heating and exposure to smoke from a fire.

All management actions will be planned and executed in such a way as to cause the smallest possible impact on cultural sites. Prior to any vegetation management activity, the project manager will work with a State Parks cultural resource specialist in locating and delineating cultural sites and determine

necessary protective measures. Where a decision has been made to exclude activity from a site, procedures for protecting the site's integrity will be determined and implemented. Equipment will be kept out of cultural sites, and foot traffic through cultural sites will be kept to a minimum. The project manager will provide adequate briefing and supervision of personnel to ensure that cultural site disturbance and collection of artifacts does not occur. If fires are to be set, the project manager will check to see that the fire lines have been prepared according to specifications, and all firing crews must be informed of the exact locations of all sites to be protected from fire. After management activities are completed, anything that might delineate the site as a protected area (hand lines, flagging, etc…), will be removed.

Cultural and heritage resource protection recommendations also include: manual thinning and directional felling away from cultural resources when feasible; tree-length buffers and hazard tree removal within and near cultural resources; debris clearing on and near cultural resources before burning; pre and post-treatment cultural surveys with adequate funding and lead time; temporary closures and patrols, as needed, to avoid looting and vandalism; and prompt accidental-discovery notification of the District Cultural Resources specialist and the Native American Heritage Commission via the DPR chain of command.

4. Public Recreation

Restoration efforts in a state park cannot be effectively carried out without the potential for disrupting public enjoyment of the park's resources, and may even create conditions hazardous to the health and safety of visitors. The temporary closure of public use areas should be considered if the impact to visitors cannot be mitigated for. To the extent possible, prescribed burns should be planned to minimize such impacts, especially to campers who may be exposed to downslope smoke drainage at night. Interpretation methods (postings on community bulletin boards, signage within the park, kiosk handouts and docent talks) will be used to educate visitors on the type of and reason for the impacts that may affect their recreation while visiting CBTSP. If an area is deemed necessary for closure, a superintendent's order will be posted to ensure the Park's ability to manage the closure.

5. Plant Species of Special Concern

A few special interest plant species and unique communities require special treatment in the park. Prior to burning and other management actions, additional surveys will be made in each project area to identify any of these species or communities. Project Requirements will include:

- For riparian plant communities, adherence to accepted standards for management of riparian zones which require full consideration of wildlife habitat and aesthetic and recreational values before burning and other management actions. Western azalea, (*Rhododendron occidentalis*) is an important component of some of these riparian areas, and is of special interest to many park visitors.
- For Stebbin's desert parsley (*Lomatium stebbinsii*), consideration of plants and the lava cap habitat will be given prior to treatments. This may involve construction of 24-inch hand lines or wet lines around individuals before burning the area.
- For giant sequoia, while managing to "keep them in as nearly a natural condition as possible" (DPR 1989), make available the "historic and cultural features related to the first discovery of the Sierra Redwoods" (DPR 1989). This would involve protecting from prescribed burn treatments such landmark trees as the Palace Hotel or the Agassiz Tree.
- For black oaks: during thinning treatments, creating openings around large oaks that are prolific seed producers will favor regeneration. However, thinning around oaks with cavities will reduce

wildlife habitat quality and is a difficult decision. Thinning should be balanced to allow for both regeneration and wildlife habitat (North et al., 2009).

- For Pacific yew, which is at the southern limit of its distribution in the Sierra Nevada and does not grow in any other giant sequoia groves, protection from prescribed fire, mechanical thinning, and other treatments is pending determination of the factors that promote its reproduction and growth.
- For the North Grove Meadow (which is a 'wetland of the United States' defined by the federal Clean Water Act and is under the jurisdictional authority of the U.S. Army Corps of Engineers), conduct no activities which will encourage invasion of woody plants, or herbaceous exotic plants.
- For old growth sugar and ponderosa pines, or other tree species chosen to be protected, care should be taken to prevent the exposure of tree bases and fine rootlets that have grown up into a thick accumulation of duff to prolonged exposure to heat. Experience has shown that these trees are especially vulnerable to damage, and mortality, when decades long buildup of duff and litter around their trunks is allowed to smolder for several hours. This allows heat to penetrate through the relatively thin bark, resulting in damage to the underlying cambium layer. Efforts should be made to reduce this duff layer and to clear out any existing fire scars in advance of burning.

6. Soils and Slope

In some cases, erosion could be considered natural, such as soil creep and runoff from steep slopes. However, past land practices have accelerated erosion in many areas. These include road, trail, and parking lot construction and use, and most of the historical activities listed in the parks General Plan Section III.B., History of Resource Use.

The landform and edaphic factors of each project will be described in the Project Plan, and erosion will be discussed in the treatment constraints. Project requirements and BMP measures could include re-grading with out-sloping and restoring fire lines. Monitoring may measure erosion rates in the burn site.

7. Geologically Sensitive Areas

Two landslide areas along the Parkway have been identified, and will be considered for all applicable projects. The geologic features of each project will be described in the Project Burn Plan, and treatment constraints will be discussed for any geologically sensitive areas.

THIS PAGE INTENTIONALLY LEFT BLANK

VI. DEVELOPED AREA VEGETATION MANAGEMENT PLAN

Developed areas of CBTSP are those areas of intended visitor congregation plus a buffer zone of width equal to the height of the mature trees (S. Bakken, CSP Forester, per com). Approximately 110 acres (44.5 ha) of the park are developed (Figures 3a and 3b), mostly as campgrounds, day use facilities, and administrative areas. Excluded from this classification are trails and roads (both paved and unpaved), which are considered as either corridors through otherwise undeveloped land or included in developed zones.

Developed areas are meant to introduce the visitors to the ecological community of the Park and as such developed areas will retain as much of the surrounding natural character as possible. However, due to specific challenges and limitations, developed areas require more detailed management plans. Challenges include the protection of visitors, resource protection from visitor impact, and enhancement of the overall visitor experience. Limitations include the inability to use prescribed fire or managed wildfire to restore the ecological processes that created the ecosystem.

When managing the vegetative community, specifically forest structure and composition, the guidelines set for wildland areas (section V) should be followed. However, only manual thinning (V.C.1. b&c) and mechanical thinning (V.C.1.d) methods can be considered. A greater emphasis on non-native species management (V.C.2) should be placed on developed areas as visitors are a vector for invasions. Visitor safety and resource protection will be maintained and methods to achieve this will consist of the following:

A. Hazard Tree Program

Most of the developed areas are surrounded by late seral stage forest communities and as such could be at risk from falling trees. The hazard tree program manages these areas by removing any tree that poses a threat to visitors or structures. Healthy vigorous trees are not removed, but diseased, dying or dead trees (snags) that could reach a developed area if they fell on their own accord are removed. White fir within developed areas need to be monitored for the root disease, *Heterobasidion annosum.* Individual trees showing evidence of the disease will be removed as the infected trees are more susceptible to windthrow. The stumps will be flush cut or grinded and covered with soil to prevent spread of the disease (USDA Forest Service, 2010).

Outside of this tree length buffer zone, the developed area effectively ends, and dead or dying trees will not be felled under the hazard tree program.

B. Protection from Disturbance

Developed areas receive the brunt of visitor use and in many areas soil compaction can have an impact on tree growth. Soil compaction can lead to loss of porosity and anaerobic conditions thus inhibiting root growth and health and increasing erosion. Larger roots that have been exposed can be wounded and become infected by fungi or pathogens. Trees in developed areas including, iconic old growth giant sequoia and pines, can be protected by retaining forest litter and ground fuels. By retaining this natural ground cover, compaction from visitor use can be minimized. Trampling from visitor use will cause the forest litter to break down and disperse, preventing a dense buildup of duff from accumulating as it has throughout much of the forest in the absence of fire. Therefore, retaining ground cover in developed areas does not increase the fire hazard. In campgrounds and picnic areas, only a 2 foot radius around fire rings and picnic tables will be cleared of forest litter for fire protection. In high impact areas and/or areas that receive little accumulation of forest litter, the redistribution of litter from

the surrounding forest should be considered. Also, in very high use areas interpretive signage and fencing can be used to educate visitors and protect valuable resources.

Graffiti on tree and logs should be removed as soon as possible. Painted graffiti can be scraped off. Carved graffiti can be removed using a blow torch, hand or power tools to replace carved graffiti with an aesthetic that at least appears natural.

C. Visual and Acoustic Screening

In campgrounds and picnic areas the quality of the visitor experience should be managed by visual and acoustic screening from roads, structures, and neighboring campsites. Barriers of natural vegetation are maintained or encouraged in target locations to increase camper privacy and maintain the feel of the natural forest environment. In developed areas of CBTSP, a vegetative screen can be maintained through the strategic use of shade tolerant seedlings and saplings. The overstory forest should be maintained at less than 90% canopy cover to ensure robust foliar growth in these seedlings and saplings. Periodically each tree in the screen should be evaluated for its effectiveness as a visual screen. When more than 50% of the foliage of the sapling exceeds 10 feet height above ground, their function as a barrier is lost. At this stage there are two treatment choices. The tree can be retained because it is a superior candidate to fill a gap in the forest overstory. Or, if the tree is not desired for canopy replacement, it should be removed because the foliage is shading and therefore retarding the foliage of the shorter sapling/seedling neighbors. The increased solar radiation will allow for robust growth of shrubs and saplings creating or maintaining the natural barrier between campsites.

In areas where the opposite is desired, for instance reduced ground vegetation around structures for fire protection, keeping the shade trees standing will be of benefit.

VII. BEETLE OUTBREAKS

In North America insect outbreaks are increasing in size and severity (Allen et al, 2010) and within the last two decades, massive outbreaks involving native bark beetles in conifers were in an order of magnitude larger than any previously recorded (Raffa et al, 2008). Multiple factors including, drought, fire suppression, and climate change, have converged to amplify these outbreaks that have affected tens of millions of hectares in western North America since 1990 (Raffa et al, 2008). These outbreaks have triggered management responses that have resulted in additional impacts along with massive expense (Nelson et al, 2006). Predictions are that outbreaks of bark beetles will become more frequent and severe in the future (Evagelista et al, 2011) and Park managers should be prepared for such disturbances affecting CBTSP.

A. Outbreak Management

Outbreaks of bark beetles are not new. They have been occurring for millennia and have played a major role in shaping coniferous forest ecosystems of the world (Six et al, 2014). In fact, beetle outbreaks are a natural ecological process integral to the maintenance and resilience of the forest (Six et al, 2014). Adaptation involves genetic change driven by natural selection and beetle attacks may act as a natural selection process, shifting genetic structures in stands over time to those most suited to prevailing climatic conditions (Knapp, Soule, and Maxwell, 2012). However, beetle outbreaks cause widespread mortality and suppression is often perceived as something that must be conducted at all costs. As has been well demonstrated by a century of fire suppression, the cessation of natural disturbance can alter the forest in undesirable ways. Although beetle outbreaks, like fire, can have negative impacts, their natural role in many forest ecosystems is seldom considered and, as with fire, suppression of beetles over the long term may alter forests in ways that are not sustainable (Six et al, 2014).

Direct suppression of beetle outbreaks has been found to be ineffective. Even with massive efforts costing millions of dollars, suppression using direct controls has never been achieved, with at best, the rate of mortality to trees was reduced only marginally (Carroll, Shore, and Safranyik, 2006). Since beetle outbreaks are in general a natural ecological process, and outbreak suppression is generally not feasible, direct suppression methods may be not be employed at CBTSP. However, indirect methods that result in forest heterogeneity, such as prescribed burns and treatments discussed in this plan (focused on restoring a mosaic structure of forest stands of different age classes) can reduce outbreak severity and extent by decreasing the amount of contiguous susceptible hosts (Safranyik and Carroll, 2007). Just as it is hoped that implementation of this VMP will reduce the risk of catastrophic stand replacing wildfires for CBTSP, it is also hoped that by following the same directives, the risk of catastrophic beetle outbreaks will also be reduced.

Currently, the State of California is in its fifth year of drought and Governor Brown issued Executive Order 10-30-2015, better known as the Tree Mortality State of Emergency (SOE). The SOE addresses the excessive amounts of dead and dying trees found throughout California. In particular interest is the Sierra Nevada where thousands of trees have died as a result of drought related stressed trees resulting in beetles outbreaks (ips sp. and bark beetle sp.) To date it is estimated that over 29 million trees have died across the region with numbers rising exponentially. The current state is not considered a natural beetle outbreak event therefore extra measures may be required to protect the health of the forest throughout CBTSP. These measures may lead to park managers considering mechanical thinning in large bug kill areas especially if dead and dying trees will impact park infrastructure, local infrastructure, and park visitors. This may also lead to the purchasing of equipment that will provide the means to reduce dead fuel loads that could lead to extreme crown fire.

B. Stand Mortality and Fire

Beetle caused tree mortality can alter forest fuels and therefore wildfire characteristics (Hicke et al, 2012). These alterations could have multiple critical effects including, increased extreme crown fire behavior and increased surface fire intensity and rate of spread due to more downed woody debris. Despite these potential influences, there is a lack of consensus in published literature about wildfire responses in beetle killed stands. Furthermore, beetle caused mortality within attacked stands is highly variable and may lead to differences in fuels and fire behavior within locations (Turner et al., 1999).

It is understood that the effect beetle killed trees have on forest fire behavior is time dependent. In recently killed trees, reduced foliar moisture could lead to increased torching and thus crown fire potential with no expected change in surface fires. As decay progresses, needles and branches drop from the dead trees and eventually the snags themselves fall. In this later phase, increased ground fuels will increase surface fire potential while the reduced canopy bulk density will lead to lower canopy burn severity. The state of decay may not be uniform though, as beetle outbreaks can affect stands over several years, so a gradient of mortality may be present (Hicke et al, 2012).

Several studies reported that factors such as past disturbances, stand structure, topography, and vegetation type were more important than beetle outbreaks for influencing fuels characteristics, crown fire behavior (Ager et al., 2007), severity (Bigler et al., 2007, Bond et al., 2009), frequency, and extent (Kulakowski and Jarvis, 2011). However, the compounding effects of beetle killed trees with the above variables can become significant. Results from observational studies suggest that fires do not necessarily occur following beetle attack (West, 2010). Nonetheless, beetle outbreaks and wildfire are both influenced by climate, and warming projections imply these forest disturbances will increase in the coming decades (Bentz et al., 2010).

C. Stand Mortality Management

Dying, dead and down trees are critically important products of healthy forest ecosystems. They provide wildlife habitat, serve as nursery sites for germination, and provide a nutrient base that will be cycled through the ecosystem. Natural old growth forests contain high volumes of dead wood (Hunter, 1999). However as discussed above, high levels of dead trees following beetle outbreaks are a significant fuel source in fire prone systems including CBTSP. Management of post beetle outbreak stands with high mortality should attempt to balance the ecosystem needs with fire management goals. Potential actions include:

- Focus initial efforts on areas of the affected stand with higher risk and/or consequences of crown fire (i.e. developed areas and borders of the Park by neighborhoods).
- Create canopy gaps within the dead stands to reduce crown fire spread potential.
- Retain the largest and highest quality snags for habitat including, broken topped, malformed, or containing cavities.
- Retain snags in various states of decay to provide for the widest range of habitat protection.
- As stands age and ground fuel loads increase, consider reducing ladder fuels to limit ground fire potential from entering the canopy.
- In the event of complete mortality of a tree species, consider replanting from the closest seed source within the Park or from seed bank storage.
- Address increased fuel loads from tree mortality where the potential for catastrophic fire has been elevated.

VIII. COMMUNITY RELATIONS and PUBLIC EDUCATION

Ever since CSP began its prescribed burn program at CBTSP, resource managers had recognized the need to offer the public explanations regarding the value of the program, and the important role it was playing in restoring park ecosystems. At various times, meetings and seminars were held, campfire programs were conducted, interpretive panels were prepared, and brochures were published. These various efforts paid dividends in the form of general acceptance of the need for fire, and even, at times, a willingness to accept the smoky conditions that occasionally resulted.

As resource managers expand their efforts at forest restoration into thinning operations, and as the possible use of mechanized equipment is considered, a renewed effort at keeping the public informed will be made. The involvement of resource managers in various interpretive and educational efforts is an essential part of their work, and should continue into the future.

THIS PAGE INTENTIONALLY LEFT BLANK

X. UNSCHEDULED DISTURBANCES

Any significant disturbance that occurs in CBTSP is likely to have an impact on the management objectives and/or schedule of tasks. As mentioned earlier in this plan, the forests of CBTSP have evolved with regularly occurring lightning caused wildfires. More recently human caused wildfires have grown to record breaking catastrophes in both size and severity. If and when a wildfire occurs at CBTSP, the management actions will be re-evaluated before any planned activity will be carried out. For instance, if a fire burns in low severity with only patches of mid to high severity, then the event can be seen as the return of fire as ecological process. The affected stands may only require maintenance in the form of a prescribed burn (within what is believed to be the natural fire return interval, 12-17 years (McKelvey et al. 1996)). If however, a wildfire is a high severity crown fire event, then immediate restoration efforts such as soil stabilization and replanting with native stock may be required.

Other natural disturbances that could affect CBTSP include, but are not limited to, flooding, landslides, exotic pest invasion and severe wind events. Regardless of the disturbance type, any subsequent planned activity will be evaluated by the following:

- Has the disturbance occurred in the same location as the scheduled activity?
- Has the disturbance occurred in the vegetation type (but not in the same location) that has a scheduled activity?
- Has the disturbance voided or changed the priority of the scheduled activity?
- Has the disturbance created an urgent priority that usurps all scheduled activities?

THIS PAGE INTENTIONALLY LEFT BLANK

XI. REVIEW AND APPROVAL

Long term vegetation management plans do not have a termination date and consequently they must be periodically thoroughly reviewed. Furthermore, as new science emerges, resource staff must adaptively manage to incorporate new relevant scientific information. Approval and changes to this plan must be reviewed and approved by a Departmental staff with a Registered Professional Forester's License and additional environmental review may be required. All plans must be approved by the District Superintendent.

THIS PAGE INTENTIONALLY LEFT BLANK

XII. MONITORING

A. General Monitoring

General monitoring of management units (Figure 9) should be completed every two years. These management unit inspections will document forest succession conditions and the presence or spread of invasive plants. Developed areas will be surveyed for hazard trees every 2 years.

B. Project Monitoring

1. Pre-Project Sensitive Species Surveys

Project specific monitoring will include pre-project protocol surveys for northern goshawk, California spotted owls (USDI Fish and Wildlife Service, 2012 and Woodbridge and Hargis, 2006), and Townsends Big eared bat. If projects are to impact meadow or riparian areas, then surveys for great grey owls, willow flycatcher, and amphibian species including the Sierra Nevada yellow-legged frog will also be conducted. If funding and schedule allows, then surveys for forest carnivores should also be conducted specifically for American martin and fisher, the latter of which has been locally extirpated and is currently petitioned to be listed under the Endangered Species Act.

2. Photo Points

Photo points will be established and pictures taken before, during and after the completion of projects. Pictures should continue to be taken yearly or as determined by the project leader for several years after completion to document and monitor forest succession.

3. Post-Project Surveys

In addition to photo point monitoring and forest succession observations, post-project surveys will monitor for invasive species. Areas burned and worked through manual and mechanical methods will be susceptible to invasive species establishment. Known nest locations of sensitive species should also be monitored to quantify any impact (if any) the project may have caused. If funding exits, sensitive species surveys should continue in an effort to document if the project achieved any long term measurable benefits for the biotic communities. For prescribed burn treatments, erosion rate will also be monitored.

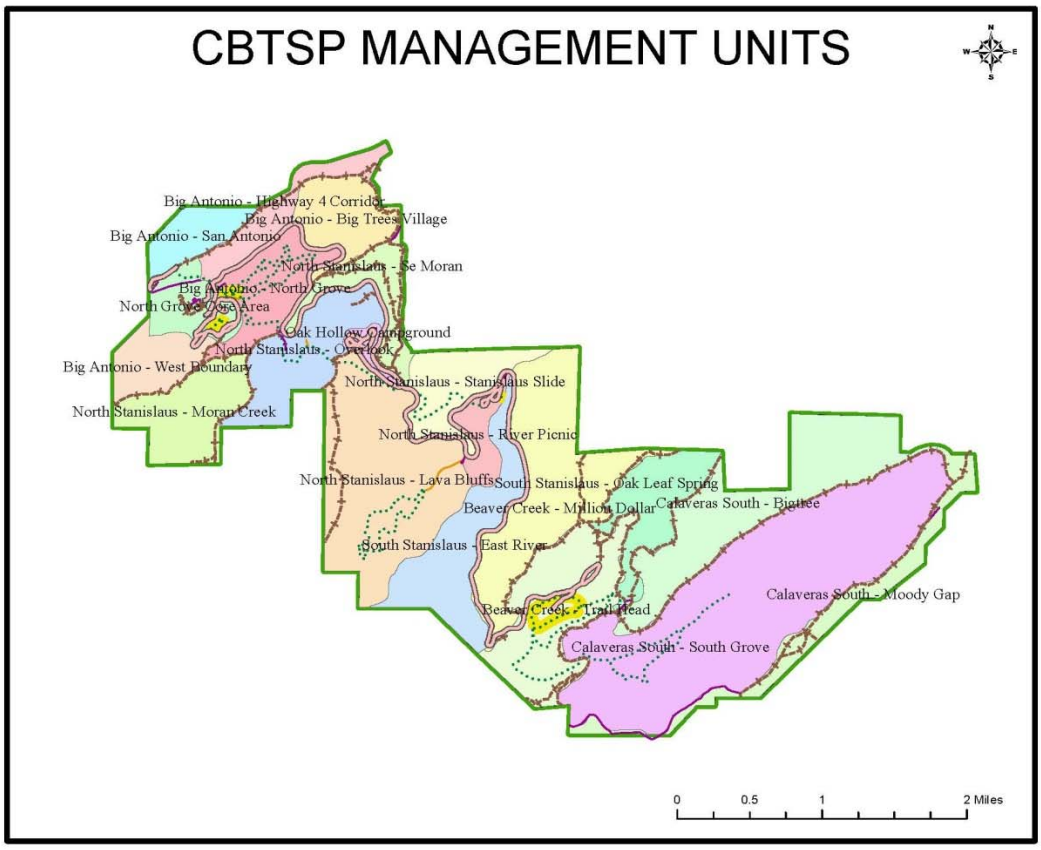


Figure 10-CBTSP Management Units.

XIII. CEQA REVIEW INTRODUCTION

A. Introduction and Regulatory Guidance

The Initial Study/Negative Declaration (IS/MND) has been prepared by the California Department of Parks and Recreation (DPR) to evaluate the potential environmental effects of the Vegetation Management Plan at Calaveras Big Trees State Park, Calaveras County, California. This document has been prepared in accordance with the California Environmental Quality Act (CEQA), Public Resources Code §21000 *et seq*., and the State CEQA Guidelines, California Code of Regulations (CCR) §15000 *et seq*.

As the CEQA lead agency for the proposed project, CSP has prepared this IS/ND to determine whether the proposed project may have a significant impact on the environment. In accordance with Sections 15063 and 15074 of the State CEQA Guidelines, an environmental impact report must be prepared if there is substantial evidence supporting a fair argument that the proposed project under review may have a potentially significant impact on the environment.

A negative declaration (ND) or MND is a written statement prepared by the lead agency describing the reasons why the proposed project would not have a significant impact on the environment, and therefore, would not require preparation of an environmental impact report (State CEQA Guidelines Section 15371). According to Section 15070 of the State CEQA Guidelines, an ND or MND for a project subject to CEQA should be prepared when either:

- The IS shows that there is no substantial evidence, in light of the whole record before the lead agency, that the project may have a significant impact on the environment; or
- The IS identifies potentially significant impacts, but:
    - Revisions in the project plans or proposals before the proposed IS/MND is released for public review would avoid the impacts or mitigate the impacts to a point where clearly no significant impacts would occur; and
    - There is no substantial evidence, in light of the whole record before the agency, that the proposed project as revised may have a significant impact on the environment.

This IS/ND conforms to the content requirements under CEQA Guidelines §15071.

B. Lead Agency

The lead agency is the public agency with primary approval authority over the proposed project. In accordance with CEQA Guidelines §15051(b)(1), "the lead agency will normally be an agency with general governmental powers, such as a city or county, rather than an agency with a single or limited purpose." CSP is the lead agency for the proposed project. The contact person for the lead agency regarding specific project information is:

Heather M. Reith
Senior Environmental Scientist (Supervisor)
Central Valley District
22708 Broadway Street
Columbia, CA 95310
Office: (209) 536-2887

Questions or comments regarding this Initial Study/Mitigated Negative Declaration should be submitted to:

Brad Michalk
California State Parks
Northern Service Center
One Capitol Mall, Ste. 410
Email: CEQANSC@parks.ca.gov
Fax: 916-445-8883

Submissions must be in writing and postmarked or received by fax or email no later than March 29, 2018. The originals of any faxed document must be received by regular mail within ten working days following the deadline for comments, along with proof of successful fax transmission. Email or fax submissions must include full name and address. All comments will be included in the final environmental document for this project and become part of the public record.

C. Summary of Findings

Chapter XIV of this document contains the Environmental (Initial Study) Checklist that identifies the potential environmental impacts (by environmental issue) and a brief discussion of each impact resulting from implementation of the proposed project.

Based on the IS and supporting environmental analysis provided in this document, the proposed Public Park Improvements Project would result in less than significant impacts for the following issues: aesthetics, agricultural resources, air quality, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation/traffic, and utilities and service systems.

In accordance with §15064(f) of the CEQA Guidelines, a MND shall be prepared if the proposed project will not have a significant effect on the environment after the inclusion of mitigation measures in the project. Based on the available project information and the environmental analysis presented in this document, there is no substantial evidence that, after the incorporation of mitigation measures, the proposed project would have a significant effect on the environment.

XIV. CEQA PROJECT DESCRIPTION

A. Introduction

DPR has prepared this IS/ND to evaluate the potential environmental effects of the proposed VMP Project at CBTSP, located in Calaveras and Tuolumne Counties, California. The proposed project would implement a management plan for management of vegetation within the park unit.

B. CEQA Project Description

The Vegetation Management Plan addresses the vegetative resources at CBTSP. It consists of a menu of actions that will be available at CBTSP to restore the ecological processes that naturally manage the Park's vegetative communities and maintain the ecological balance. Actions that are covered include:

- **Wildland Area Management Plan**
  - Succession Management
    - Prescribed Fire - Prescribed fire is the preferred method for the maintenance of ecologically sound forests at CBTSP, based on the historic fire regime. Some portions of a burn unit should be allowed to burn with higher intensities than would be desirable for most of the unit, and undesirable around the unit's perimeter. Varied intensities results in a more varied forest structure, creating a mosaic pattern of different age classes, species diversity, and stand densities.
    - Prescribed fire with pre-treatment thinning - This method will be used when existing fuel loads will not allow for a safe and controllable prescribed burn. This would include conditions with ladder fuels and forest litter in such quantity that would allow severe burn intensity to destroy root structure and allow flames to reach the canopies of old growth pines and giant sequoia. In these conditions, some manual thinning will be completed prior to the burn, to assure old growth specimens will not be destroyed. The main difference between this method, and that of manual thinning with pile burning, is that the cut slash will be burned during the prescribed burn.
    - Pile burning with pre-treatment thinning - Manual thinning consists of crews removing select vegetation as necessary to achieve desired numbers and/or species diversity. Chain saws and other hand tools would be used and the dried fuels burned on site.
    - Manual thinning with biomass removal from site - Whenever possible, slash will be burned on site, preferably in piles or stacked in long rows that emulated the effect of a tree trunk burning on the ground. Where burning is not possible, slash will be chipped and removed with piles stored in the maintenance yard until dried. The chips will be removed and used as ground cover in areas of heavy public use.

        - Mechanical thinning and removal of large trees - If many trees need to be removed then mechanical thinning will be considered. Mechanical operations will be used to achieve desired stand density where the biomass is too high to apply broadcast burning or can be effectively dealt with through manual treatment.
        - Girdling – Tree girdling could be used if snag creation is desired. Girdling will be employed in wildland areas only, so the resulting snag will not pose a threat to visitors or Park facilities.
    - Non-Native Species Management
        - Manual removal – entails hand pulling and/or use of hand tools to remove patches of invasive plants as soon as possible after they are discovered are the preferred treatment methods. The plants will be bagged and disposed.
        - Prescribed fire - Prescribed fire may be used for invasive species control if it simultaneously achieves forest treatment project goals.
        - Mechanical removal – The use of heavy equipment to remove invasive species will only occur if an infestation becomes too large to control with manual treatment, such as in developed areas where the influx of visitors is the vector of invasive species introduction and spread.
    - Seed Collection and Propagation
        - Sugar Pine - CBTSP has identified over thirty rust resistant trees within the park, and has engaged in a program of collecting cones, and hence seeds from these trees. No effort at collection is made if the cone crop in a particular year is too low to warrant the expense. The collection of cones from resistant trees will be performed solely by non-invasive climbing (without the use of spikes). The use of firearms to shoot cones out of trees will not be allowed. Protective metal bands may be placed around resistant trees to reduce predation by squirrels be painted to reduce their visibility. Trees in low use areas will be allowed to be pre-rigged to install climbing lines.
        - Giant Sequoia and Ponderosa Pine - Natural conifer regeneration after a stand replacement event will be severely limited due to the lack of a seed source. A method to hasten forest recovery would be planting conifers from native stock. However, CBTSP does not currently have a collection of seeds from giant sequoia or ponderosa pines and funding is not currently available for collecting viable seeds from giant sequoia and ponderosa pine specimens from the North Grove, South Grove, and BTNF. Giant sequoia cones can be collected from the ground. Ponderosa pine cones will be collected in the same method as for the sugar pines, by non-invasive climbing techniques.

- **Developed Area Vegetation Management Plan**

    - Hazard Tree Program - Most of the developed areas are surrounded by late seral stage forest communities and as such could be at risk from falling trees. The hazard tree program manages these areas by removing any tree that poses a

threat to visitors or structures. The only trees that would be removed are diseased, dying or dead trees (snags) that could reach a developed area if they fell on their own accord. Individual white fir trees showing evidence of the disease will be removed, the stumps flush cut or grinded and covered with soil to prevent spread of disease.

- Protection from Disturbance - Trees in developed areas including, iconic old growth giant sequoia and pines, will be protected by retaining forest litter and ground fuels to minimize compaction from visitor use. Painted graffiti on tree and logs will be scraped off as soon as possible. Carved graffiti will be removed using a blow torch, hand or power tools to replace carved graffiti with an aesthetic that at least appears natural.
- Visual and Acoustic Screening - Barriers of natural vegetation will be maintained or encouraged in target locations to increase camper privacy and maintain the feel of the natural forest environment. In developed areas of CBTSP, a vegetative screen can be maintained through the strategic use of shade tolerant seedlings and saplings. Trees may be retained to fill a gap in the forest overstory where desired or could be removed to provide sunlight to the shorter sapling/seedling neighbors, allowing for robust growth of shrubs and saplings creating or maintaining a natural barrier between campsites.

- **Beetle Outbreaks**
  - Outbreak Management - Beetle outbreaks are a natural ecological process integral to the maintenance and resilience of the forest. Although beetle outbreaks can have negative impacts, suppression over the long term may alter forests in ways that are not sustainable. Since beetle outbreaks are in general a natural ecological process, and outbreak suppression is generally not feasible, direct suppression methods may be not be employed at CBTSP. However, indirect methods that result in forest heterogeneity, such as prescribed burns and other treatments (focused on restoring a mosaic structure of forest stands of different age classes) can reduce outbreak severity and extent by decreasing the amount of contiguous susceptible hosts.
  - Stand Mortality Management - Management of post beetle outbreak stands with high mortality should attempt to balance the ecosystem needs with fire management goals. Potential actions include:
    - Focus initial efforts on areas of the affected stand with higher risk and/or consequences of crown fire (i.e. developed areas and borders of the Park by neighborhoods).
    - Create canopy gaps within the dead stands to reduce crown fire spread potential.
    - Retain the largest and highest quality snags for habitat including, broken topped, malformed, or containing cavities.
    - Retain snags in various states of decay to provide for the widest range of habitat protection.
    - As stands age and ground fuel loads increase, consider reducing ladder fuels to limit ground fire potential from entering the canopy.
    - In the event of complete mortality of a tree species, consider replanting from the closest seed source within the Park or from seed bank storage.

- Address increased fuel loads from tree mortality where the potential for catastrophic fire has been elevated.

The General Plan for CBTSP discourages the use of herbicides in the Park and as such, this VMP does not cover its utilization. While its use is not expressly prohibited in the Park, it would require separate environmental review under CEQA.

C. Project Implementation

For the covered actions, the project manager would develop a project description describing the breadth of the work proposed to be performed and resources staff would evaluate the action. The environmental coordinator would identify appropriate project requirements discussed in Section XIII.D below and incorporate into the project. These would be considered subsequent actions that are within the scope of the analysis in this Negative Declaration and no additional CEQA document would be required.

While the Vegetation Management Plan does not exclude the use of herbicide use, it would necessitate a separate CEQA review process. (Please refer to V.-C. and V.C.2.d.) For these and any other actions that are not expressly covered by the VMP, DPR will further evaluate and independently assess potential impacts for any actions proposed beyond these actions covered above, of those measures and prepare any appropriate subsequent environmental documents if such projects do not fit under the tiered approach.

This project will be a management tool that DPR will use to address needs that arise to control fuel loads, manage non-native vegetation, propagate desired species, remove hazards trees and address bark beetle issues, while minimizing impacts to the natural and cultural resources.

D. Project Requirements

Under CEQA, the Department of Parks and Recreation has the distinction of being considered both a Lead Agency and a Trustee Agency. A Lead Agency is a public agency that has the primary responsibility for carrying out or approving a project and for implementing CEQA. A Trustee Agency is a state agency having jurisdiction by law over natural resources affected by a project that are held in trust for the people of the State of California. With this distinction comes the responsibility to ensure that its actions protect both cultural and natural resources. Therefore, DPR maintains a list of Project Requirements that are included in project design to reduce impacts to resources.

DPR has developed a list of Standard Project Requirements that are actions that have been standardized statewide for the use of avoiding significant project-related impacts to the environment. From this list, standard project requirements are assigned, as appropriate to all projects. For example, projects that include ground-disturbing activities, such as trenching; would always include standard project requirements addressing the inadvertent discovery of archaeological artifacts. However, for a project that replaces a roof on an historic structure, ground disturbance would not be necessary; therefore standard project requirements for ground disturbance would not be applicable and would not be assigned to the project.

DPR also makes use of specific project requirements, developed to address project impacts for projects that have unique issues; they would not typically be standardized for projects statewide.

Finally, the plan includes Best Management Practices (BMPs) intended to lead to on-the-ground site-specific prescriptions to minimize impacts from projects. These BMPs are described in both the Vegetation Management Plan above and a vegetation management project undertaken pursuant to the plan will incorporate specific BMPs.

Table 1: Project Requirements	
Element/Title	**Requirement**
Air Quality	
SPR AIR 1	**Adherence to fuel moisture requirements**:
	Prescribed burns and biomass burning shall be performed only when the fuel moisture stick readings are at the low end of typical prescriptions, 8 to 9 percent.
SPR AIR 2	**Burn size Limitations**
	Large burn units shall be divided into small sub-plots that can be burned in a single day. As conditions allow, these larger units should be treated in a series of single-day projects.
SPR AIR 3	**Weather data and fire weather forecasts**
	Burn boss shall monitor weather data and forecasts and shall perform prescribed burns based on reports from burn bosses regarding the actual weather readings taken each day, and comparing these data with predicted values.
SPR AIR 4	**Patrol during the burn to evaluate smoke dispersal**
	A smoke monitor shall monitor smoke dispersal from prescribed burns, and shall notify the burn boss, who will take actions as defined in the smoke management plan.
SPR AIR 5	**Burning minimal amounts of green material**
	Burning of green material should be minimized to the extent possible.
SPR AIR 6	**Sensitive areas**
	Burning shall be conducted when weather forecasts predict that transport wind will carry smoke away from smoke sensitive areas.
SPR AIR 7	**Burn Termination**
	Burns shall be terminated if smoke behavior is undesirable and other measures are unsuccessful in reducing smoke.

Biological Resources	
PSR BIO 1	**Special Status Plants**
	Surveys for special status plant species with a potential to occur in the VMP project area of impact will be conducted during the appropriate blooming periods or when identity can be confirmed. All occurrences of special status plant species within the project areas will be recorded on project maps, flagged or otherwise identified on the ground. Where possible, occurrences of all special status plants will be avoided and protected from vegetation management activities. Those locations where special status plants cannot be avoided will be subject to the following conditions: Stebbins' Lomatium ▪ Prior to prescribed burning plants identified from a pre-activity survey will be protected by construction of 24-inch hand lines or wet lines around individuals before burning the area. All Other Special Status Plants **Perennial species** ▪ Prior to project activities plants will be carefully excavated and transplanted nearby in suitable habitat. All transplant work will be conducted under the direction of a DPR Environmental Scientist or DPR-approved biologist. ▪ Transplanting will occur during the dormant growing season (i.e. late fall) when the plants are least disturbed and when they can be watered by winter precipitation. **Annual species** ▪ Seeds from annual special status plant species will be collected during the appropriate season and properly stored prior to ground disturbing activities. Seeds will be sown during the appropriate season in suitable locations identified by a DPR Environmental Scientist.

PSR BIO 2	Locally Significant Plant Species of Special Concern
	California black oak During thinning treatment activities, create openings around those large oaks identified by a DPR Environmental Scientist or DPR-approved biologist as prolific seed producers. This will favor regeneration. Thinning around oaks with cavities should be balanced to allow for both regeneration and wildlife habitat, as described by North et al. (2009). Giant sequoia Management of giant sequoia will follow general guidelines described in the CBTSP General Plan, which will "keep them in as nearly a natural condition as possible" and make available the "historic and cultural features related to the first discovery of the Sierra Redwoods" (DPR 1989). This will require protecting from prescribed burn treatments such landmark trees as the Palace Hotel and the Agassiz Tree. Pacific yew Measures will be taken to protect Pacific yew from prescribed fire, mechanical thinning, and other treatment activities consistent with factors that promote its reproduction and growth. Ponderosa pine and sugar pine Measures will be taken to prevent the exposure of old growth tree bases and fine rootlets, which have grown up into a thick accumulation of duff, to prolonged exposure to heat. These trees are especially vulnerable to damage and mortality, when decades long buildup of duff and litter around their trunks is allowed to smolder for several hours. In advance of burning the duff layer will be reduced and existing fire scars will be cleared of flammable material. Western azalea Western azalea will be treated in accordance with accepted standards for management of riparian zones, which incorporate wildlife habitat and aesthetic and recreational values into plans for prescribed burning and other vegetation management activities.

PSR BIO 3	**Sierra Nevada Yellow-Legged Frog**
	Prior to the start of a VMP proposed activity or project, a DPR Environmental Scientist or DPR-approved biologist will survey within the area of impact for habitat capable of supporting Sierra Nevada yellow-legged frog (SNYLF). If suitable habitat is located within or adjacent to the project area and the DPR Environmental Scientist or DPR-approved biologist determines that potential impacts to SNYLF are possible or likely then the Department will request technical assistance from the USFWS. If the USFWS determines that take is possible then the following measures will be implemented: Projects with impacts and that ***have a federal nexus*** (either federal funding and/or requirement of a federal regulatory permit such as a U.S. Army Corps of Engineers 404 permit): ▪ The lead federal permitting or funding agency will be required to consult with the U.S. Fish and Wildlife Service (USFWS) as specified under Section 7 of the federal Endangered Species Act (ESA). Authorization for proceeding with the project or activity would then be subject to conditions identified in a Biological Opinion prepared by the USFWS. ▪ Concurrent with the federal Section 7 consultation, a DPR-qualified biologist will initiate consultation with CDFW in order to obtain a Section 2081 Incidental Take Permit for SNYLF. ▪ A DPR-qualified biologist will be on-site or on-call during all activities that could result in the take of listed species. The qualifications of the biologist(s) will be presented to the USFWS for review and approval at least 60 calendar days prior to any proposed project activities. The biologist will have oversight over implementation of all the measures described in the Terms and Conditions of the USFWS Biological Opinion issued for this project, and he/she will have the authority to stop project activities, through communication with the Project Manager, if any of the requirements associated with these measures are not being fulfilled. ▪ Prior to initiation of any on-site preparation/construction activities, the Service-approved biologist will conduct an education and training session for all available individuals who will be involved in the site preparation or project activity, including the project representative(s) responsible for reporting take to the Service and the CDFW. Training sessions will be required for all new or additional personnel before they are allowed to access the project site. Attendance sheets identifying attendees and the contractor/company they represent will be provided to the Service with the post-construction compliance report. At a minimum, the training will include a description of the SNYLF habitat. Additional information will include the general measures, as they relate to the project, that are being implemented to conserve this

	species; the penalties for non-compliance with these measures; and the boundaries (work area) within which the project must be accomplished. ▪ The limits of the project activities will be identified on maps and delineated on the ground, where feasible, and all activity will be confined within the marked area or project site. At no time will equipment or personnel be allowed to adversely affect habitat areas outside the project site without authorization from the DPR Environmental Scientist or DPR-approved biologist. ▪ To the extent possible, nighttime and rainy-season project activities must be minimized. ▪ Permanent and temporary disturbances to SNYLF habitat will be minimized to the maximum extent practicable. ▪ Project employees will exercise caution when working within SNYLF habitat. ▪ To prevent harassment, injury or mortality of SNYLF, no pets of any kind will be permitted on construction sites. ▪ If a SNYLF is found, start of work at that project location will be delayed until the species moves out of the site on its own accord, or is relocated by a USFWS-approved biologist. ▪ SNYLF will only be removed by individuals that have a special permit issued by the USFWS allowing them to handle listed species. ▪ All equipment will be maintained in accordance with the manufacturer's directions so there will be no leaks of fluids such as gasoline, oils, or solvents. Projects with impacts and ***no federal nexus***: ▪ DPR will implement mutually agreed upon SNYLF protection measures resulting from informal negotiations with the USFWS.
PSR BIO 4	**Nesting Migratory Birds and Raptors**
	▪ If possible, all noise-generating VMP activities will not occur during the raptor and migratory bird breeding season (March 1 – August 31). ▪ If VMP activities must be scheduled during the breeding season, then focused surveys for nesting migratory bird and raptor species will be conducted by a DPR-approved biologist before construction activities occur in these months to identify active nests. ▪ Surveys for active raptor nests (excluding northern goshawk and California spotted owl) will be conducted within and a 500-foot radius for all other raptor species no more than 7 days prior to the beginning of activities at each work site. If nesting raptors are found, no VMP activities will occur within a 250-foot radius of the nest tree between February 1 and August 31, or until the young have fledged and the young will no longer be impacted by project activities (as determined by a

	DPR Environmental Scientist or DPR-approved biologist) and there is no evidence of a second attempt at nesting. ▪ For northern goshawk and California spotted owl, two-year protocol level surveys are required. For California spotted owl, survey protocols recognized by the California Department of Fish and Wildlife are found in "Protocol for Surveying Proposed Management Activities that May Impact Northern Spotted Owls, revised 2012" (USFWS 2012). If occupied nests are located then no VMP activities will occur within a ½-mile radius of the nest tree between February 1 and August 31. ▪ Surveys for active migratory bird nests will be conducted within a 150-foot radius of the project area no more than 7 days prior to the beginning of activities at each work site. If active nests are located, then no VMP will occur within a 150-foot radius of the nest tree or shrub between February 1 and August 31 until the young have fledged and the young will no longer be impacted by project activities (as determined by a DPR Environmental Scientist or DPR-approved biologist).
PSR BIO 5	**Sensitive Bat Species**
	▪ If possible, all projects or vegetation management activities will occur outside of the bat maternity season (normally February 1 – September 30) ▪ No tree removal will occur between February 1 and September 30 to avoid the bat maternity season. ▪ If other work activities need to be conducted during the bat maternity season then a bat specialist will make a determination whether a bat maternity colony survey is required for the proposed project or management activity. If a survey is required and maternity colonies are located in or adjacent to the work area, then the bat specialist will determine appropriate buffers to protect breeding bats. DPR will consult and work closely with the California Department of Fish and Wildlife on all bat measures and follow their guidance.
Cultural Resources	
PSR CULT 1	**Review by Historian**
	To ensure the protection of historic resources from implementation of the VMP, the various treatment locations and the distinct vegetation management action(s) will be considered an individual project and as such, each location/action will require review by a DPR historian.
PSR CULT 2	**Historic Site Protection**
	All historic sites associated with the built environment in the project area will be protected according to project protective measures developed by the DPR historian. To identify the types, numbers, and significance of the historic resources in each VMP treatment area, and to develop appropriate protective measures (specific to historic resource(s), VMP planned activity, and location), prior to

	implementation of vegetation management activities, a DPR historian will review proposed vegetation management activities and determine if the activities will require a survey of the proposed treatment area(s). The DPR historian will survey those areas of potential direct impacts as determined in the review of the proposed activities.
PSR CULT 3	**Consultation with Historian**
	Prior to implementation of the various VMP activities, a DPR historian will consult with the project manager to identify all resources that must be protected and how they will be protected (fencing, flag and avoid, clearing, wrapping, etc.) in the area identified for treatment.
PSR CULT 4	**Historian Post Treatment Inventory**
	Following the completion of a VMP action, a DPR historian will complete post treatment inventory to identify historic resources exposed during the work and to assess the condition of that resource. The DPR archaeologist will use DPR 523 forms to update the records for previously recorded resources (if needed) and to document those newly discovered.
PSR CULT 5	**Review by Archeologist**
	To ensure the protection of archaeological sites, features, and objects from implementation of the VMP park wide, each treatment location and associated vegetation management action(s) will be considered an individual project and as such, each location/action(s) will require review by a DPR archaeologist.
PSR CULT 6	**Archeological Resources Protection**
	All archaeological resources within the identified Area of Potential Effect (APE) will be protected according to project protective measures developed by the DPR archaeologist. To identify the types, numbers, and significance of the archaeological resources in each VMP treatment area, assess impacts, and to develop appropriate protective measures (specific to archaeological resources(s), VMP planned activity, and location), the following tasks are required prior to implementation of vegetation management actions, where appropriate. ▪ Archival research relevant to the identified vegetation treatment area ▪ Native American consultation ▪ Field investigation including archaeological survey to identify documented and undocumented cultural resources in the APE. ▪ Documentation of archaeological resources (DPR 523 forms) ▪ Report of findings with GIS generated maps plotting the cultural resources. ▪ Develop resource protective measures to insure impacts will be maintained at a less than significant level**.**

PSR CULT 7	**Archeologist Consultation**
	Prior to implementation of the various VMP activities, a DPR archaeologist will consult with the project manager to identify all resources that must be protected and how they will be protected (fencing, flag and avoid, clearing, wrapping, etc.) in the area identified for treatment.
PSR CULT 8	**Archeologist Post Treatment Inventory**
	Following the completion of a VMP action, a DPR archaeologist will complete post treatment inventory to identify historic resources exposed during the work and to assess the condition of that resource. The DPR archaeologist will use DPR 523 forms to update the records for previously recorded resources (if needed) and to document those newly discovered.
PSR CULT 9	**Inadvertent Discoveries**
	If anyone discovers previously undocumented cultural resources during project construction or ground disturbing activities, work within 50 to 100 feet of the fine will be temporarily halted. The CSP State Park Representative will be notified immediately, and work will remain halted until a qualified Cultural Resource Specialist or archaeologist evaluates the significance of the find and determines and implements the appropriate treatment and disposition in accordance with the Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation. If ground-disturbing activities uncover cultural artifacts or features (including but not limited to dark soil containing shellfish, bone, flaked stone, groundstone, or deposits of historic ash), when a qualified Cultural Resource Specialist in not onsite, [insert who] will be contact the CSP Representative immediately and [insert who] will temporarily halt or divert work within the immediate vicinity of the find until a qualified Cultural Resource Specialist or archaeologist evaluates the find determines and implements the appropriate treatment and disposition of the find.
SPR CULT 10	**Discovery of Human Remains**
	In the event that human remains were discovered, work would cease immediately in the area of the find and the project manager/site supervisor would notify the appropriate DPR personnel. Any human remains and/or funerary objects would be left in place or returned to the point of discovery and covered with soil. The DPR Sector Superintendent (or authorized representative) would notify the County Coroner, in accordance with §7050.5 of the California Health and Safety Code, and the Native American Heritage Commission (or Tribal Representative). If a Native American monitor is on-site at the time of the discovery, the monitor would be responsible for notifying the appropriate Native American authorities.

	The local County Coroner should make the determination of whether the human bone is of Native American origin. In many of California's historic townsites and rural communities discoveries have been made of non-Native American human bone including non-Anglo. If the coroner or tribal representative determines the remains represent Native American interment, the NAHC in Sacramento and/or tribe would be consulted to identify the most likely descendants and appropriate disposition of the remains. Work would not resume in the area of the find until proper disposition is complete (PRC §5097.98). No human remains or funerary objects would be cleaned, photographed, analyzed, or removed from the site prior to determination If it is determined the find indicates a sacred or religious site, the site would be avoided to the maximum extent practicable. Formal consultation with the State Historic Preservation Office and review by the Native American Heritage Commission/Tribal Cultural representatives would also occur as necessary to define additional site mitigation or future restrictions.
Geology and Soils	
PSR GEO 1	**Soil Disturbance and Burn Unit Size**
	In order to prevent unnecessary soil disturbance, burn units smaller than 10 acres (4 ha) should either be a segment of a series of contiguous units to be treated as a whole, or as a training burn.
Hazards and Hazardous Materials	
SPR HAZ 1	**Hazardous Materials**
	All refueling/servicing of equipment, solid waste disposal and worksite sanitation stations should occur in designated staging areas and away from flowing water.
SPR HAZ 2	**Fire Prevention**
	▪ Obtain a burn permit from CAL FIRE. ▪ Plan burning to take into account weather, time of year, and fuel conditions so that these help achieve the desired results and minimize effects on water quality. Evaluate ground conditions to control the pattern and timing of the burn. ▪ Execute the prescribed burn with a qualified crew and burn boss. ▪ Maintain firefighting equipment available for use. ▪ Time prescribed fires so that the moisture level of the forest floor prevents the entire humus layer from being burned
Hydrology and Water Quality	
PSR HYDRO 1	**Erosion Control and Pollution Prevention**
	Burn boss shall implement a Storm Water Soil Loss Prevention Plan that includes monitoring the weather forecast, conducting site inspections before, during, and after storm events.

	CSP will cease vegetation management activities if measurable rain event with 20% or greater probability is predicted within 24 hours. This probability is expected to be the threshold for creating runoff at the burn site, and will be determined by monitoring the National Weather Service's forecast for the project area. CSP defines "measurable rain" as any rainfall that can be detected. Protective measure to prevent water-quality alterations resulting from soil erosion and sedimentation will be implemented and maintained. Burn boss shall perform daily inspections of sediment-control devices during storm events. Burn operations, such as stockpiling of materials, storage of portable equipment, vehicles, and supplies shall be restricted to the designated staging areas. If no staging area is defined, then all staging areas will be limited to the hardened surfaces of roads, parking areas unless reviewed and approved by the DPR Archeologist, and Environmental Scientist assigned to the project. All operations shall be confined to the minimal area necessary. Ground disturbance in the floodplain shall be limited to the minimum necessary to achieve the project goal. Prior to the start of any ground-disturbing activities, the burn boss shall prepare and submit a Storm Water Pollution Prevention Plan (SWPPP) for DPR approval that identifies temporary Best Management Practices (BMPs) and permanent (e.g., preserving or planting of vegetation) for use in all burn areas to reduce or eliminate the discharge of soil, surface water runoff, and pollutants during all excavation, grading, trenching, repaving, or other ground-disturbing activities. The SWPPP will include BMPs for hazardous waste and contaminated soils management and a Spill Prevention and Control Plan (SPCP), as appropriate.
PSR HYDRO 2	**Erosion and Sediment Control and Pollution Prevention**
	▪ Plan the activity as necessary through project design, location, and timing to reduce potential water quality impacts. ▪ Avoid or minimize unacceptable impacts to riparian vegetation, groundwater recharge areas, steep slopes, highly erodible soils, or unstable areas by maintaining sufficient ground cover to encourage infiltration when possible and to filter pollutants. ▪ Prescribed fire containment lines shall be located and constructed to minimize erosion and prevent runoff from directly entering water bodies through construction and maintenance of suitable drainages features like water bars. ▪ Existing firebreaks (e.g. rock outcrops and roads) will be used instead of ground-disturbing fire containment lines to minimize the need for fire line construction in situations where artificial construction of fire lines could result in excessive erosion and sedimentation. ▪ Avoid placing fire lines through sensitive areas such as wetlands, marshes, prairies, and savannas unless absolutely necessary.

	▪ Construct fire lines to be as narrow as necessary to halt the spread of the fire and place them to avoid impacts to water resources. ▪ Minimize clearing and scraping. ▪ In order to minimize high soil burn severity, weather and variables such as topography, soils and fuels will be incorporated into prescribed fire plans. ▪ Get cover on the site as soon as possible after the fire is out to maintain erosion control measures on fire lines. ▪ Install grades, ditches, and water bars if necessary to begin rehabilitation work. ▪ Install water bars on any fire line running up and down the slope, and direct runoff onto a filter strip or side slope, not into a drainage. ▪ If a prescribed fire becomes a high severity crown fire event, then immediate restoration efforts such as soil stabilization and replanting with native stock may be required. ▪ Where possible, skid trails and temporary roads will be located on existing roads. If necessary, skid trails will not contain long, straight downhill segments, which would concentrate runoff. If a long straight downhill segment is necessary, skid trail rehabilitation measures will take place as soon as vegetation management activities are completed.

E. Public Review Process

Consistent with Section 15073 of CEQA, CSP as a Trustee Agency submits the IS/ND to the State Clearinghouse for a 30-day public review period. CSP also sends the document to all individuals who have requested a copy, local libraries, and appropriate agencies. CSP is also distributing a notice of intent (NOI) to all property owners on record identified by the Sacramento County Assessor's office as having property within 500 feet of the project boundaries. The NOI identifies where the document is available for public review and invites interested parties to provide written comments for incorporation into the final IS/ND. A copy of the NOI is included as Appendix A of this document. A final IS/ND that includes written responses to comments received on significant environmental issues will be prepared. Before CSP makes a decision on the proposed project, the final IS/ND will be provided to all parties commenting on the IS/ND.

F. California State Parks Approval Process

Formal hearings are not a requirement under CEQA pursuant to Section 15202 except where the Lead Agency determines that it would facilitate the purposes and goals of CEQA to do so. CSP's approval process following the 30-day public review period is to prepare responses to comments (if any) and the Deputy Director approves the project within their signature on the Notice of Determination.

G. Visitation to CBTSP

Visitation to CBTSP has increased consistent with State population increases. The VMP is designed to support existing maintenance and is not expected to change the nature of park visitation. It simply establishes a plan to actively and proactively ensure that the plant communities represented in CBTSP are properly managed.

H. Consistency with Local Plans and Policies

CSP prepared the VMP to be consistent with the CBTSP General Plan Resource Management Policies and serves as a bridge between the desired conditions stated as goals, guidelines and policies in the general plan and the measurable implementation actions. The VMP defines the objectives, methodologies, and/or designs on how CSP will accomplish management goals for the Park. This document focuses on specific management topics, goals, or issues applying to all vegetation management efforts within CBTSP.

I. Discretionary Approvals

DPR has approval authority for subsequent projects under the VMP within the boundaries of CBTSP. Although unlikely, the following permits and/or consultations may be required to allow implementation of components of the VMP:

- Federal and State Endangered Species Act
- California Environmental Quality Act (CEQA)
- Forest Practices Act: The Department is exempt from preparing Timber Harvest Plans {PRC § 4584(f)}. However, the Department is not exempt from Professional Foresters Law {PRC § 750-783}.
- Permits
  - Burn Permit: Issued by CAL FIRE
  - Smoke Management Permit: Issued by the Local Air Pollution Control District.
  - California Department of Fish and Wildlife Stream Alteration Permit
  - Corps of Engineers 404 Permit
  - Regional Water Quality Control Board Permit
  - National Pollutant Discharge Elimination System Permit

J. Related Projects

DPR often has other smaller maintenance programs and rehabilitation projects planned for a park unit. For the areas adjacent to the road system repairs, these include:

- Environmental Restoration Projects
- Facilities Maintenance
- ADA Improvement Access Projects
- Deferred Maintenance (facilities, roads, etc.)

THIS PAGE INTENTIONALLY LEFT BLANK

XV. ENVIRONMENTAL CHECKLIST

PROJECT INFORMATION

1.	Project Title:	Vegetation Management Plan
2.	Lead Agency Name & Address:	California Department of Parks and Recreation
3.	Contact Person & Phone Number:	Brad Michalk (916)445-8783
4.	Project Location:	Calaveras Big Trees SP
5.	Project Sponsor Name & Address:	California Department of Parks and Recreation *(District name and address)* Heather M. Reith Senior Environmental Scientist (Supervisor) Central Valley District 22708 Broadway Street Columbia, CA 95310 Office: (209) 536-2887
6.	General Plan Designation:	State Park
7.	Zoning:	Recreation

8. Description of Project: The Vegetation Management Plan addresses the management of vegetative resources at Calaveras Big Trees State Park (CBTSP). A long-term vegetation management plan helps to ensure continuity of actions toward mutually accepted management goals and objectives over time. The Sierra Nevada Conservancy an agency of the State of California provided funding for this plan.

9.	Surrounding Land Uses & Setting:	Refer to Section J, (Land Use and Planning)
10.	Approval Required from Other Public Agencies	Refer to Chapter XIII, Section I

1. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact", as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agricultural Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Geology/Soils
☐ Hazards & Hazardous Materials	☐ Hydrology/Water Quality	☐ Land Use/Planning
☐ Mineral Resources	☐ Noise	☐ Population/Housing
☐ Public Services	☐ Recreation	☐ Transportation/Traffic
☐ Utilities/Service Systems	☐ Mandatory Findings of Significance	☒ None

DETERMINATION

On the basis of this initial evaluation:

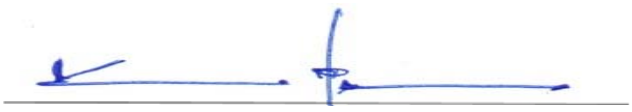
I find that the proposed project **COULD NOT** have a significant effect on the environment and a **NEGATIVE DECLARATION** will be prepared. ☐

I find that, although the original scope of the proposed project **COULD** have had a significant effect on the environment, there **WILL NOT** be a significant effect because revisions/mitigations to the project have been made by or agreed to by the applicant. A **MITIGATED NEGATIVE DECLARATION** will be prepared. ☒

I find that the proposed project **MAY** have a significant effect on the environment and an **ENVIRONMENTAL IMPACT REPORT** or its functional equivalent will be prepared. ☐

I find that the proposed project **MAY** have a "potentially significant impact" or "potentially significant unless mitigated impact" on the environment. However, at least one impact has been adequately analyzed in an earlier document, pursuant to applicable legal standards, and has been addressed by mitigation measures based on the earlier analysis, as described in the report's attachments. An **ENVIRONMENTAL IMPACT REPORT** is required, but it must analyze only the impacts not sufficiently addressed in previous documents. ☐

I find that, although the proposed project could have had a significant effect on the environment, because all potentially significant effects have been adequately analyzed in an earlier EIR or Negative Declaration, pursuant to applicable standards, and have been avoided or mitigated, pursuant to an earlier EIR, including revisions or mitigation measures that are imposed upon the proposed project, all impacts have been avoided or mitigated to a less-than-significant level and no further action is required. ☐



February 22, 2018

Brad Michalk
Environmental Coordinator

Date

ENVIRONMENTAL ISSUES

A. Aesthetics

ENVIRONMENTAL SETTING

Please refer to Chapter III., Section A through J for a comprehensive description of the setting for Calaveras Big Trees State Park (CBTSP).

CBTSP is one of the most visited units in the California State Park System. Visitors are attracted not only by the Sierra redwood groves, but also by the surrounding forests, streams and vistas. The 6,500-acre park contains two groves of Sierra redwood and countless individuals of other coniferous species native to this portion of the Sierra Nevada, most of which reach exceptional size. These trees are also notable for their coloration and effect produced by the play of light and shadows upon them at different times of day and in the various circumstances under which they grow.

CBTSP contains a wide variety of visual experiences. The deep forests, the ridge tops with their extensive views, and the river canyon all contribute to the aesthetic resources of the park. The North Grove Meadow is unique in the park, being the only formation of its kind. The aesthetics of the meadow are enhanced by its interrelationship with Big Tree Creek and the immediately adjacent North Grove of the Sierra redwoods. The meadow is scenic in all seasons, offering spring wildflowers, mist on cold fall mornings and expanses of snow in winter. The meadow-forest interface and moist conditions attract diverse wildlife and enhance the visitor experience of the North Grove Campground.

Primary access to CBTSP is via State Route 4, which bisects the far northwestern part of the Park. Caltrans has designated SR 4 as a State Scenic Highway from just east of Arnold to the Calaveras-Alpine County line.

WOULD THE PROJECT:	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

DISCUSSION

a) The trimming and thinning of a relatively small percentage of the tree population will have a less than significant impact to the scenic vistas in the park. Prescribed burns would be limited to late summer through early winter, allowing the spring growing period to cover burned landscapes with ruderal vegetation in time for the peak visitation season of mid spring through mid to late summer. Less than Significant Impact.

b) The vegetation management plan involves relatively small scale and short term changes to scenic resources in an effort to promote large scale and long-term forest health with naturally based ecosystem methodology. This proactive forest management helps prevent larger scale destruction, by wildfire, to scenic resources by removing fuel loads while promoting forest health and protecting sensitive species habitat. The removal of historic buildings is not part of this management plan. Less than Significant Impact.

c) Old growth trees will be retained, especially the giant sequoias of the North and South groves. These iconic groves are the reasons the park has been a major tourist attraction since 1852 and was declared a state park in 1931. Less than Significant Impact.

d) Lighting is not an element of this management plan and the project will introduce no new light sources into the landscape. There is the chance for temporary changes to nighttime views with the possibility of low flames visible between sundown and dawn during controlled burns. Less than Significant Impact.

B. Agricultural and Forest Resources.

ENVIRONMENTAL SETTING

This vegetation management plan includes the thinning of forest stands throughout the park to increase ecosystem health, decrease fuel loadings to reduce the risk of wildland fire, bolster forest resistance to disease and insect infestations and outbreaks as well as maintain a manageable level of risk for public health and safety.

Calaveras Big Trees State Park is zoned "Recreation" and does not support any agricultural operations or farmland. The closest land adjoining the park zoned as agricultural land or used for agricultural purposes from the project site is several miles to the west. The adjoining land to the north, south and east of the park is zoned either "Residential" or "Industrial Timber Land" (Big Tree Creek Ford Alignment and Elevation Restoration Project).

WOULD THE PROJECT*:	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in PRC section 12220(g)), timberland (as defined in PRC section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forestland or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

* In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997), prepared by the California Department of Conservation as an optional model for use in assessing impacts on agricultural and farmland.

DISCUSSION

a,e) No land adjoining the project site in any direction is zoned as agricultural land or used for agricultural purposes, as defined by the United States Department of Agriculture land inventory and monitoring criteria, as modified for California. Therefore, this project would have no effect on any category of California Farmland, conflict with any existing zoning for agricultural use or Williamson Act contract, or result in the conversion of Farmland to non-agricultural use. This project does not conflict with existing zoning for forestland, timberland or timberland zoned Timberland Production, nor will it result in the loss of forestland or conversion of forestland to non-forest use. No Impact.

C. Air Quality.

ENVIRONMENTAL SETTING

Air Quality Designations

California is divided geographically into air basins for managing the air resources of the State on a regional basis. An air basin generally has similar meteorological and geographic conditions throughout. The State is currently divided into fifteen air basins (Board, 2014). California is also divided into Air Pollution Control Districts (APCD) and Air Quality Management Districts, which are also called air districts. These agencies are county or regional governing authorities that have primary responsibility for controlling air pollution from stationary sources (Air Resources Board, n.d.). Calaveras Big Trees is located in Calaveras and Tuolumne counties, both of which are part of the Mountain Counties Air Basin. Each County however has its own APCD, Calaveras County APCD and Tuolumne County APCD.

This park-wide Vegetation Management Plan proposes to employ manual removal, prescribed fire and mechanical removal. Prescribed fire and mechanical removal have the most potential to negatively affect air quality. According to the Calaveras County APCD, "the most visible impacts to air quality within the District is (sic) a result of open burning of vegetation as conducted by individual property owners, industry, and state agencies for purposes of reducing wild land fire hazards" (Calaveras County Air Pollution Control, 2017) . Additionally, the Calaveras County APCD contends while there are minimal sources impacting air quality within their district, the County experiences air quality impacts from the Central Valley through transport pollutants (Calaveras County Air Pollution Control, 2017).

The California Air Resources Board (CARB) makes state area designations for ten criteria pollutants (an air pollutant for which acceptable levels of exposure can be determined and for which an ambient air quality standard has been set). These include ozone, suspended particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), carbon monoxide, nitrogen dioxide, sulfur dioxide, sulfates, lead, hydrogen sulfide and visibility reducing particles (VRPs) (Air Resources Board, 2016).

At the state level (in the two county project area) ozone is designated as nonattainment; $PM_{2.5}$ is designated as unclassified; PM_{10} is designated as nonattainment in Calaveras County and unclassified in Tuolumne County. Carbon monoxide is designated as attainment in Tuolumne but as unclassified in Calaveras County. Nitrogen dioxide, sulfur dioxide, sulfates and lead are designated as attainment and hydrogen sulfide and VRPs are designated as unclassified (Air Resources Board, 2016).

A pollutant is designated "attainment" if the state standard for that pollutant was not violated at any site in the area for a three-year period. If there was at least one violation of a state standard for a pollutant in the area, it is designated as "non-attainment" for that pollutant. If there are not enough data available to determine whether the standard is exceeded in an area, the area is designated as "unclassified". Non-attainment/transitional is a subcategory of the non-attainment designation; an area is designated non-attainment/transitional to signify the area is close to attaining the standard for that pollutant (Air Resources Board, 2016).

The Clean Air Act, which was last amended in 1990, requires the United States Environmental Protection Agency (USEPA) to set National Ambient Air Quality Standards (NAAQS) for widespread pollutants from numerous and diverse sources considered harmful to public health and the environment. The Clean Air Act established two types of national air quality standards. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children and the elderly. Secondary standards set limits to protect public welfare, including protection against visibility impairment,

damage to animals, crops, vegetation and buildings (United States Senate, 2004).

In contrast to the state area designations, the USEPA makes national area designations for five criteria pollutants: ozone (8-hour standard; the national 1-hour standard was revoked in June 2005), PM_{10}, carbon monoxide, nitrogen dioxide and sulfur dioxide (Air Resources Board, 2016). The USEPA has set NAAQS for six principal pollutants, which are called criteria pollutants, these are: lead, ozone, particulate matter (PM), carbon monoxide, nitrogen dioxide and sulfur dioxide, pollutants considered harmful to public health and the environment (Air Resources Board, 2016). At the national level (in the two county project area), ozone is designated nonattainment in Calaveras County and unclassified in Tuolumne County, carbon monoxide, $PM_{2.5}$, nitrogen dioxide, PM_{10} and sulfur dioxide are all designated unclassified in both counties (Air Resources Board, 2016).

If an area does not meet (or contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant, it is designated as non-attainment. If an area meets the national primary or secondary ambient air quality standard for that pollutant, it is designated as in-attainment. An area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant is designated as unclassifiable (EPA, n.d.).

Sensitive Receptors

Sensitive receptors include individuals as well as groups relating to specific land uses. Some individuals are considered to be more "sensitive" than others to air pollutants. The reasons for greater sensitivity than average include health problems, proximity to the emission source, or duration of exposure to air pollutants. Land uses such as primary and secondary schools, hospitals, and convalescent homes are considered to be sensitive receptors to poor air quality because the very young, the elderly and infirm are more susceptible to respiratory infections and other air quality related health problems than the general public. Residential uses are considered sensitive receptors because people in residential areas are often at home for extended periods of time, so they can be exposed to pollutants for extended periods. Recreational areas are considered moderately sensitive to poor air quality because vigorous exercise associated with recreation places a high demand on the human respiratory function. Sensitive receptors in the proposed project area include recreational users (trail-users, campers, etc.) and nearby residents.

WOULD THE PROJECT*:	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for	☐	☐	☒	☐

	ozone precursors)?				
d)	Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e)	Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

* Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied on to make these determinations.

DISCUSSION

a) There is no existing Air Quality Management Plan in either the Calaveras or Tuolumne County portions of the Park. As such, implementation of the proposed VMP will not obstruct implementation of any applicable air quality plans. No Impact

b) As noted in Section V.D.1 of the VMP, CSP will manage prescribed fires in such a manner (e.g. limiting size of burn, minimizing burning of green material, and termination of the burn if smoke behavior cannot be addressed) so as to minimize smoke to visitors as well as surrounding residents. Additionally, Section XIII-D requires a Smoke Management Permit from the local Air Pollution Control District. As such, implementation of VMP will not result in a violation of any air quality standard or contribute substantially to an existing or projected air quality violation.

c) Biomass burning smoke from wildfires can have a significant impact on $PM_{2.5}$ concentrations and ozone thereby affecting air quality. As noted in the environmental setting above, both Counties are designated as unclassified for $PM_{2.5}$, while both counties are classified as non-attainment for ozone. Cumulative AQ impacts could potentially result if other agencies (e.g. US Forest Service) conduct prescribed burns at the same as those within the CBTSP. However, the VMP notes that CSP must consult and coordinate timing for proposed prescribed burns with other such agencies to minimize potential cumulative effects.

Prescribed burns, when implemented under specified fuel, meteorological and dispersal conditions provides a beneficial role while minimizing smoke impacts by consuming fuels that feed wildland fires (Huey, 2017). As such, prescribed burning is an effective method to reduce fine particle emissions, and as such, implementation of the VMP with its prescribed burning component, would reduce cumulative impacts to a less than significant level.

d) Section V.D.1 of the VMP identifies the sensitive receptors near CBTSP. Most of the sensitive receptors are park facilities and park residences. It notes that prescribed fire treatments in the southern part of the park from 1975-2011 rarely resulted in unsatisfactory air quality. Downslope smoke drainage at night has occasionally resulted in smoke drifting into Forest Meadows (downslope from Arnold and between the Stanislaus River and State Route 4). Adherence to Standard Project Requirements SPR AIR 1 through AIR 7 however will ensure that impacts from smoke on sensitive receptors would remain at a less than significant level.

e) CBTSP is located approximately 3 miles east-northeast of the community of Arnold and approximately 2.5 miles from the community of Dorrington. Smoke impacts to these communities are addressed in the SMPs. Adequate smoke dispersal and smoke impacts to these communities are minimized by the adherence to the VMP, burn permit and burning only on burn days unless a variance is granted.

SPR AIR 1 – Adherence to fuel moisture requirements

Prescribed burns and biomass burning shall be performed only when the fuel moisture stick readings are at the low end of typical prescriptions, 8 to 9 percent.

SPR AIR 2 – Burn size Limitations

Large burn units shall be divided into small sub-plots that can be burned in a single day. As conditions allow, these larger units should be treated in a series of single-day projects.

SPR AIR 3 – Weather data and fire weather forecasts

Burn boss shall monitor weather data and forecasts and shall perform prescribed burns based on reports from burn bosses regarding the actual weather readings taken each day, and comparing these data with predicted values.

SPR AIR 4 – Patrol during the burn to evaluate smoke dispersal

A smoke monitor shall monitor smoke dispersal from prescribed burns, and shall notify the burn boss, who will take actions as defined in the smoke management plan.

SPR AIR 5 – Burning minimal amounts of green material

Burning of green material should be minimized to the extent possible.

SPR AIR 6 –Sensitive Areas

Burning shall be conducted when weather forecasts predict that transport wind will carry smoke away from smoke sensitive areas.

SPR AIR 7 – Termination of the burn if smoke behavior is undesirable and unable to mitigate.

Burns shall be terminated if smoke behavior is undesirable and other measures are unsuccessful in reducing smoke.

D. Biological Resources

ENVIRONMENTAL SETTING

Calaveras Big Trees State Park (CBTSP) lies within the Lower Montane Forest zone of the Sierran Floristic Province at elevations ranging from approximately 3400 feet (1035 meters) to 5560 feet (1700 meters) in elevation. The westerly flowing North Fork Stanislaus River bisects the 6497-acre park, which is roughly evenly divided between Calaveras and Tuolumne Counties.

Vegetation/Habitat

Several forest, shrub, and meadow vegetation types occur in CBTSP. These types can be categorized into alliances (equivalent to plant communities) or associations, as defined by Sawyer et al (2009) and that conform to the U.S. National Vegetation Classification Standard adopted by the federal government (USNVC 2015). The following vegetation types have been identified in CBTSP. Those marked with an asterisk are of special concern and considered to be highly imperiled by the California Department of Fish and Wildlife (CDFW 2017a).

Sequoiadendron giganteum* (Giant sequoia forest) Forest Alliance
***Quercus chrysolepis* (Canyon live oak forest) Forest Alliance**
***Quercus kelloggii* (California black oak forest) Forest Alliance**
***Pinus ponderosa* (Ponderosa pine forest) Forest Alliance**
***Pinus ponderosa – Quercus kelloggii* Association**
Pinus lambertiana* (Sugar pine forest) Forest Alliance
***Abies concolor – Pinus lambertiana* (White fir – sugar pine forest) Forest Alliance**
***Alnus* rhombifolia (White alder groves) Forest Alliance**
***Arctostaphylos patula* (Green leaf manzanita chaparral) Shrubland Alliance**
***Ceanothus cuneatus* (Wedge leaf ceanothus chaparral, Buck brush chaparral) Shrubland Alliance**
***Ceanothus cordulatus* (Mountain white thorn chaparral) Shrubland Alliance**
Wet Meadow (currently undescribed)

***Sequoiadendron giganteum* (Giant sequoia forest) Forest Alliance**

This very rare California endemic vegetation type comprises 65 groves that are restricted to the middle elevations of the Sierra Nevada Mountains. Giant sequoia (*Sequoiadendron giganteum*) dominates the canopy, with white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), and sugar pine (*Pinus lambertiana*) commonly found in the tree layer. Common constituents of the shrub and herbaceous layers include western azalea (*Rhododendron occidentale*) and bracken fern (*Pteridium aquilinum* var. *pubescens*). In more moist locations, Pacific dogwood (*Cornus nuttallii*) and California hazelnut (*Corylus cornuta* ssp. *californica*) form a portion of the tree understory.

Two giant sequoia forest groves occur in CBTSP; the North Grove situated near the parks' entrance kiosk and the much larger South Grove, which stretches for approximately one mile along Big Trees Creek.

***Pinus lambertiana* (Sugar pine forest) Forest Alliance**

Sugar pine (*Pinus lambertiana*) dominates the canopy of this vegetation type; white fir (*Abies concolor*) and incense cedar (*Calocedrus decurrens*) are common constituents of the tree layer. Common shrub species of this vegetation type include buckbrush (*Ceanothus cuneatus*), greenleaf manzanita (*Arctostaphyllus patula*), and mountain whitethorn (*Ceanothus cordulatus*). The herbaceous layer is sparse.

SPECIAL-STATUS SPECIES

Sensitive biological resources that occur or potentially occur in or near the proposed project site are discussed in this section. Special-status species (sensitive species) are defined as legally protected plants and animals or that are considered sensitive by federal, state, or local resource conservation agencies and organizations. Specifically, this includes species listed as State or federally Threatened or Endangered, those considered as candidates for listing as Threatened or Endangered, species identified by the US Fish and Wildlife Service (USFWS) and/or California Department of Fish and Wildlife (DFW) as Species of Special Concern (SSC), animals identified by CDFG as Fully Protected or Protected (FP, P), and plants considered by the California Native Plant Society (CNPS) to be rare, threatened, or endangered. Also included are habitats that considered critical for the survival of a listed species or have special value for wildlife species and plant communities that are unique or of limited distribution.

Special-status species and their habitats were evaluated for potential impacts from implementation of the Calaveras Big Trees State Park Vegetation Management Plan (VMP). Existing available data was collected and reviewed to determine the occurrence or potential occurrence of special status plants, animals, and their habitats in CBTSP. Queries of the California Department of Fish and Wildlife's California Natural Diversity Database (CDFW 2017), the USFWS (2017) Information for Planning and Conservation (IPaC), and the California Native Plant Society's On-line Inventory, Eighth Edition (CNPS 2017), were conducted for special-status species and habitats within the Dorrington, Boards Crossing, Garnet Hill, Calaveras Dome, Tamarack, Liberty Hill, Crandall Peak, Strawberry, and Stanislaus United States Geological Society (USGS) quadrangle maps.

Special-status plant and animal species are described below along with their potential to occur within CBTSP.

Plant Species

The California Natural Diversity Database (CNDDB), CNPS, and U.S. Fish and Wildlife Service (USFWS) have identified twenty-four special status species as occurring or having a potential to occur within the nine USGS quadrangle maps identified in the Special Status Species introduction. Suitable habitat may be available in the project area for fifteen of these species,

which are described below. In addition, several species of special concern identified in the VMP for special treatment are also evaluated.

Special-Status Plant Species that are included in resource database searches for the project area that are Known to Occur, or Could Potentially Occur within the Project Area

California black oak (*Quercus kelloggii*) – California black oak is a tree species native to western North America and of special importance in California partly because its acorns are important to the diets of various animals, including bears, deer, woodpeckers, and squirrels (USDA NRCS 2017). It provided food, medicine, dyes, utensils, games, toys, and construction materials for Native Americans; many tribes still gather acorns. In CBTSP, *Quercus kelloggii* (California black oak forest) Forest Alliance vegetation is not an extensive vegetation type, occurring in scattered stands.

Coleman's rein orchid (*Piperia colemanii*) – Coleman's rein orchid is a California Rare Plant Rank 4.3 perennial herb of chaparral and lower montane coniferous forest habitat (often sandy substrates) of the Sierra Nevada and Cascade Mountain Ranges. It ranges from Tulare County north to Butte County at elevations of approximately 3940 feet to 7550 feet amsl and blooms from June through August. Potentially suitable habitat for Coleman's rein orchid occurs within CBTSP.

Davy's sedge (*Carex davyi*) – Davy's sedge is a California Rare Plant Rank 1B.3 perennial herb that blooms from May through August and occurs in subalpine coniferous forest and upper montane coniferous forest habitats from Tuolumne County north to Sierra County. Found at elevations of approximately 4920 feet to 10,500 feet amsl, historic reports from the 1860's identify this species location at "Big Trees". Potentially suitable habitat for Davy's sedge occurs within CBTSP.

Fresno ceanothus (*Ceanothus fresnensis*) – Fresno ceanothus is a California Rare Plant Rank 4.3 perennial evergreen shrub that occurs in lower montane coniferous forest and openings in cismontane woodland habitat at elevations from approximately 2950 feet to 6900 feet amsl. Blooming from May through July, this California endemic is restricted to the Sierra Nevada Mountains. A 1940 occurrence of Fresno ceanothus was reported near "Big Trees" (Calflora 2017).

Giant sequoia (*Sequoiadendron giganteum*) – Giant sequoia is an extremely rare California endemic that occupies elevations from 2700 feet to as high as 8900 feet amsl on the western slopes of the Sierra Nevada Mountains from Tulare County to Placer County (Harvey et al. 1980, Stephenson 1996). This species is restricted to 75 naturally occurring groves with a disjunct distribution; most of the groves are located in the southern third of their geographical range and in or near Sequoia and Kings Canyon National Parks (Harvey et al. 1980). Past ancestors of giant sequoia were more widespread, populating Greenland, Alaska, Canada, and England during Cretaceous and Tertiary time periods. Two separate groves of giant sequoia occur In CBTSP, the North Grove near the park entrance station and the more extensive and remote South Grove.

Humboldt lily (*Lilium humboldtii* ssp. *humboldtii*) – Humboldt lily is a California Rare Plant Rank 4.2 perennial bulbiferous herb that occupies openings in chaparral, cismontane woodland, and lower montane coniferous forest habitats of the Sierra Nevada and Cascade Ranges. Ranging from Fresno County north to Tehama County, this species blooms from May through July (sometimes to August) and occurs at elevations from approximately 300 feet to 4200 feet amsl. Potentially suitable habitat for Humboldt lily occurs within CBTSP.

Mingan moonwort (*Botrychium minganense*) – Mingan moonwort is a California Rare Plant Rank 2B.2 perennial rhizomatous herb that occurs in mesic areas of bogs and fens, lower montane coniferous forest, meadows and seeps (edges), and upper montane coniferous forest habitats. This species is more common outside of California, where it ranges from San Bernardino County north to Shasta, Trinity, Lassen, and Modoc Counties. It occurs at elevations of 4770 feet to 7150 feet amsl and blooms from July through September. Potentially suitable habitat for Mingan moonwort occurs within CBTSP.

Pacific yew (*Taxus brevifolia*) – Pacific yew is a large shrub or small tree (up to 80 feet in height) distributed from northern California to Oregon, Washington, Montana, Idaho, and southeast Alaska (The Gymnosperm Database 2017a). It was widely used by Native Americans for a variety of uses, including canoe paddles, bowls, tool handles, medicine, etc. Pacific yew reaches its southern most limits in the Sierra Nevada Mountains at the North Grove and does not grow in any other giant sequoia groves.

Ponderosa pine (*Pinus ponderosa*) – Ponderosa pine is native to the western United States and Canada and is the most common pine in North America (The Gymnosperm Database 2017b). Mature trees range in height from approximately 60 feet to a maximum of 236 feet. Ponderosa pine dominated coniferous forests typically exhibit an open canopy where natural processes such as wildfire are not suppressed. Old growth ponderosa pine forests are a common vegetation type in CBTSP.

Red Hills soaproot (*Chlorogalum grandiflorum*) – Red Hills soaproot is a California Rare Plant Rank 1B.2 bulbiferous herb that blooms from May through June and occurs on serpentinite, gabbroic and other soils in chaparral, cismontane woodland, and lower montane coniferous forest habitats. This California endemic ranges from elevations of 4770 feet to 7150 feet amsl and has only been reported from Amador, Butte, Calaveras, El Dorado, Placer, and Tuolumne Counties. Potentially suitable habitat for Red Hills soaproot occurs within CBTSP.

Scalloped moonwort (*Botrychium crenulatum*) – Scalloped moonwort is a California Rare Plant Rank 2B.2 perennial rhizomatous herb that blooms from June through September and occupies bogs and fens, lower montane coniferous forest, meadows and seeps, marshes and swamps (freshwater), and upper montane coniferous forest habitats. Ranging from approximately 4160 feet to 10,760 feet amsl in elevation, this uncommon fern species is widely distributed from southern to northern California, including reported locations in Tuolumne County (Calflora 2017). Potentially suitable habitat for scalloped moonwort occurs within CBTSP.

Sierra bolandra (*Bolandra californica*) – Sierra bolandra is a California Rare Plant Rank 4.3 perennial herb of upper and lower montane coniferous forest habitat that is restricted to the Sierra Nevada Mountains at reported elevations of approximately 3200 feet to 8040 feet amsl. It blooms from June through July and ranges from Mariposa Count to El Dorado County. Potentially suitable habitat for Sierra bolandra occurs within CBTSP.

Sierra clarkia (*Clarkia virgata*) – Sierra clarkia is a California Rare Plant Rank 4.3 annual herb that occupies cismontane woodland and lower montane coniferous forest habitat in Amador, Calaveras, El Dorado, Mariposa, Plumas, and Tuolumne Counties. It blooms from May through August and occurs at elevations of approximately 1310 feet to 5300 feet amsl. In 1890, a specimen of Sierra clarkia was collected from what is now the Big Trees area of CBTSP (Calflora 2017).

Small's southern clarkia (*Clarkia australis*) – Small's southern clarkia is a California Rare Plant Rank 1B.2 annual herb that blooms from May through August and occurs at elevations of approximately 2620 feet to 6800 feet amsl. This California endemic species occupies cismontane woodland and lower montane coniferous forest habitats in Calaveras, Tuolumne, Madera, and Mariposa Counties. Potentially suitable habitat for Small's southern clarkia occurs within CBTSP.

Stebbins' lomatium (*Lomatium stebbinsii*) – Stebbins' lomatium is a California Rare Plant Rank 1B.1 perennial herb that grows on gravelly, volcanic clay substrates in chaparral and lower montane coniferous forest habitats of Calaveras and Tuolumne Counties. It blooms from March through May and ranges in elevation from approximately 4085 feet to 7800 feet amsl. Gibson (Calflora 2017) has identified a small CBTSP population of this California endemic species 1 mile east of the park entrance station at an elevation of the 4,480 feet.

Streambank spring beauty (*Claytonia parviflora* ssp. *grandiflora*) – Streambank spring beauty is a California Rare Plant Rank 4.2 annual herb that occupies rocky substrates in cismontane woodland habitat from Kern County north to Butte County. Found at elevations from approximately 820 feet to 3940 feet amsl, this California endemic species blooms from February through May. Potentially suitable habitat for Streambank spring beauty occurs within CBTSP.

Sugar pine (Pinus lambertiana) – Sugar pine is thetallest and largest pine species in the world (maximum 274 feet in height) and produces the longest cones, up to 20 inches in length (The Gymnosperm Database 2017c). It ranges from southern Oregon through the Sierra Nevada Mountains (including western Nevada) to southern California and northern Baja California. Accidentally introduced from Europe in 1909, the white pine blister rust (*Cronartium ribicola*) has killed a high proportion of sugar pines, especially in the northern end of its range. A single coniferous stand dominated by sugar pine has been mapped at CBTSP.

Three-bracted onion (*Allium tribracteatum*) – Three-bracted onion is a California Rare Plant Rank 1B.2 perennial bulbiferous herb that grows on volcanic substrates of chaparral, lower montane coniferous forest, and upper montane coniferous forest habitats of Alpine, Amador, Calaveras, El Dorado, and Tuolumne Counties. It occurs at elevations of approximately 3600

feet to 9840 feet amsl and blooms from April through August. Walfoort and Hunt (1982) report an occurrence of this California endemic species within the CBTSP.

Western azalea (*Rhododendron occidentalis*) – Western azalea is a shrub up to 16 feet in height with showy white to pink flowers. It occurs from southern California to as far north as Lincoln and Douglas Counties in Oregon (Wikipedia 2017a). The VMP identifies western azalea as an important component of park riparian areas and is of special interest to many park visitors. It inhabits mesic locations in the North Grove as well as other riparian areas of the park.

Yellow-lip pansy monkeyflower (*Diplacus pulchellus*) – Yellow-lip pansy monkeyflower is a California Rare Plant Rank 1B.2 annual herb that grows on vernally mesic, often disturbed, clay soils of meadows and seeps and lower montane coniferous forest habitats. It occurs at elevations ranging from approximately 1965 feet to 6560 feet amsl and blooms from April through July. This California endemic species only occurs in Calaveras, Tuolumne, and Mariposa Counties. Potentially suitable habitat for yellow-lip pansy monkeyflower occurs within CBTSP.

Wildlife Species

Typical mammal species in CBTSP include western gray squirrel (*Sciurus griseus*), Douglas squirrel (*Tamiasciurus douglasii*) raccoon (*Procyon lotor*), coyote (*Canis latrans*), mule deer (*Odocoileus hemionus*), and American black bear (*Ursus americanus*). Common bird species include dark-eyed junco (*Junco hyemalis*), mountain chickadee (*Poecile gambeli*), red-breasted nuthatch (*Sitta canadensis*), pygmy nuthatch (*Sitta pygmaea*), and American robin (*Turdus migratorius*). Less conspicuous avian species include pileated woodpecker (*Dryocopus pileatus*) and white-headed woodpecker (*Picoides albolarvatus*), as both are heard more often than seen.

Most aquatic species in CBTSP occur in cool swift moving mountain streams (e.g. North Fork Stanislaus River and Beaver Creek), with rainbow trout (*Oncorhynchus mykiss*) being among the most common. Introduced brown trout (*Salmo trutta*) and the native California roach (*Hesperoleucus symmetricus*) are also present. Numerous species of aquatic insects, including mayflies, stoneflies and caddisflies, occupy stream habitats in CBTSP.

The California Natural Diversity Data Base (CNDDB) has identified eighteen special status wildlife species for the nine USGS quadrangle maps identified in the Special Status Species introduction. Five of these are listed species. The United States Fish and Wildlife Service Information for Planning and Conservation (IPaC) site identifies an additional four listed species.

No species of special concern, threatened or endangered animal species are currently known to breed at CBTSP, however a few have been recorded in or from CBTSP. Only one of the eighteen species listed on the nine USGS quad search in the CNDDB was recorded as being in CBTSP; an active osprey nest was located in 2004. California Spotted Owl and Northern Goshawk nest in the area but are rarely detected in CBTSP, and neither is a listed species.

Special-Status Animal Species that are included in resource database searches for the project area and are Known to Occur, or Could Potentially Occur within the Project Area

FISH

Steelhead (*Oncorhynchus mykiss*), **California Central Valley DPS** (distinct population segment) – The NMFS listed the Central Valley (CV) steelhead ESU as Threatened. In 2006, NMFS and USFWS announced that both agencies would apply the joint NMFS Distinct Population Segment (DPS) policy 61 Federal Register (FR) 4722 (NMFS 2014) to populations of steelhead DPS. CV steelhead listing was revised in 2006 and maintained its Threatened classification. The downstream Goodwin Dam prevents steelhead from upstream migration into CBTSP.

AMPHIBIANS

California Red-legged Frog (*Rana draytonii*) – California red-legged frog is a federal Threatened and State Species of Special Concern species that breed in aquatic habitats including pools and backwaters within streams and creeks, ponds, marshes, springs, and sag ponds. Additionally, they frequently breed in artificial impoundments such as stock ponds. They depend on upland habitats with downed woody vegetation, leaf litter and small animal burrows that provide protection from predators and help prevent desiccation. Only five occurrences are listed in the CNDDB for Calaveras and Tuolumne counties combined and no occurrences are listed in the nine quad project area.

Sierra Nevada Yellow-legged Frog (*Rana sierrae*) – Sierra Nevada yellow-legged frog is a Federal Endangered and State Threatened species found in portions of the western Sierra Nevada and eastern slope of the Sierra Nevada (USFWS 2017a). They typically inhabit lakes, ponds, marshes, meadows and streams at high elevations, ranging from 4,500 to 12,000 feet, but can occur as low as about 3,500 feet in the northern portions of their range. These highly aquatic frogs are rarely found more than 3.3 feet from water. The CNDDB identifies this species from the vicinity of Dorrington and potentially suitable breeding habitat exists within CBTSP.

California Tiger Salamander (*Ambystoma californiense*) – California tiger salamander is a federal and state Threatened species that is restricted to grasslands and low foothills with pools or ponds that are necessary for breeding (USFWS 2017b). Adults spend most of their lives on land, using burrows made by squirrels and other burrowing mammals. As they mostly inhabit the Central Valley and Sierra Nevada Foothills, they are not likely to be found in project areas.

BIRDS

California spotted owl (*Strix occidentalis occidentalis*) – California spotted owl breeds and roosts in forests and woodlands containing large old trees and snags, dense canopies (≥70% canopy closure), multiple canopy layers, and downed woody debris (Zeiner et al. 1990a). In the Sierra Nevada Mountains, it predominantly utilizes Sierran mixed-conifer, white fir (*Abies*

concolor), montane hardwood-conifer, and montane hardwood forest habitats at mid-elevations. Suitable habitat for this species occurs in CBTSP.

Great Gray Owl (*Strix nebulosa*) – Great gray owl is a State Endangered species whose numbers were estimated to be as low as 300 birds in the state as of a 2015 study (Wikipedia 2017b). The first nest south of Canada was found in 1914 in Yosemite National Park. This population is genetically isolated from populations in Oregon and farther north. One of the thirty occurrences for Calaveras and Tuolumne counties identified in the CNDDB is from a project area USGS quad, on Stanislaus National Forest land, dated September 1993.

Bald Eagle (*Haliaeetus leucocephalus*) – Bald eagle is a State Endangered species that was once widespread and abundant in California but is making a comeback from near extinction following a ban on DDT in 1972 (USFWS 2017c). In 1977, nesting occurred in only eight California counties; currently bald eagles are found in 41 of the State's 58 counties. One of the seven occurrences in the CNDDB for Calaveras and Tuolumne counties is from a project area USGS quad. A nest near Beardsley Point Boat Ramp and Picnic area in the Stanislaus National Forest was documented from 2006 to 2009.

Northern goshawk *(Accipiter gentilis*) – The SSC northern goshawk is the largest of the accipter hawks and prefer old-growth conifer, mixed hardwood-conifer, birch, or aspen forests for nesting (Cornell 2016a, Squires and Reynolds 1997, Small 1994; Zeiner et al. 1990a). This species diet depends on season and region, but generally small rodents, squirrels, large songbirds, and medium-sized game birds form the bulk of their diet. The nesting period typically starts in March or early April, with only one brood produced per season. Fledging occurs approximately 36 days after hatching. Suitable breeding and foraging habitat exists in and adjacent to CBTSP; the CNDDB (CDFW 2017) documents northern goshawk nesting within a few miles of the park.

Osprey (*Pandion haliaetus*) – Osprey is a California Species of Special Concern that builds large stick nests in treetops or snags in open forests within fifteen miles of a good fish-producing body of water (CDFW 2017b). Osprey breeding in CBTSP was documented in 2004 (CDFW 2017b).

Willow flycatcher (*Empidonax traillii*) – Habitat for this State Endangered species generally consists of extensive, dense willow thickets along riparian or other wetland areas (Cornell 2016b). Insects provide most of this small bird's diet, which is supplemented by berries in the fall. A willow flycatcher was observed in CBTSP in 1988 (eBird 2017) and suitable nesting habitat occurs along several stream locations in CBTSP.

MAMMALS

Sensitive Bat Species

Potentially suitable roosting and/or breeding habitat occurs in CBTSP for several bat species. Threats to bats includes loss of roosting habitat due to pesticide application, agricultural

conversion, timber harvest, loss of riparian vegetation, recreational activities such as rock climbing, mining activities (e.g. renewed mining or mining reclamation), and demolition and/or modification of man-made structures (WBWG 2015).

The CNDDB reports occurrences of two bat species in the USGS quads queried for this environmental analysis.

Townsend's big-eared bat (*Corynorhinus townsendii*) – Townsend's big-eared bat is a State Candidate Threatened species found in a variety of habitats that range from coniferous forests and woodlands, deciduous riparian woodland, semi-desert and montane shrublands (Arroyo-Cabrales and Álvarez-Castañeda 2017). They are most common in evergreen forests in the warmer months. During the fall and winter months, they hibernate in mines or caves either individually or in groups composed of several hundred bats. In spring and summer months, they roost in limestone caves, lava tubes, basal cavities of trees, and human-made structures. The females form maternity colonies which rarely exceed 100 bats, often in dark places, and the males are solitary during the maternity period. One of the seventeen reported occurrences in the CNDDB from Calaveras and Tuolumne Counties is a 2001 report on PG&E property from a project area quad. Potentially suitable habitat for this species occurs in CBTSP.

Spotted bat (*Euderma maculatum*) – Spotted bat is the largest bat in North America, ranging up to approximately 5 inches in length. Preferred habitat includes tree cavities, the underside of bridges, and rock crevices (Zeiner et. al. 1990b). It feeds over water and along washes and moths provide most of its food. Spotted bat has no listing status, but CDFW identifies the species as vulnerable in the state due to a restricted range, relatively few populations, and recent and widespread declines, or other factors making it vulnerable to extirpation from the state. Suitable foraging and breeding habitat for this species occurs within CBTSP.

WATERS OF THE UNITED STATES

The federal Clean Water Act (CWA) is a 1977 amendment to the Federal Water Pollution Control Act of 1972, which set the basic structure for regulating discharges of pollutants to waters of the United States. The intent was to maintain the chemical, physical, and biological integrity of the nation's waters [Federal Water Pollution Control Act/Clean Water Act, 33 U.S.C. 1251, §101(a), 2002]. In addition, the CWA intended to provide a mechanism for regulating discharges of pollutants into the waters of the U.S and gave the U.S. Environmental Protection Agency (USEPA) authority to implement pollution control programs, such as setting wastewater standards for industry and water quality standards for all contaminants in surface waters.

Section 404 of the CWA establishes programs to regulate the discharge of dredged and fill material into waters of the United States, including wetlands. The term "waters of the U.S." applies to the jurisdictional limits of the authority of the US Army Corps of Engineers (USACE) to regulate navigable waters under Section 404 of the CWA. Section 502(7) of the Act defines navigable waters as "waters of the United States, including the territorial seas." By definition, navigable waters include all wetlands and tributaries to "waters of the United States."

USACE authority to regulate navigable waters is also provided under Section 10 of the federal Rivers and Harbors Act of 1899. Under this statute, the USACE regulates excavation or filling operations or the alteration or modification of the course, location, condition, or capacity of any navigable water of the United States. Waters are defined in this statute as all waters used in interstate or foreign commerce, waters subject to the ebb and flow of the tide, all interstate waters including interstate wetlands and all other waters such as intrastate lakes, rivers, streams, mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, and natural ponds.

For purposes of Section 404 of the Clean Water Act, the lateral limits of USACE-jurisdiction over non-tidal water bodies (e.g. streams) extend to the ordinary high water mark (OHWM), in the absence of wetlands (USACE 2005).

The State Water Resources Control Board regulates the alteration of any federal water body, including wetlands and streams through Section 401 of the Clean Water Act. The appropriate Regional Water Quality Control Board(s) certify that water quality of the affected water body is not subject to unacceptable environmental impacts under provisions of the 401 certification program (SWRCB 2017). This project is subject to the Central Valley Regional Water Quality Control Board regulatory authority.

Pursuant to Fish and Game Code Section 1600 et seq., the CDFW regulates any work undertaken in or near a river, stream, or lake that flows at least intermittently through a bed or channel.

The project area encompasses USACE-jurisdictional wetlands, such as the large montane North Grove Meadow, which occupies a mesic area adjacent to the North Grove Campground. Several major streams flow through CBTSP, including the North Fork Stanislaus River and Beaver Creek, all of which constitute “waters of the U.S.” and are subject to USACE and CDFW regulatory authority.

		POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
WOULD THE PROJECT:					
a)	Have a substantial adverse effect, either directly or through habitat modification, on any species identified as a sensitive, candidate, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?	☐	☐	☒	☐
b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?	☐	☐	☒	☐

c)	Have a substantial adverse effect on federally protected wetlands, as defined by §404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐
d)	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e)	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f)	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Criteria for Determining Significance

The analysis of determining the significance of impacts of the Proposed Action to Biological Resources is based on criteria **IV** a-f, described in the environmental checklist above.

DISCUSSION

This project proposes implementation of a Vegetative Management Plan (VMP) that will employ various means and methods to manage vegetative resources and restore ecological processes through various treatment methods and activities. For vegetative succession management, these methods include: 1) prescribed fire, 2) prescribed fire with pre-treatment thinning, 3) pile burning with pre-treatment thinning, 4) manual thinning with biomass removal from site, 5) mechanical thinning and removal of large trees, and 6) girdling. For non-native species management, methods include 1) manual removal, 2) prescribed fire, 3) mechanical removal, and 4) herbicide use (after careful evaluation, when other methods are not feasible or practical). Other vegetation management goals include seed collection and propagation of sugar pine, ponderosa pine, and giant sequoia.

Each proposed activity or project developed from the VMP needs to be assessed on an individual basis in order to develop the appropriate CEQA compliance determination. Measures and/or requirements to mitigate, minimize or eliminate impacts are described below.

a)(i) **Special status plant species**. As described in the Environmental Setting, suitable habitat exists within the project area for 15 special status plant species, including reported occurrences of Stebbins' lomatium. Integration of **Specific Project Requirement BIO-1: CNPS, CNDDB, and USFWS Special Status Plant Species** would reduce projects or vegetation management activities impacts to a less than significant level.

PSR BIO 1 – Special Status Plants

Surveys for special status plant species with a potential to occur in the VMP project area of impact will be conducted during the appropriate blooming periods or when identity can be confirmed. All occurrences of special status plant species within the project areas will be recorded on project maps, flagged or otherwise identified on the ground. Where possible, occurrences of all special status plants will be avoided and protected from vegetation management activities. Those locations where special status plants cannot be avoided will be subject to the following conditions:

Stebbins' Lomatium

Prior to prescribed burning plants identified from a pre-activity survey will be protected by construction of 24-inch hand lines or wet lines around individuals before burning the area.

All Other Special Status Plants

Perennial species

- **Prior to project activities plants will be carefully excavated and transplanted nearby in suitable habitat. All transplant work will be conducted under the direction of a DPR Environmental Scientist or DPR-approved biologist.**
- **Transplanting will occur during the dormant growing season (i.e. late fall) when the plants are least disturbed and when they can be watered by winter precipitation.**
- **Annual species**
- **Seeds from annual special status plant species will be collected during the appropriate season and properly stored prior to ground disturbing activities. Seeds will be sown during the appropriate season in suitable locations identified by a DPR Environmental Scientist.**

The VMP identifies six other plant species of special concern without listing status that could be impacted from project activities. These species are California black oak, giant sequoia, Pacific yew, ponderosa pine, sugar pine, and western azalea. Integration of **Specific Project Requirement BIO-2: Locally Significant Plant Species of Special Concern** would reduce projects or vegetation management activities impacts to a less than significant level.

PSR BIO 2 – Locally Significant Plant Species of Special Concern

California black oak
During thinning treatment activities, create openings around those large oaks identified by a DPR Environmental Scientist or DPR-approved biologist as prolific seed producers. This will favor regeneration. Thinning around oaks with cavities should be balanced to allow for both regeneration and wildlife habitat, as described by North et al. (2009).

Giant sequoia
Management of giant sequoia will follow general guidelines described in the CBTSP General Plan, which will "keep them in as nearly a natural condition as possible" and make available the "historic and cultural features related to the first discovery of the Sierra Redwoods" (DPR 1989). This will require protecting from prescribed burn treatments such landmark trees as the Palace Hotel and the Agassiz Tree.

Pacific yew
Measures will be taken to protect Pacific yew from prescribed fire, mechanical thinning, and other treatment activities consistent with factors that promote its reproduction and growth.

Ponderosa pine and sugar pine
Measures will be taken to prevent the exposure of old growth tree bases and fine rootlets, which have grown up into a thick accumulation of duff, to prolonged exposure to heat. These trees are especially vulnerable to damage and mortality, when decades long buildup of duff and litter around their trunks is allowed to smolder for several hours. In advance of burning the duff layer will be reduced and existing fire scars will be cleared of flammable material.

Western azalea
Western azalea will be treated in accordance with accepted standards for management of riparian zones, which incorporate wildlife habitat and aesthetic and recreational values into plans for prescribed burning and other vegetation management activities.

(ii) **Steelhead, California red-legged frog, and California tiger salamander**. As described in the Environmental Setting, Goodwin Dam, which is downstream from the project area, is a barrier to anadromous fish, including steelhead. No suitable breeding habitat for California red-legged frog (CRLF) has been identified within CBTSP or in the CNDDB for the nine USGS quads queried for the VMP is project. No suitable breeding habitat exists within the park or nearby surrounding areas for California tiger salamander.

(iii) **Sierra Nevada yellow-legged frog**. As described in the Environmental Setting, potentially suitable breeding habitat for this species occurs in CBTSP. If projects are determined to have the potential to impact riparian areas then Integration of **Specific Project Requirement BIO-3: Sierra Nevada yellow-legged frog** would reduce projects or vegetation management activities impacts to a less than significant level.

PSR BIO 3 – Sierra Nevada Yellow-Legged Frog

Prior to the start of a VMP proposed activity or project, a DPR Environmental Scientist or DPR-approved biologist will survey within the area of impact for habitat capable of supporting Sierra Nevada yellow-legged frog (SNYLF). If suitable habitat is located within or adjacent to the project area and the DPR Environmental Scientist or DPR-approved biologist determines that potential

impacts to SNYLF are possible or likely then the Department will request technical assistance from the USFWS. If the USFWS determines that take is possible then the following measures will be implemented:

Projects with impacts and that *have a federal nexus* (either federal funding and/or requirement of a federal regulatory permit such as a U.S. Army Corps of Engineers 404 permit):

- **The lead federal permitting or funding agency will be required to consult with the U.S. Fish and Wildlife Service (USFWS) as specified under Section 7 of the federal Endangered Species Act (ESA). Authorization for proceeding with the project or activity would then be subject to conditions identified in a Biological Opinion prepared by the USFWS.**
- **Concurrent with the federal Section 7 consultation, a DPR-qualified biologist will initiate consultation with CDFW in order to obtain a Section 2081 Incidental Take Permit for SNYLF.**
- **A DPR-qualified biologist will be on-site or on-call during all activities that could result in the take of listed species. The qualifications of the biologist(s) will be presented to the USFWS for review and approval at least 60 calendar days prior to any proposed project activities. The biologist will have oversight over implementation of all the measures described in the Terms and Conditions of the USFWS Biological Opinion issued for this project, and he/she will have the authority to stop project activities, through communication with the Project Manager, if any of the requirements associated with these measures are not being fulfilled.**
- **Prior to initiation of any on-site preparation/construction activities, the Service-approved biologist will conduct an education and training session for all available individuals who will be involved in the site preparation or project activity, including the project representative(s) responsible for reporting take to the Service and the CDFW. Training sessions will be required for all new or additional personnel before they are allowed to access the project site. Attendance sheets identifying attendees and the contractor/company they represent will be provided to the Service with the post-construction compliance report. At a minimum, the training will include a description of the SNYLF habitat. Additional information will include the general measures, as they relate to the project, that are being implemented to conserve this species; the penalties for non-compliance with these measures; and the boundaries (work area) within which the project must be accomplished.**
- **The limits of the project activities will be identified on maps and delineated on the ground, where feasible, and all activity will be confined within the marked area or project site. At no time will equipment or personnel be allowed to adversely affect habitat areas outside the project site without authorization from the DPR Environmental Scientist or DPR-approved biologist.**
- **To the extent possible, nighttime and rainy-season project activities must be minimized.**

- **Permanent and temporary disturbances to SNYLF habitat will be minimized to the maximum extent practicable.**
- **Project employees will exercise caution when working within SNYLF habitat.**
- **To prevent harassment, injury or mortality of SNYLF, no pets of any kind will be permitted on construction sites.**
- **If a SNYLF is found, start of work at that project location will be delayed until the species moves out of the site on its own accord, or is relocated by a USFWS-approved biologist.**
- **SNYLF will only be removed by individuals that have a special permit issued by the USFWS allowing them to handle listed species.**
- **All equipment will be maintained in accordance with the manufacturer's directions so there will be no leaks of fluids such as gasoline, oils, or solvents.**

Projects with impacts and *no federal nexus*:

DPR will implement mutually agreed upon SNYLF protection measures resulting from informal negotiations with the USFWS.

(iv) **Nesting raptors and migratory birds**. As described above in the Environmental Setting, suitable habitat occurs within CBTSP for several species of raptors and migratory birds, including bald eagle, California spotted owl, northern goshawk, and willow flycatcher. Nesting raptors and migratory birds are protected by the federal Migratory Bird Treaty Act (16 U.S.C. 703-712), and by the state Department of Fish and Wildlife Fish and Game Code (Sections §3503, §3503.5, and §3513). Under these laws, all raptors and migratory birds, and their nests, are protected.

Vegetation management projects and activities have the potential to impact special status avian species. Integration of **Standard Project Requirement Bio-4: Nesting Migratory Birds and Raptors** would reduce projects or vegetation management activities impacts to a less than significant level.

PSR BIO 4 – Nesting Migratory Birds and Raptors

- **If possible, all noise-generating VMP activities will not occur during the raptor and migratory bird breeding season (March 1 – August 31).**
- **If VMP activities must be scheduled during the breeding season, then focused surveys for nesting migratory bird and raptor species will be conducted by a DPR-approved biologist before construction activities occur in these months to identify active nests.**
- **Surveys for active raptor nests (excluding northern goshawk and California spotted owl) will be conducted within and a 500-foot radius for all other raptor species no more than 7 days prior to the beginning of activities at each work site. If nesting raptors are found, no VMP activities will occur within a 250-foot radius of the nest tree between February 1 and August 31, or until the young have fledged and the young will no longer be impacted by project activities (as**

determined by a DPR Environmental Scientist or DPR-approved biologist) and there is no evidence of a second attempt at nesting.

- **For northern goshawk and California spotted owl, two-year protocol level surveys are required. For California spotted owl, survey protocols recognized by the California Department of Fish and Wildlife are found in "Protocol for Surveying Proposed Management Activities that May Impact Northern Spotted Owls, revised 2012" (USFWS 2012). If occupied nests are located then no VMP activities will occur within a ½-mile radius of the nest tree between February 1 and August 31.**
- **Surveys for active migratory bird nests will be conducted within a 150-foot radius of the project area no more than 7 days prior to the beginning of activities at each work site. If active nests are located, then no VMP will occur within a 150-foot radius of the nest tree or shrub between February 1 and August 31 until the young have fledged and the young will no longer be impacted by project activities (as determined by a DPR Environmental Scientist or DPR-approved biologist).**

(v) **Sensitive bat species**. As described above in the Environmental Setting, potentially suitable roosting and/or breeding habitat occurs in CBTSP for several bat species, including spotted bat. Integration of **Standard Project Requirement BIO-5: Sensitive Bat Species** would reduce would reduce projects or vegetation management activities impacts to a less than significant level.

PSR BIO 5 – Sensitive Bat Species

- **If possible, all projects or vegetation management activities will occur outside of the bat maternity season (normally February 1 – September 30)**
- **No tree removal will occur between February 1 and September 30 to avoid the bat maternity season.**
- **If other work activities need to be conducted during the bat maternity season then a bat specialist will make a determination whether a bat maternity colony survey is required for the proposed project or management activity. If a survey is required and maternity colonies are located in or adjacent to the work area, then the bat specialist will determine appropriate buffers to protect breeding bats. DPR will consult and work closely with the California Department of Fish and Wildlife on all bat measures and follow their guidance.**

b) As described above in the Environmental Setting, CBTSP supports occurrences of ***Sequoiadendron giganteum* (Giant sequoia forest) Forest Alliance** and ***Pinus lambertiana* (Sugar pine forest) Forest Alliance** vegetation that are recognized by the CDFW as special status natural communities. These two communities are dominated by giant sequoia and sugar pine, respectively, and integration of **Specific Project Requirement BIO-2: Locally Significant Plant Species of Special Concern** would

reduce projects or vegetation management activities impacts to a less than significant level.

Sensitive riparian areas exist within CBTSP and projects or vegetation management activities could create impacts to these resources. Although no project or management activity is anticipated or proposed within riparian habitat, indirect effects of prescribed burning, such as ash fall or ash runoff, could affect these sensitive areas. Integration of **Project Specific Requirement HYD 1: Water Quality Impacts** and **Project Specific Requirement HYD 4: Erosion and Sediment Control and Pollution Prevention**.

A. As described in the Environmental Setting at least one USACE-jurisdictional wetland, as defined in Section 404 of the federal CWA, occurs within CBTSP. Several major streams flow through CBTSP, including the North Fork Stanislaus River and Beaver Creek, all of which constitute "waters of the U.S." and are subject regulation by the USACE, Central Valley Regional Water Quality Control Board, and CDFW under sections 404 (CWA), 401 (CWA), and 1600 (Fish and Game Code), respectively.

   In addition to Best Management Practices (BMP's) identified in the Hydrology Section all permits necessary to conduct the proposed project or VMP activity, as determined by a DPR Environmental Scientist or DPR-approved biologist, would be obtained prior to the start of any work. All permit/agreement conditions would be implemented, reducing any potential impacts to a less than significant level.

B. It is not expected that any VMP activities or projects would interfere substantially with the movement of any native resident wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. Park lands not affected by a proposed project or VMP activity and wildlands surrounding the park provide ample areas for wildlife to move unimpeded and to avoid project or VMP activities.

C. The California Department of Parks and Recreation (CDPR) is not subject to local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; however, Department policy and its Mission Statement incorporate the protection of natural resources into the short-term and long-term management goals for its park units. Furthermore, CDPR operates cooperatively with sister agencies and local jurisdictions to insure natural resources are protected in perpetuity. No impact.

f) This project does not conflict with any Habitat Conservation Plans, Natural Communities Conservation Plans, or other approved habitat conservation plan. No impact.

E. Cultural Resources.

ENVIRONMENTAL SETTING

Calaveras Big Trees State Park (CBTSP) is located on the western slope of the Sierra Nevada, in both Calaveras and Tuolumne counties. The park is generally within the zone of Mixed Conifer/Ponderosa Pine dominated plant communities and is approximately 6497 acres (2629 hectares) in size. The famous giant sequoia trees are located in two concentrations, the North and South Groves.

Elevation in Calaveras Big Trees State Park ranges between 3400 feet (1035 meters) to 5560 feet (1700 meters), concurrent with the rest of slope. Elevations are highest at the northeast and southeast corners of the park, at 5,230 and 5,560 feet (1,600 and 1,700 meters) respectively, while lowest in the central southern area, where the North Fork of the Stanislaus River leave the park. Calaveras' climate is typical of California mountain terrain, with hot dry summers and cool wet winters. Temperatures rarely reach over 100° F in summer and under 20° F in winter. Precipitation averages at about 55 inches per year, mostly between October and April.

CBTSP is located in the Sierra Nevada Geomorphic Province, and contains "metamorphic of the Paleozoic Era, Cretaceous granitics, Tertiary volcanic flows and pyroclastic rocks, and Quaternary alluvium and colluvium (DPR 1986)." The Cretaceous granite is the most prevalent rock type in the park, and extends from the western boundary to the main entrance. This granitic element is also the source of most extensive soil within the park. Volcanic soils are also present, but typically found on ridgetops, where the parent materials originally formed over granitic bedrock.

The park's flora and fauna are consistent with its mountainous, forested terrain. Reports put Calaveras' habitats as supporting 355 species of animals, including the black bear (*Ursus americanus*), mountain lion (*Puma concolor*), bobcat (*Lynx rufus*), gray fox (*Urocyon cinereoargenteus*), mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), and gray (*Sciurus griseus*) and Douglas squirrel (*Tamiasciurus douglasii*). Plant life consists of coniferous forests and the groves of giant sequoia trees (*Sequoiadendron giganteum*). Specific tree species include ponderosa pine, montane hardwood conifer and Sierran mixed conifer.

CULTURAL SETTING

Cultural resources are physical remains of past human activities. There are two main categories of cultural resources, the archaeological environment and the historic (built-environment), both influenced by the natural setting and resource availability. CBTSP embodies a rich cultural heritage with evidence suggesting occupation, at least for seasonally thousands of years and occupation by Euro-Americans virtually continuous since 1852. The Central Sierra Miwok are the Native American inhabitants who occupied the region. Historic use of the area centered on several themes: transportation, mining, logging, homesteading, grazing, and recreation. Recreation played an important role in the early development of the area, particularly around Calaveras Big Trees State Park.

Prehistoric and Ethnographic Setting

Archaeological and ethnographic data from the region indicate Native populations heavily utilized the area, this evidenced by the documentation of prehistoric sites in the park and throughout the area. The area provided access to a rich and varied ecological setting ideal for subsistence including resource procurement and processing, and other activities related seasonal rotation and occupation.

Prehistoric

Prehistoric occupation of the western Sierra Nevada foothills was as early as 12,000 years ago. Prior to 8,000 years ago, evidence for the presence of humans is sparse and scattered throughout the state. Fluted Clovis-like projectile points found in the foothills near Copperopolis relate to the Paleo-Indian Period around 12,000 years ago. Discovery of sites in the region that predate 6,000 are limited. In the foothills of Calaveras County, the excavated Skyrocket site is one of the few Lower Archaic archaeological site in the region (Rosenthal et al 2007:152).

During the Middle Archaic Period between 8,000 to 3,000 years ago, regional subsistence strategies shifted to an increased emphasis on plant resources due to climatic changes and the drying of pluvial lakes (Rosenthal et al. 2007: 152-155). In archaeological sites, dating to this period there is an abundance of milling implements that corroborates the addition of hard seeds, acorns, and pine nuts to a wide range of natural resources (game animals, wild plants, waterfowl, and fish). Sites dating to the Middle Archaic are somewhat common in the foothills and less so in the valley. The archaeological assemblages indicate that as groups became better adapted to their regional or local environments, the subsistence and settlements patterns varied somewhat among the foothills and valley floor.

During the Upper Archaic and Late Prehistoric periods after approximately 3,000 years ago, the complexity of the prehistoric archaeological record within the valley and foothills reflects increases in specialized adaptation to locally available resources such as acorns and salmon, in permanently occupied settlements, and in the expansion of regional populations and trade networks (Rosenthal et al. 2007:155-159). Large shell midden/mounds at coastal and inland sites in the Sacramento Valley and northern San Joaquin Valley attest to the regular reuse of these locales over hundreds of years or more from the Upper Archaic into the Late Prehistoric period. During the Upper Archaic, marine shell beads and obsidian continue to be the hallmark of long distance trade and exchange networks developed during the preceding period (Hughes and Milliken 2007:259-270).

Some of the hallmarks of the Late Prehistoric period are changes in technology to procure and process resources. These include an increase in the prevalence of mortars and pestles, a diversification in types of watercraft and fishhooks, and the use of the bow and arrow (Jones and Klar 2007: 305-307). This period marks the beginning of ceramic manufacture in parts of the Central Valley, in addition to the southeast desert region and southwest basin ranges of the state.

The Late Prehistoric period, displays an increase in sedentism and exchange networks, accompanied by the development of social stratification and craft specialization. This indicated by the variety of artifacts including bone tools, basketry, marine shell beads, obsidian tools, and brownware ceramics, the use of clamshell disk beads as a form of currency, architectural features such as house floors and rock-lined ovens in large mounded villages, and variation in burial types and associated grave goods (Rosenthal et al. 2007:157-159). Many of the large and small villages settled along major rivers and tributaries correlate to known ethnographic settlements.

Ethnographic

The project area falls within the ethnographic territory of the Central Sierra Miwok (also Me-Wuk or Miwuk). At the time of contact, the Central Sierra Miwok inhabited the west side of the Sierra Nevada foothills in vicinity of the project area. The Central Sierra Miwok were part of a larger linguistic group identified as the Sierra or East Miwok.

In the foothills, semi-permanent settlements or winter villages of the seasonally mobile Sierra Miwok were located along the river drainages, with the Central Sierra Miwok along the Stanislaus and Tuolumne drainages. Along the riverbanks, archaeological sites and prehistoric burials have been identified and many, at locations of ethnographic Miwok villages.

The abundant natural resources hunted, gathered, and fished by the Sierra Miwok varied seasonally (Levy 1978: 402-406). As resources became available, the Sierra Miwok dispersed to higher or lower elevations. Acorns from valley, foothill, and mountain oaks were particularly importance to the diet. The Miwok used a variety of tools, implements, and enclosures to gather plant foods, fish, hunt land mammals, and capture waterfowl and other birds. The Sierra Miwok participated in a widespread east-west trade network connected by trails between the coast and the Great Basin with salt and obsidian moving westward, marine shell and steatite moving eastward, and basketry traded in both directions (Levy 1978:411-412).

The discovery of gold in the Sierra Foothills and the ensuing Gold Rush resulted in drastic changes in population, resource access, and native lifeways for the Miwok, as thousands of prospectors traveled through the northern San Joaquin Valley and into the foothills, and hundreds more settled in the valley and began farming (Levy 1978:401).

Historic Setting

The earliest known presence of Euro-Americans in what is now known as Calaveras Big Trees State Park was possibly in 1833, when the Walker Party Crossed the Sierra Nevada. Although the route of the party remains unclear, the diary of one party member, Zenas Leonard, contains the earliest documented reference to giant sequoias. Although it may be possible that the reference was for either the Tuolumne or Merced groves north of Yosemite Valley, at least one historian thought the reference could also apply to the Calaveras North Grove (DPR 2016).

In 1841, John Bidwell apparently saw the Calaveras North Grove, as did others in that decade; however, the earliest undisputable account of the giant sequoia in the park dates from 1852 by

professional hunter August Dowd. Employed by Union Water Company to provide meat for a ditch construction crew, Dowd tracked a wounded bear into the North Grove and returned with stories of the huge trees. Dowd's discovery was initially dismissed; however, it did not take long for word of the giant trees to spread through the community, the state, and eventually the botanical world (DPR 1989).

After the discovery, what followed was a century and a half of exploitation of the Big Trees and attempts to use the sequoias in a variety of business schemes. In 1853, Captain H.W. Hanford undertook the challenge of cutting down the largest tree in the grove (the Discovery Tree), which was the first tree seen by Dowd. The job took a month to accomplish using augers to drill parallel holes through the tree. The top of the trunk accommodated a two-lane bowling alley and bar, and an octagonal building constructed atop of the 25-foot diameter stump where dances took place. Not far from the current Visitor Center, the stump of the Discovery Tree, the butt log, and a portion of the upper trunk are still in place.

Another destructive act in 1853 stripped the second largest tree (Mother of the Forest) in the grove of its bark. The bark from the tree was stripped using scaffolding up to height of 116-feet. The bark panels were carefully numbered and then shipped for reassembly and display in New York and London. Today, the dead tree still stands and holds visible scars from stripping the bark.

One of the first owners of the North Grove, William W. Lapham took immediate actions to accommodate visitors coming to view the trees, which included building a small hotel near the Big Stump. Despite visitors coming from near and far, the undertaking was not profitable and resulted in the 320-acre property changing hands four or five times before 1860. The hotel was more successful when James Sperry and John Perry, who owned and operated a hotel in Murphy's (now the Murphy's Hotel) beginning in 1856, took ownership of the hotel at Big Trees. By 1862, the two constructed a new hotel in a more desirable location. Land holdings of Sperry and Perry continued to increase, the hotel expanded to accommodate more people, and they built a caretaker's cottage. Later the cottage housed additional guests and today, the still standing building serves as a park office.

With different partners, Mr. Sperry held ownership of the Big Tree property and operated the hotel until 1900. In 1861, James M. Hutchings (of Yosemite fame) acquired a portion of the South Grove with the intention to develop a resort; however, access was a problem and he only was able to construct no more than two cabins. After Hutching's failure, James Sperry purchased the South Grove from Hutchings and his partners resulting in the consolidation of the North and South Groves. Although the ten-mile trail to the South Grove was rough, visitors at Sperry's hotel also visited the remote South Grove (DPR 1990).

In both the North and South Groves, the owners gave names to many of the big trees and attached marble name plaques. The tree names were presidents, renowned people, state names, or tree characteristics. Some of the name plaques were present on the trees at the time of park acquisition; however, State Parks removed and curated the plaques as historic artifacts.

The early history of Calaveras Big Trees reflects a mid-nineteenth century curiosity with the great natural wonders of California, and other regions of the west. A phenomena, which intensified as people moved west and settled in remote and yet to be unexplored places. Early visitors to the groves recognized the importance of these natural features, and like Sperry desired to have them preserved for enjoyment of the public. Although Sperry acknowledged the importance of the giant sequoia groves and had an interest in the property becoming a national or state park, he could not afford to donate the land for that purpose. In 1900, he sold the land to lumberman Robert P. Whiteside who wanted to continue what Sperry had established.

While Whiteside intended to keep maintaining the two groves, activism to preserve them in the public domain continued. In 1909, an act of Congress authorized the U.S. Forest Service to acquire both groves by the exchange of timber on other national forest land to compensate Whiteside. In 1928, another act of Congress authorized the transfer of intervening national forest land to the state if the State of California acquired either the North or South Grove or both; however, neither act were implemented until the 1950s.

The Whiteside family continued to operate the Big Trees Hotel until the State of California acquired the property in 1931. Subsequently, the State acquired the North Grove and surrounding area from the Whitesides with 1928 state park bond money and matching funds raised the by the Calaveras Grove Association. The state owned Big Trees Hotel operated until 1937 by a lessee. The Whitesides in 1926 sold the South Grove to the Pickering Lumber Company and in 1954; the State of California acquired the land including a portion of the Beaver Creek drainage from the Pickerings.

Park Development

While the State was able to acquire the land, beginning in 1928, they did not have the means to further develop or improve it for the public until the 1930s. In 1933 during the Great Depression, President Roosevelt created the Civilian Conservation Corps (CCC), considered the most successful depression-generated recovery agency. The goal of the CCC was to provide unskilled labor employment and job training to young men, usually through construction and infrastructure projects in forested areas.

When the CCC arrived at Calaveras Big Trees State Park on June 8, 1933, it became the first CCC camp in California. Company 590 from Kentucky established the camp with 210 workers, a group of foremen and four army officers, including Captain W. E. Remington, the company commander. Their task was to develop the campground following plans provided by the National Park Service State Parks program and approved by the California State Park Commission. Company 590 spent one season at the park before moving to Mount Diablo. Company 1921-V replaced them in April 1934 and spent two seasons at Calaveras Big Trees before other camps rotated in through 1941. The CCC companies rehabilitated the old Mammoth Grove Hotel, brought in a telephone line and built a campground and a day-use picnic area complete with tables, stoves, cupboards, combination buildings and a water system. They also established a fire break around the park, installed perimeter fencing, built a new entrance station, created a network of hiking and horse trails, built and installed log benches throughout the park installed

split rail fences around the named trees and removed an old picket and wire fence in the Sentinel Tree Meadow Area, replacing it with a new split log fence. Near the western end of the meadow, they developed a winter sports area with a toboggan run, a downhill slope and a warming shelter. In the North Grove, they shaved off the damaged surface of the Big Stump, planning and smoothing it to an even surface, constructed new access stairs to it and cleaned the whole area around it. Other new construction included building the maintenance area and residences on the north side of Highway 4, a bunkhouse, a dispensary and in 1937; they built "Big Trees Lodge (now Jack Knight Hall). Much of the work completed by the CCC remains in the park today including Big Trees Lodge, the bunkhouse, a maintenance office, an auto shop (formally the CCC office), and the CCC dispensary that is now a State Parks on-site residence. The work by the CCC in Calaveras Big Trees State Park and the imprint it left is of great historic significance (Engbeck 2002).

Cultural Resources

The Vegetation Management Plan (VMP) covers the whole park, and because of this, the project area is essentially the park itself. Potential impacts to cultural resources from implementation of the VMG potentially include all archaeological sites and historic resources within the park, documented or undocumented.

Cultural resources documented in the park consist of both archaeological resources and the historic built environment. Native American archaeological resources recorded in the park consist of both habitation and task specific sites. Historic archaeological sites include the remnants of buildings (former hotel and cabin sites), transportation corridors/routes (bridges, roads, logging railroad grades, and a stagecoach stop), water conveyance systems (tunnels and ditches), and historic dumpsites. Some of the historic resources that comprise the built environment (building, structure, feature, object) in the park include the 1865 Perry Cottage (Park Headquarters Building), the CCC Recreation Building (Big Trees Lodge or Jack Knight Hall), historic land survey corners (from 1871), and elements that comprise the North Grove Campground (VMP 2016)

Undoubtedly, the most significant historic feature in CBTSP is the Big Stump, together with the adjacent butt-log, both the remains of what was the largest tree in the Grove, and the giant sequoias first seen by August Dowd in 1852. In addition to the Big Stump, the giant sequoias as described in 1924 Oscar M. Evans survey including 41 named trees and noteworthy fallen, are of historic significance.

Historic Resources

As discussed above, there are historic buildings and landscape features throughout the park. In the North Grove (including the park entrance, administration area, day-use and campground) there are thirteen buildings that are over 50 years old that date from 1856 (the caretaker's cottage currently used as an office) through 1963. These buildings also include the CCC constructed infirmary and Jack Knight Hall among others. Landscape and natural features include the Big Stump, campground and day use sites, a vehicle bridge, masonry stairs and various named trees, also mentioned above. The Maintenance Yard, located across Highway 4

approximately seven buildings or structures and two features (ramps) that were built by the CCCs and three buildings that were built in the 1950s. The Residence Area, also located across the road, includes four residential buildings and two garages that date to the 1950s and Oak Hollow Campground has two buildings constructed in 1963. In addition to the built environment, there are CCC trails throughout the park such as the interpretive trail in the North Grove. Also, based on the extensive period of time the CCC groups worked in the park, there is a strong possibility that there are other unknown landscape features they constructed in more remote locations (DPR 1989; Roland 2003).

Archaeological Resources

The first systematic and unit-wide cultural resource inventories in CBTSP began in the early 1980s (DPR 1989) in response to anticipated prescribed burn activities and for preparation of the general plan. During these surveys, State Park archaeologist focused on key areas of CBTSP and resulted in documentation of close to 50 sites, and covered approximately 70 percent of the park. Since the 1980s, numerous small-scale cultural resource investigations have occurred in CBTSP, and typically associated with park projects including major and minor capital outlay, routine park maintenance and deferred maintenance, accessibility, and special archaeological studies. Despite the large number of documented site records for the park, there are very few associated archaeological survey reports.

A record search of those retained and managed by the department and with the Central California Information Center in 2017, indicate 50 documented archaeological resources in the park. Archaeological resources include 33 prehistoric, 12 historic, and 5 multicomponent sites. The prehistoric sites consist primarily of bedrock milling features, with fewer numbers of lithic scatters or bedrock milling features with lithic deposits. The historic sites include the remains of historic structures, transportation features, water conveyance and storage systems, and trash dumps. In 2007, in support of an accessibility improvements project in the North Grove, one newly discovered prehistoric site (lithic scatter) was documented (Gruver 2006). This brings the number of known prehistoric sites in the park up to 34 for a total of sites 51 known sites. It is probable that subsequent surveys will reveal more prehistoric and historic archaeological resources, especially since some areas of the park have not received systematic archaeological surveys.

	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
WOULD THE PROJECT:				
a) Cause a substantial adverse change in the significance of a historical resource, as defined in §15064.5?	☐	☐	☒	☐
b) Cause a substantial adverse change in the significance of an archaeological resource, pursuant	☐	☐	☒	☐

	to §15064.5?				
c)	Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐
d)	Would the project cause a substantial Adverse change in the significance of a Tribal Cultural Resource as defined in §21074?	☐	☐	☐	☐

DISCUSSION

The Calaveras Big Trees Vegetation Management Plan defines the need for active and proactive engagement in ensuring proper management of the plant communities with the best practices available through a range of acceptable management activities. The overarching goal of the Vegetation Management Plan (VMP) is functional restoration - restoring the ecological process that naturally manage the park's vegetative communities (DPR 2016). Because the forest structure and composition vary with topography and aspect, distinct management actions (treatment plans) at various locations throughout the park are necessary to effectively implement the VMP.

Calaveras Big Trees State Park supports a diverse assemblage of historic and archaeological resources that date back hundreds of years. Archival research in support of this project indicates the most comprehensive cultural resource inventories in the park are over 40 years old and some locations in the park have never received survey coverage.

Historic Resources at CBTSP include buildings and features related to the initial development of the area as a tourist attraction. The majority of the historic features are associated with the CCC occupation and campground development activities that spanned from the early 1930s through the early 1940s. Additionally, the park displays a continuation of these development activities associated with recreation that occurred from the 1950s through the early 1960s. Based on this extended historic development of the area as a tourist destination, a period spanning over 100 years, there is a high probability that there are other historic landscape features within the various vegetation treatment areas.

Archaeological resources at CBTSP include sites, features, and objects associated with prehistoric, ethnographic, and historic utilization of the area. It is likely that many more archaeological resources are present in the park, covered by the forest duff and understory, or in yet to be inventoried locations.

Activities related to the VMP for CBTSP have the potential to affect significant historic and archaeological resources (documented and undocumented) either directly or indirectly. If not mindfully managed with proper cultural review, various vegetation management activities may result in irreparable damage to these cultural resources. The Project Requirements identified below will insure that potential impacts to the cultural resources remain at a less than significant level.

a) Potential impacts to the historic resources (documented and undocumented) by vegetation management activities are obvious, and range from outright destruction by heavy equipment use, the unintentional burning of buildings or features, the damage to named trees and the various landscape features surrounding them or the unintentional damage to historic roads and trails used for clearing, hauling or staging for brush removal. Other impacts are less clear such as the possible effects from heating and smoke exposure from burning or the unintentional alterations to historic view sheds through the removal of vegetation.

Potential adverse effects produced by each activity in the various locations throughout the park requires assessment on a case-by-case basis (treatment type and location) in order to develop the appropriate CEQA compliance determination. Implementation of Specific Project Requirements **CULT 1- 3** and Standard Project Requirements **CULT 9** described below would reduce potential adverse impacts to historic resources to a less-than-significant level.

PSR CULT 1 – Review by Historian

To ensure the protection of historic resources from implementation of the VMP, the various treatment locations and the distinct vegetation management action(s) will be considered an individual project and as such, each location/action will require review by a DPR historian.

PSR CULT 2 – Historic Site Protection

All historic sites associated with the built environment in the project area will be protected according to project protective measures developed by the DPR historian. To identify the types, numbers, and significance of the historic resources in each VMP treatment area, and to develop appropriate protective measures (specific to historic resource(s), VMP planned activity, and location), prior to implementation of vegetation management activities, a DPR historian will review proposed vegetation management activities and determine if the activities will require a survey of the proposed treatment area(s). The DPR historian will survey those areas of potential direct impacts as determined in the review of the proposed activities.

PSR CULT 3 – Consultation with Historian

Prior to implementation of the various VMP activities, a DPR historian will consult with the project manager to identify all resources that must be protected and how they will be protected (fencing, flag and avoid, clearing, wrapping, etc.) in the area identified for treatment.

PSR CULT 9 – Inadvertent Discoveries

If anyone discovers previously undocumented cultural resources during project construction or ground disturbing activities, work within 50 to 100 feet of the fine will be temporarily halted. The CSP State Park Representative will be notified immediately, and work will remain halted until a qualified Cultural Resource Specialist or archaeologist evaluates the significance of the find and determines and implements the appropriate treatment and disposition in accordance with the Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation.

If ground-disturbing activities uncover cultural artifacts or features (including but not limited to dark soil containing shellfish, bone, flaked stone, groundstone, or deposits of historic ash), when a qualified Cultural Resource Specialist in not onsite, [insert who] will be contact the CSP Representative immediately and [insert who] will temporarily halt or divert work within the immediate vicinity of the find until a qualified Cultural Resource Specialist or archaeologist evaluates the find determines and implements the appropriate treatment and disposition of the find.

It is often difficult in natural settings like Calaveras Big Trees State Park to accurately identify and define archaeological resources. The forest duff, vegetation understory, invasive plants, and ladder fuels tend to impair ground visibility. It is possible that some actions associated with VMP could exposed archaeological resources, thus making the resource more vulnerable to disturbance and destruction. To ensure the protection of archaeological resources possibly exposed during VMP actions, State Parks will implement the following Specific Project Requirement **CULT 4**.

PSR CULT 4 – Historian Post Treatment Inventory

Following the completion of a VMP action, a DPR historian will complete post treatment inventory to identify historic resources exposed during the work and to assess the condition of that resource. The DPR archaeologist will use DPR 523 forms to update the records for previously recorded resources (if needed) and to document those newly discovered.

b) Potential adverse effects to the archaeological resources (documented and undocumented) by vegetation management actions are obvious and range from outright destruction by heavy equipment, to supplanting of artifacts through other, lesser soil disturbing activities, and thus the disruption of provenance. Activities of concern include:

- Use of mechanized equipment and hand tools to thin vegetation, eradicate invasive plant species, reduce ladder fuels, and duff clearing.
- Replanting native species
- Prescribed burns and slash burning

- Access and staging,
- Construction of skid trails and landings
- Tree felling and tree girdling

Other impacts are less clear such as the possible effects from heating and smoke exposure from burning, or utilization of herbicides.

Potential negative impacts produced by each activity in the various locations throughout the park requires assessment on a case-by-case basis (treatment type and location) in order to develop the appropriate CEQA compliance determination. Implementation of Specific Project Requirements **CULT 5-7** and Standard Project Requirements **CULT 9-11** described below would reduce potential adverse impacts to archaeological resources to a less-than-significant level.

PSR – Review by Archeologist

To ensure the protection of archaeological sites, features, and objects from implementation of the VMP park wide, each treatment location and associated vegetation management action(s) will be considered an individual project and as such, each location/action(s) will require review by a DPR archaeologist.

PSR CULT 6 – Archeological Resources Protection

All archaeological resources within the identified Area of Potential Effect (APE) will be protected according to project protective measures developed by the DPR archaeologist. To identify the types, numbers, and significance of the archaeological resources in each VMP treatment area, assess impacts, and to develop appropriate protective measures (specific to archaeological resources(s), VMP planned activity, and location), the following tasks are required prior to implementation of vegetation management actions, where appropriate.

- **Archival research relevant to the identified vegetation treatment area**
- **Native American consultation**
- **Field investigation including archaeological survey to identify documented and undocumented cultural resources in the APE.**
- **Documentation of archaeological resources (DPR 523 forms)**
- **Report of findings with GIS generated maps plotting the cultural resources.**
- **Develop resource protective measures to insure impacts will be maintained at a less than significant level.**

PSR CULT 7 – Archeologist Consultation

Prior to implementation of the various VMP activities, a DPR archaeologist will consult with the project manager to identify all resources that must be protected and how they will be protected (fencing, flag and avoid, clearing, wrapping, etc.) in the area identified for treatment.

It is often difficult in natural settings like Calaveras Big Trees State Park to accurately identify and define archaeological resources. The forest duff, vegetation understory, invasive plants, and ladder fuels tend to impair ground visibility. It is possible that some actions associated with VMP could exposed archaeological resources, thus making the resource more vulnerable to disturbance and destruction. To ensure the protection of archaeological resources possibly exposed during VMP actions, State Parks will implement the following Specific Project Requirement **CULT-8**.

PSR CULT 8 – Archeologist Post Treatment Inventory

Following the completion of a vmp action, a dpr archaeologist will complete post treatment inventory to identify historic resources exposed during the work and to assess the condition of that resource. The DPR archaeologist will use DPR 523 forms to update the records for previously recorded resources (if needed) and to document those newly discovered.

If cultural resources are exposed during implementation of a VMP action, implementation of Standard Project Requirement **CULT-9** would reduce potential impacts to a less than significant level.

c) No human remains or burial sites have been documented or are known to exist in the park. Impacts from project work are not anticipated; however, if any human remains or burial artifacts are identified, implementation of Standard Project Requirement **CULT-10** will reduce the impact to a less than significant level.

SPR CULT 10 – Discovery of Human Remains

In the event that human remains were discovered, work would cease immediately in the area of the find and the project manager/site supervisor would notify the appropriate DPR personnel. Any human remains and/or funerary objects would be left in place or returned to the point of discovery and covered with soil. The DPR Sector Superintendent (or authorized representative) would notify the County Coroner, in accordance with §7050.5 of the California Health and Safety Code, and the Native American Heritage Commission (or Tribal Representative). If a Native American monitor is on-site at the time of the discovery, the monitor would be responsible for notifying the appropriate Native American authorities.

The local County Coroner should make the determination of whether the human bone is of Native American origin. In many of California's historic townsites and rural communities discoveries have been made of non-Native American human bone including non-Anglo.

If the coroner or tribal representative determines the remains represent Native American interment, the NAHC in Sacramento and/or tribe would be consulted to identify the most likely descendants and appropriate disposition of the remains. Work would not resume in the area of the find until proper disposition is complete

(PRC §5097.98). No human remains or funerary objects would be cleaned, photographed, analyzed, or removed from the site prior to determination

If it is determined the find indicates a sacred or religious site, the site would be avoided to the maximum extent practicable. Formal consultation with the State Historic Preservation Office and review by the Native American Heritage Commission/Tribal Cultural representatives would also occur as necessary to define additional site mitigation or future restrictions.

d) DPR's Central Valley District contacted the Native American Heritage Commission (NAHC) in March 2017 requesting a list of tribes with traditional lands or cultural places located within the boundaries of Calaveras Big Trees State Park Vegetation Management Plan project area. The NAHC responded to the request on March 29, 2017 and provided a list of seven tribes affiliated with the area. The district sent letters to the tribes on April 13, 2017 requesting information on potential Tribal Cultural Resources within the project area and consultation outreach with the various tribal groups. To date, DPR has not received comments from any of the seven tribes contacted for this project. To insure Tribal Cultural Resources are considered during the CEQA process during these phased project activities, Project Specific Requirement **CULT 11** will ensure that potential impacts will remain at a less than a significant level.

SPR CULT 10 – Tribal Cultural Resources

Vegetation management activities proposed in various locations throughout the park requires Native American consultation of a case-by-case basis (treatment type and location) in order to develop the appropriate CEQA compliance determination concerning Tribal Cultural Resources. Prior to implementation of vegetation management activities the following task will be necessary:

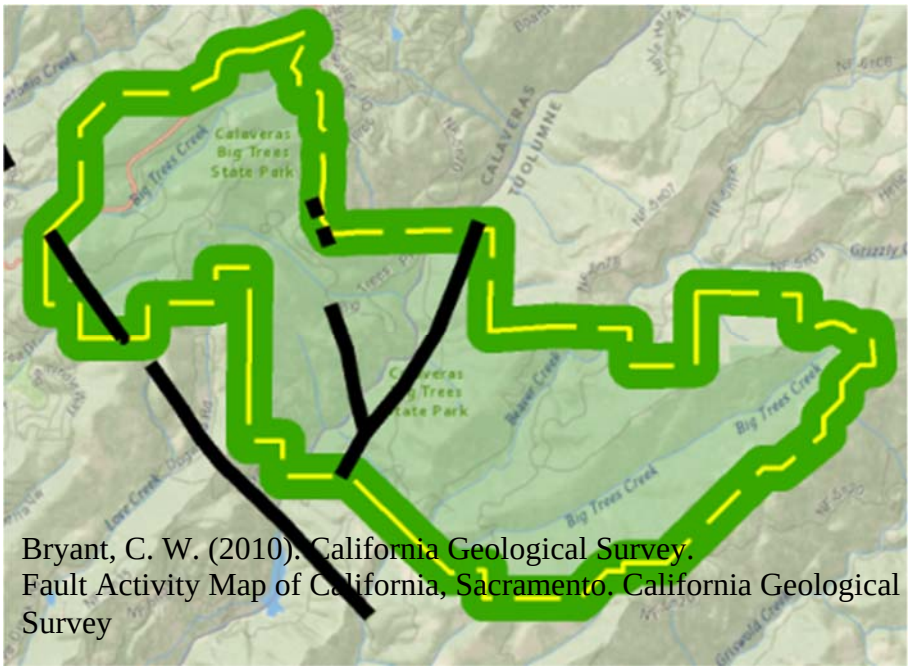
- **DPR will contact the NAHC for the most up to date list of tribes affiliated with the project area prior to implementation of a planned vegetation management activity (treatment type and location).**
- **DPR will contact the tribes on the list through letters initially and follow up with emails and phone calls.**
- **Once DPR addresses tribal concerns and consultation efforts are complete, the planned vegetation management activity can move forward.**

F. Geology And Soils.

ENVIRONMENTAL SETTING

Geology

Calaveras Big Trees State Park is located between Calaveras and Tuolumne counties. This area is within the Sierra Nevada Geomorphic province. Rock units within the park consists of Surficial Deposits, Eureka Valley Tuff, Table Mountain Latite, Mehrten formation, granitic rocks, and Paleozoic metamorphic rocks of the Shoo Fly Complex. Surficial Deposits, Eureka Valley Tuff, Table Mountain Latite, and Mehrten formation are thought to be from the Cenozoic era, Tertiary period. The granitic rocks are from the Mesozic era, Jurassic period and metamorphic rocks are from the Paleozoic era, pre-Silurian (Leivas, 1983).



Bryant, C. W. (2010). California Geological Survey. Fault Activity Map of California, Sacramento. California Geological Survey

Figure 11-Fault Activity Map of CBTSP.

Seismicity

The project site not located within an Alquist-Priolo Earthquake Fault Zone. No active faults with the potential for surface fault rupture are known to occur within the State Park. However, the Park has pre-Quaternary faults (older than 1.6 million years old) (Bryant, 2010). Due to soil and vegetation cover in the area, it is possible that concealed faults may exist (Leivas, 1983). The closest active faults are the Foothills Fault system (Melones and Bear Mountains Fault Zones), located approximately 20 miles to the west. Based on the California Geological Survey's Earthquake Shaking Potential for California Map sheet 48, the State Parks is expected to experience lower levels of shaking less frequently from anticipated future earthquakes. In most earthquakes, only weaker, masonry buildings would be damaged. However, very infrequent earthquakes could still cause strong shaking in this region (D. Branum, 2016).

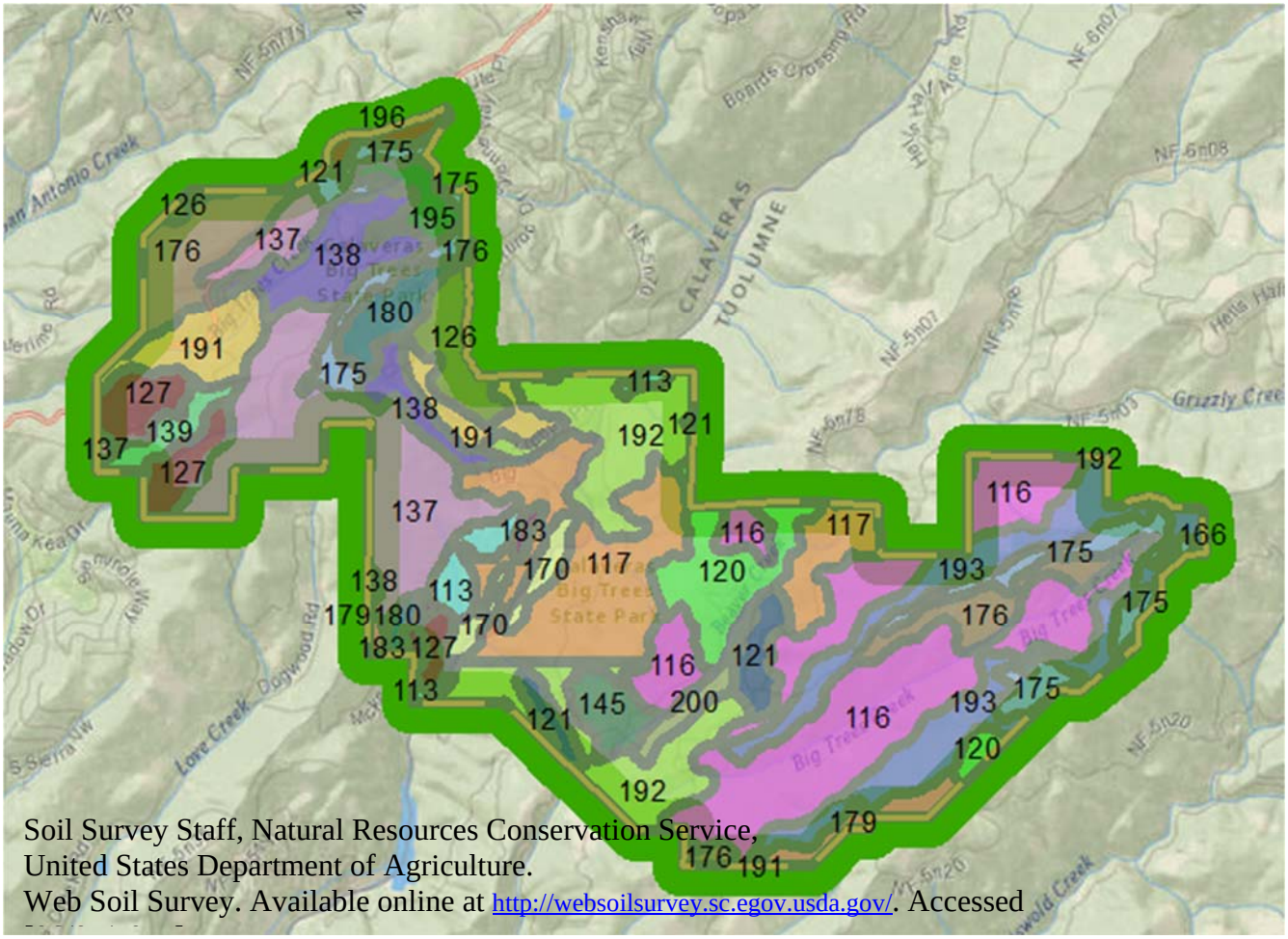
Topography

Calaveras Big Trees State Park is located on the west flank of the Central Sierra Nevada with elevations ranging from 3400 to 5560 feet (Leivas, 1983). The Park is located approximately four miles northeast of the town of Arnold, and just east of Highway 4 near the main park entrance and visitor center. The topographic features of the park are generally characterized by long, relatively flat-topped, northeast-southwest trending ridges with steep slopes. The narrow

canyon bottoms are generally drained by shallow, fast-moving streams. Streams originating outside of Calaveras Big Trees and flowing through the park generally flow in a southwest direction parallel to this stretch of the North Fork of the Stanislaus River (Leivas, 1983).

Soils

Calaveras Big Trees State Park is located in the Natural Resource Conservation Service's major land resource areas of soil survey region 2, Pacific Region. The State Park is within "Sierra Nevada Mountains" region, unit CA731 "Stanislaus National Forest, California, Parts". Web Soil Survey has identified twenty-three soil maps units for the project area. No evidence of expansive soils has been observed at the Park (Leivas, 1983). These include the following Map units:



Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.sc.egov.usda.gov/. Accessed

Figure 12-Web Soil Survey for CBTSP.

(113) Fiddletown, moderately Deep-Ovall Families Complex, 35 to 50 Percent Slopes

These soils can be found at elevations of 3,000 feet to 5,000 feet. These soil units are not considered prime for farmland classification and are not hydric soils. The composition of this map unit consists of 50 percent Fiddletown family, 30 percent of this map unit consists of the

moderately deep-Ovall family complex and similar soils, and 20 percent of the soil is composed of minor components.

Fiddletown family soil units are found on mountain landforms. These soils are well drained and have a depth to water table of more than 80 inches. Additionally, 30 percent of this map unit consists of the moderately deep-Ovall family complex and similar soils. The soil setting for Ovall family complex is mountain landforms. This soil unit is well drained and has a medium runoff class (USDA, Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts, 2016).

(116) Gerle Family, Deep, 5 to 35 Percent Slopes
These soils can be found at elevations of 5,000 feet to 7,440 feet and have a medium runoff class. These soils units are not considered prime for farmland classification. The composition of this map unit consist of 75 percent Gerle family, deep and similar soils, and 25 percent minor components. Gerle Family, Deep soil units are associated with moraine landforms and do not have a hydric soils rating. These soils are well drained and have a depth to water table of more than 80 inches (USDA, Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts, 2016).

(117) Gerle Family, Deep, 35 to 50 Percent Slopes
These soils can be found at elevations of 5,000 feet to 7,440 feet and have a medium runoff class. These soils units are not considered prime for farmland classification. The composition of this map unit consist of 75 percent Gerle family, deep and similar soils, and 25 percent minor components. Gerle Family, Deep soil units are associated with moraine landforms and do not have a hydric soils rating. These soils are well drained and have a depth to water table of more than 80 inches (USDA, Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts, 2016).

(120) Gerle, Deep-Wintoner Families Complex, 5 to 35 Percent Slopes
These soils can be found at elevations of 5,000 feet to 7,000 feet and have a medium runoff class. These soils units are not considered prime for farmland classification. The composition of this map unit consist of 40 percent Gerle family, deep and similar soils, 25 percent Wintoner family and similar soils, and 35 percent minor components.

Gerle Family, Deep soil units are associated with moraine landforms and do not have a hydric soils rating. These soils are well drained and have a depth to water table of more than 80 inches.

Wintoner Family soil units are associated with moraine landforms and do not have a hydric soils rating. They are well drained soils with a very high runoff class (USDA, Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts, 2016).

(121) Gerle, Deep-Wintoner Families Complex, 35 to 50 Percent Slopes

These soils can be found at elevations of 5,000 feet to 7,000 feet and have a medium runoff class. These soils units are not considered prime for farmland classification. The composition of this map unit consist of 40 percent Gerle family, deep and similar soils, 25 percent Wintoner family and similar soils, and 35 percent minor components.

Gerle Family, Deep soil units are associated with moraine landforms and do not have a hydric soils rating. These soils are well drained and have a depth to water table of more than 80 inches.

Wintoner Family soil units are associated with moraine landforms and do not have a hydric soils rating. They are well drained soils with a very high runoff class (USDA, Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts, 2016).

(126) Holland Family, Deep, 5 to 35 Percent Slopes
These soils can be found at elevation 3000 feet to 5000 feet and have a high runoff class. These are not considered prime for farmland classification. The composition of this map unit consists of 75 Holland family, deep and similar soils, and 25 percent minor components. Holland Family, Deep soils are associated with mountain landforms and do not have a hydric soils rating. They are well drained soils with a high run off class (USDA, Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts, 2016).

(127) Holland Family, Deep, 35 to 50 Percent Slopes
These soils can be found at elevation 3000 feet to 5000 feet and have a high runoff class. These are well drained soils and not considered prime for farmland classification. The composition of this map unit consists of 75 Holland family, deep and similar soils, and 25 percent minor components. Holland Family, Deep soils are associated with mountain landforms and do not have a hydric soils rating (USDA, Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts, 2016).

(137) Holland, deep dark Surface-moderately Deep Dark Surface-McCarthy, Moderately Deep Families Complex, 5 to 35 Percent Slopes
These soils can be found at elevation 3000 feet to 6000 feet and have a high runoff class. These are not considered prime for farmland classification. The composition of this map unit consists of 40 Holland family, deep and similar soils, 30 percent Holland family, moderately deep, dark surface, and similar soils, 20 percent McCarthy family and 10 percent minor components. These soils are associated with mountain landforms and do not have a hydric soils rating. (USDA, Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts, 2016).

(138) Holland, deep dark Surface-moderately Deep Dark Surface-McCarthy, Moderately Deep Families Complex, 35 to 50 Percent Slopes
These soils can be found at elevation 3000 feet to 6000 feet and have a high runoff class. These are not considered prime for farmland classification. The composition of this map unit

consists of 30 Holland family, deep dark surface, and similar soils, 25 percent Holland family, moderately deep, dark surface, and similar soils, 20 percent McCarthy family and 25 percent minor components. These soils are associated with mountain landforms and do not have a hydric soils rating. (USDA, Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts, 2016).

(139) Holland family, Moderately Deep-deep Complex, 5 to 35 Percent Slopes
These soils can be found at elevation 3000 feet to 6000 feet and have a high runoff class. These are not considered prime for farmland classification. The composition of this map unit consists of 40 percent Holland family, moderately deep, dark surface, and similar soils, 30 Holland family, deep, and similar soils, and 30 percent minor components. These soils are associated with mountain landforms and do not have a hydric soils rating. (USDA, Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts, 2016).

(145) Hugo-Holland family, Deep-wilder families Complex, 5 to 35 Percent Slopes
These soils can be found at elevation 3000 feet to 5500 feet and have a high runoff class. These are not considered prime for farmland classification. The composition of this map unit consists of 30 percent Hugo family and similar soils, 25 Holland family, deep, and similar soils, and 20 percent Wilder family and similar soils, and 25 percent minor components. These soils are associated with mountain landforms and do not have a hydric soils rating. (USDA, Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts, 2016).

(170) Lithic Xerumbrepts-Fiddletown Family, Moderately Deep-Rock Outcrop Copmlex,3 5 to 70 Percent Slopes
These soils can be found at elevation 3500 feet to 7000 feet and have a medium runoff class. These are not considered prime for farmland classification. The composition of this map unit consists of 40 percent Lithic xerumbrepts and similar soils, 20 Fiddletown family, moderately deep, and similar soils, 20 percent rock outcrop, and 20 percent minor components. These soils are associated with mountain landforms and do not have a hydric soils rating. (USDA, Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts, 2016).

(175) Lithic Xerumbrepts-Rock Outcrop-McCarthy family, Moderately Deep Complex 5 to 60 Percent Slopes
These soils can be found at elevation 3000 feet to 7000 feet and have a medium runoff class. These are not considered prime for farmland classification. The composition of this map unit consists of 40 percent Lithic xerumbrepts and similar soils, 20 McCarthy family, moderately deep, and similar soils, 20 percent rock outcrop, and 20 percent minor components. These soils are associated with mountain landforms and do not have a hydric soils rating. (USDA, Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts, 2016).

(179) McCarthy family, Moderately Deep-deep Complex, 5 to 35 Percent Slopes,
These soils can be found at elevation 3000 feet to 6000 feet and have a medium runoff class. These are not considered prime for farmland classification. The composition of this map unit consists of 60 percent McCarthy family, moderately deep, and similar soils, 25 percent McCarthy family, deep, and similar soils, and 15 percent minor components. These soils are associated with mountain landforms and do not have a hydric soils rating. (USDA, Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts, 2016).

(180) McCarthy family, Moderately Deep-deep Complex, 35 to 60 Percent Slopes
These soils can be found at elevation 3000 feet to 6000 feet and have a medium runoff class. These are not considered prime for farmland classification. The composition of this map unit consists of 85 percent rock outcrop, and 15 percent minor components. These soils are associated with mountain landforms and do not have a hydric soils rating. (USDA, Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts, 2016).

(183) Rock Outcrop
Found on mountain landforms with slopes of 0 percent to 150 percent. This rock outcrop is composed of granite rock and is excessively drained.

(191) Wilder-Ovall familis Complex, 5 to 35 Percent Slopes
These soils can be found at elevation 3000 feet to 5430 feet and have a medium runoff class. These are not considered prime for farmland classification. The composition of this map unit consists of 50 percent Wilder family and similar soils, 30 percent Ovall family and similar soils, and 20 percent minor components. These soils are associated with mountain landforms and do not have a hydric soils rating. (USDA, Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts, 2016).

(192) Wilder-Ovall families Complex, 35 to 50 Percent Slopes
These soils can be found at elevation 3000 feet to 5430 feet and have a medium runoff class. These are not considered prime for farmland classification. The composition of this map unit consists of 50 percent Wilder family and similar soils, 30 percent Ovall family and similar soils, and 20 percent minor components. These soils are associated with mountain landforms and do not have a hydric soils rating. (USDA, Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts, 2016).

(193) Windy family, Deep-Moderately Deep Complex, 5 to 35 Percent Slopes
These soils can be found at elevation 4190 feet to 8000 feet and have a medium runoff class. These are not considered prime for farmland classification. The composition of this map unit consists of 50 percent Windy family, deep, and similar soils, 25 percent Windy family, moderately deep, and similar soils, and 25 percent minor components. These soils are associated with mountain landforms and do not have a hydric soils rating. (USDA, Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts, 2016).

(195) Windy family, Moderately Deep-deep Complex, 5 to 35 Percent Slopes
These soils can be found at elevation 4190 feet to 8000 feet and have a medium runoff class. These are not considered prime for farmland classification. The composition of this map unit consists of 50 percent Windy family, deep, and similar soils, 30 percent Windy family, moderately deep, and similar soils, and 20 percent minor components. These soils are associated with mountain landforms and do not have a hydric soils rating. (USDA, Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts, 2016).

(196) Windy family, Moderately Deep-deep Complex, 35 to 50 Percent Slopes
These soils can be found at elevation 4190 feet to 8000 feet and have a medium runoff class. These are not considered prime for farmland classification. The composition of this map unit consists of 50 percent Windy family, deep, and similar soils, 30 percent Windy family, moderately deep, and similar soils, and 20 percent minor components. These soils are associated with mountain landforms and do not have a hydric soils rating. (USDA, Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts, 2016).

(200) Xerolls, 1 to 10 Percent Slopes
These soils can be found at elevation 3000 feet to 5000 feet and have a medium runoff class. These are not considered prime for farmland classification. The composition of this map unit consists of 90 percent Xerolls and similar soils, and 10 percent minor components. These soils are associated with basin floor landforms and do not have a hydric soils rating. (USDA, Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts, 2016).

Slope Stability
Landslide problems are not widespread within the Park, although there are two landslide areas and generally active slides located on the Calaveras County side and along the Parkway. Historic (ca. 1960) road management called for the toes of these slides to be cut back from the Parkway as they intruded, but it was later understood that this only served to stimulate further downslope movement, and when this cutting ended the slides stabilized.

Indications of slumping are found along the Parkway on the Tuolumne County side from Oak Leaf Springs ridge along the Beaver Creek drainage, mostly as arcuate cracks and slight depressions occurring in the pavement. One minor slide occurred near Oak Leaf Springs in the 1990s, closing the road until repairs could be made.

WOULD THE PROJECT:	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, issued by the State Geologist for the area, or based on other substantial evidence of a known fault? (Refer to Division of Mines and Geology Special Publication 42.)	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable, as a result of the project and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1997), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste disposal systems, where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site, or unique geologic feature?	☐	☐	☐	☒

DISCUSSION

a) The project site located within an area of relatively low seismicity. The possibility of earthquake-induced effects such as surface rupture, strong ground shaking, or liquefaction and lateral spreading are low at this site. An earthquake on any of the above-mentioned faults would likely be felt at the State Park, but ground shaking would be minimal. See individual responses to items a (I-IV) below.

I. The project site is not located within an Alquist-Priolo Earthquake Fault Zone (APEFZ) as designated by the California Geological Survey. Therefore, there is no risk of surface rupture as a result of this project. No Impact.

II. Based on the California Geological Survey's Earthquake Shaking Potential for California Map sheet 48, the State Parks is expected to experience lower levels of shaking less frequently from anticipated future earthquakes. The shaking potential is calculated as the level of ground motion that has a 2% chance of being exceeded in 50 years, which is the same as the level of ground-shaking with about a 2500-year average repeat time (D. Branum, 2016). No impact.

III. Seismic-induced ground failure, such as liquefaction, usually occur in unconsolidated granular soils that are water saturated. During seismic-induced ground shaking, pore water pressure can increase in loose soils, causing the soils to change from a solid to a liquid state (liquefaction). Based on the natures of the project, (vegetation management), this project will not result in strong seismic ground shaking. No Impact.

IV. Landslide problems are not widespread within the Park, although there are two significant and generally active slides located on the Calaveras County side and along the Parkway. Implementation of **PSR GEO 1 and PSR HYDRO 1** will ensure that exposure to landslide will not occur as a result of this project. BMPs will be in place to prevent any slope failures caused by excess water on exposed slopes. Therefore, there is a less than Significant Impact from landslides as a result of this project.

PSR GEO 1 – Soil Disturbance and Burn Unit Size

In order to prevent unnecessary soil disturbance, burn units smaller than 10 acres (4 ha) should either be a segment of a series of contiguous units to be treated as a whole, or as a training burn.

PSR HYDRO 1 – Erosion Control and Pollution Prevention

Burn boss shall implement a Storm Water Soil Loss Prevention Plan (SWSLPP) that includes monitoring the weather forecast, conducting site inspections before, during, and after storm events.

CSP will cease vegetation management activities if measurable rain event with 20% or greater probability is predicted within 24 hours. This probability is expected to be the threshold for creating runoff at the burn site, and will be determined by monitoring the National Weather Service's forecast for the project area. CSP defines "measurable rain" as any rainfall that can be detected. Protective measure to prevent water-quality alterations resulting from soil erosion and sedimentation will be implemented and maintained. Burn boss shall perform daily inspections of sediment-control devices during storm events.

Burn operations, such as stockpiling of materials, storage of portable equipment, vehicles, and supplies shall be restricted to the designated staging areas. If no

staging area is defined, then all staging areas will be limited to the hardened surfaces of roads, parking areas unless reviewed and approved by the DPR Archeologist, and Environmental Scientist assigned to the project. All operations shall be confined to the minimal area necessary. Ground disturbance in the floodplain shall be limited to the minimum necessary to achieve the project goal.

Prior to the start of any ground-disturbing activities, the burn boss shall prepare and submit a Storm Water Pollution Prevention Plan (SWPPP) for DPR approval that identifies temporary Best Management Practices (BMPs) and permanent (e.g., preserving or planting of vegetation) for use in all burn areas to reduce or eliminate the discharge of soil, surface water runoff, and pollutants during all excavation, grading, trenching, repaving, or other ground-disturbing activities. The SWPPP will include BMPs for hazardous waste and contaminated soils management and a Spill Prevention and Control Plan (SPCP), as appropriate.

b) A temporary increase in erosion may occur in some park locations as result of vegetation management activities. However, Implementation of **PSR HYDRO 1** will prevent substantial soil erosion or loss of topsoil resulting in a Less than Significant Impact.

c) Vegetation management activities will not result in landslides, lateral spreading, subsidence, collapse or liquefaction. Due to the nature of this project, (vegetation management) ground disturbance will be minimal. No Impact.

d) No evidence of expansive soils has been observed at the Park (Leivas, 1983). No Impact.

e) The project does not involve the installation of a septic system or leach field. No Impact.

f) No known paleontological resources exist within the project area, nor are they likely to be encountered by vegetation management activities. No Impact.

G. Greenhouse Gas Emissions

ENVIRONMENTAL SETTING

California is the fifteenth largest emitter of greenhouse gases (GHGs) in the world, representing about two percent of worldwide emissions. In an effort to help curb global warming, the state enacted new laws regulating GHGs in 2006. Assembly Bill 32, the Global Warming Solutions Act, requires the State to implement a series of actions to achieve a reduction in GHG emissions to 1990 levels by 2020 (California Environmental Protection Agency, 2017).

Through AB 32, the statewide cap for 2020 GHG emissions has been set at 427 million metric tons of carbon dioxide equivalents (MMTCO2E). Reducing GHG emissions to this level means cutting approximately 30% from business-as-usual emission levels projected for 2020, or about 10% from today's levels. On a per capita basis, that means reducing our annual emissions of 14 tons of carbon dioxide for every person in California down to about 10 tons per person by 2020 (California Environmental Protection Agency, 2017).

In December 2009, the Natural Resource Agency adopted amendments to the *Guidelines for Implementation of the California Environmental Quality Act* addressing the significance of impacts for greenhouse gas emissions (California Natural Resources Agency, 2009). Section 15064.4 of the amended CEQA Guidelines states: "A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project."

The project site is located in Calaveras and Tuolumne Counties, approximately 3 miles north-northeast of the community of Arnold, within the Mountain Counties Air Basin (MCAB). The Calaveras County Air Pollution Control District and the Tuolumne County Air Pollution Control District are the regional environmental regulatory agencies (of thirty-five local air agencies in California) whose primary responsibility is controlling air pollution from stationary sources.

AS noted in the Air Quality Section of this document, within the two county project area ozone is designated as nonattainment; $PM_{2.5}$ is designated as unclassified; PM_{10} is designated as nonattainment in Calaveras County and unclassified in Tuolumne County. Carbon monoxide is designated as attainment in Tuolumne but as unclassified in Calaveras County. Nitrogen dioxide, sulfur dioxide, sulfates and lead are designated as attainment and hydrogen sulfide and VRPs are designated as unclassified (Air Resources Board, 2016). The two pollutants of greatest concern are ozone and particulate matter. The Counties sunny climate, location adjacent to the San Joaquin Valley with pollution trapping mountains and valleys and increasing population all contribute to increased levels.

California State Parks (CSP) has developed a "Cool Parks" initiative to address climate change within the State Park system. Cool Parks proposes that CSP itself as well as resources under its care adapt to the environmental changes resulting from climate change. In order to fulfill the Cool Parks initiative, CSP is dedicated to using alternative energy sources, low emission vehicles, recycling and reusing supplies and materials, and educating staff and visitors on climate change (CSP, 2008).

	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
WOULD THE PROJECT:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environmental?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Criteria for Determining Significance

The analysis of determining the significance of impacts of the Proposed Action to Greenhouse Gas Emissions is based on criteria **VII** a-b, described in the environmental checklist above.

DISCUSSION

a) i) Greenhouse Gas Emissions: In 2002 the California legislature declared that global climate change was a matter of increasing concern for the state's public health and environment, and enacted laws requiring the state Air Resources Board (ARB) to control GHG emissions from motor vehicles (Health & Safety Code §32018.5 et seq.). CEQA Guidelines define greenhouse gases to include carbon dioxide (CO2), nitrous oxide (N2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The California Global Warming Solutions Act of 2006 (Assembly Bill 32) definitively established the state's climate change policy and set GHG reduction targets (Health & Safety Code §38500 et seq.). The State set its target at reducing greenhouse gases to 1990 levels by 2020.

According to Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate change in CEQA Documents (March 5, 2007), an individual project does not generate enough GHG emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may participate in a potential impact through its incremental contribution combined with the contributions of all other sources of GHG. In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable." (CEQA Guidelines §15064(i)(1) and §15130).

In 2011, the State modified Section 15064.4 Appendix G of the CEQA Guidelines, to include thresholds of significance for Greenhouse Gases. The project would have potential significant impacts if the project would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment;
- Conflict with an applicable plan, policy or regulation adopted for reducing the emissions of greenhouse gases.

Due to the nature of the proposed project (Vegetation Management Plan), DPR has determined that it is appropriate to assess potential GHG impacts qualitatively – as allowed by CEQA Guidelines §15064.4(a)2.

The proposed project could produce GHGs when conducting prescribed burns or burning slash piles. Work permitted under the VMP would be ongoing. However, as noted in the Air Quality Section of this report, prescribed burns contribute far less C02 or ozone than what wildland fires generate. As such, individual prescribed burn projects implanted under the Plan would reduce the potential release of greenhouse gas emissions. Therefore, the Plan would not significantly increase greenhouse emissions.

ii) Climate Change and Sea Level Rise - Because of the project's location and nature of the project itself, the project will not contribute to sea level rise nor will it be susceptible to it. Therefore, no impact.

b. The State has not developed specific GHG thresholds of significance for use in preparing environmental analyses under CEQA, and the Calaveras County Air Pollution Control District has not adopted GHG thresholds to determine significance. Tuolumne County has not yet established a threshold but is currently undergoing a General Plan Update process where this threshold may be established (Shields, 2017). The Association of Environmental Professionals' document *Alternative Approaches to Analyzing Greenhouse Gas Emissions and Global Climate Change in CEQA Documents,* states that emissions for criteria pollutants tend to follow similar patterns as the emissions for GHG emissions" (AEP, 2007). Therefore, it is reasonable to assume that if all other pollutants from the Project are determined to be less than significant, the CO_2 emissions will also be less than significant. Projects undertaken under the VMP would not violate the air quality standards of Calaveras or Tuolumne Counties and would not result in a cumulatively considerable increase in emissions. Therefore, approval of the VMP would not generate significant GHG emissions and would therefore not conflict with the current State and County guidelines or any applicable plans, policies or regulations concerning GHG emissions.

   To ensure that GHG emissions resulting from management efforts allowed under the VMP, the project would implement **Project Specific Requirements AIR 1** – **AIR 7**Implementation of these project requirements would ensure that the project would have a less than significant impact.

H. Hazards and Hazardous Materials.

ENVIRONMENTAL SETTING

Hazardous materials include all flammable, reactive, corrosive, or toxic substances, which, because of these properties, pose potential harm to the public or environment. Hazardous materials such as agricultural chemicals, pesticides, and various commercial chemical substances may be used, stored, or produced in CBTSP.

The California Department of Environmental Protection (CALEPA) has the responsibility for compiling (pursuant to Government Code §65962.5) information on hazardous material sites in California that together are known as the "Cortese" list. A review of this Cortese list(s) found there are no known hazardous sites within the project area (California Department of Toxic Substances Control, n.d.).

Airports

The nearest airport is the Columbia Airport is located approximately 16.5 miles (diagonally) from the project site. The airport is owned and operated by Tuolumne County, open for public use and flights are restricted to daylight hours (AirNav.com, 2017).

Fire Hazards

The California Department of Forestry and Fire Protection (CalFire) lists the fire hazard severity for CBTSP as Very High (CalFire, 2007) and is designated as a State Responsibility Area in the event of a fire.

Schools

The nearest school, Hazel Fischer Elementary School, is located approximately 3.5 miles from the proposed project site in the community of Arnold.

	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
WOULD THE PROJECT:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials, substances, or waste into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of	☐	☐	☐	☒

	hazardous materials sites, compiled pursuant to Government Code §65962.5, and, as a result, create a significant hazard to the public or environment?				
e)	Be located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport? If so, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☒	☐
f)	Be located in the vicinity of a private airstrip? If so, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
	LESS THAN				
g)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☐
h)	Expose people or structures to a significant risk of loss, injury, or death from wildland fires, including areas where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☐

Criteria for Determining Significance

The analysis of determining the significance of impacts of the Proposed Action to Hazards and Hazardous Materials is based on criteria **VIII** a-h, described in the environmental checklist above.

DISCUSSION

a) Undertaking projects under the approved VMP is not expected to create a hazard to the public due to routine use of hazardous materials. Hazardous materials including gasoline, oil, and hydraulic fluid, are already routinely used in the course of the operation of CBTSP and would be used to conduct mechanical thinning of vegetation. The District already maintains a spill prevention plan and with implementation of **Project Specific Requirement HAZ - 1 Hazardous Materials,** impacts from the project remain less than significant.

SPR HAZ 1 – Hazardous Materials

All refueling/servicing of equipment, solid waste disposal and worksite sanitation stations should occur in designated staging areas and away from flowing water.

b) Vegetation management has been an ongoing effort at CBTSP perhaps since its establishment as a State Park. The VMP defines goals for the plant communities in terms of a desired condition for each, describes the range of acceptable management practices, and establishing guidelines for how and when they are to be used, and describes any constraints that may limit their application. Therefore, implementation of the VMP will not introduce new risks of creating significant hazards to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials, substances, or waste into the environment. Less than Significant.

c) The project is not located within one-quarter mile of any school and no schools are proposed for this area. No impact.

d) CBTSP is not included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5. No area within the project site is currently restricted or known to have hazardous materials present. The existing spill prevention plan requires the cleanup of hazardous materials. Therefore, no impact would occur with project development.

e) As noted in the Environmental Setting above, the nearest public airport is over 15 miles away and thus outside of the designated referral area for the Columbia Airport. As such, the proposed Project would not result in a safety hazard due to the proximity of the airport; this impact would be less than significant.

f) The project is not located within two miles of a private airstrip. No impact.

g) All prescribed burns conducted pursuant to the plan will be done under permit from Cal Fire. Therefore, the impact from approval of the VMP would be less than significant.

h) As noted in the Air Quality Section above, performing smaller scale prescribed burns effectively reduces the potential for catastrophic wildland fires. Furthermore, prescribed burn projects implemented under the VMP shall be subject to **Project Specific Requirement HAZ 2**, which will ensure that impacts from fire will remain at a less than significant level.

SPR HAZ 2 – FIRE PREVENTION

- **Obtain a burn permit from CAL FIRE.**
- **Plan burning to take into account weather, time of year, and fuel conditions so that these help achieve the desired results and minimize effects on water quality. Evaluate ground conditions to control the pattern and timing of the burn.**
- **Execute the prescribed burn with a qualified crew and burn boss.**
- **Have firefighting equipment readily available**
- **Time prescribed fires so that the moisture level of the forest floor prevents the entire humus layer from being burned**

I. Hydrology and Water Quality.

ENVIRONMENTAL SETTING

Climate and Precipitation

Along with much of California, the western slope of the Sierra Nevada is in a region of Mediterranean climate, with typically warm, dry summers and cool, wet winters. Precipitation at the Park falls mainly as rain, although snow is frequent during the winter, and in some years may be heavy. In 2016, the Park received approximately 11.5 inches of snow fall in the month of November (NOAA, 2016). Temperatures are mild throughout the year, rarely rising over 100◦F, and only occasionally dropping below 20◦F as shown in **Table 1**.

Table 1 - Temperature (F) at Calaveras Big Trees State Park

Month	Temp. Mean Max (F)	Temp Mean. Min (F)
Jan	41.8	29.9
Feb	54.5	32.6
Mar	50.5	33.4
Apr	58.9	37.9
May	61.8	42.0
Jun	75.8	50.6
Jul	80.9	55.3
Aug	80.7	56.4
Sep	72.1	48.7
Oct	58.9	40.6
Nov	53.3	35.0
Dec	44.2	28.4
Source: National Oceanic & Atmospheric Administration - Global Summary of the Month for 2016		

Table 2 - Calaveras Big Trees State Park Precipitation Station Data

Month	Total Precipitation (in)
Jan	11.98
Feb	2.04
Mar	13.31
Apr	3.39
May	0.61
Jun	0.00
Jul	0.00
Aug	0.00
Sep	0.00
Oct	12.80
Nov	3.88
Dec	9.15
Source: National Oceanic & Atmospheric Administration - Global Summary of the Month for 2016	

Table 2 shows total precipitation by month (in inches) for the 2016 calendar year at Calaveras Big Trees State Park. The precipitation station is located within Calaveras Big Trees State Park (Calaveras Big Trees, CA US USC00041277), near the Visitors Center (38.2769°, -120.3113°). Based on this data, the highest amount of total precipitation in 2016 occurred between October through March (NOAA, 2016). May through September had the lowest flow of the year.

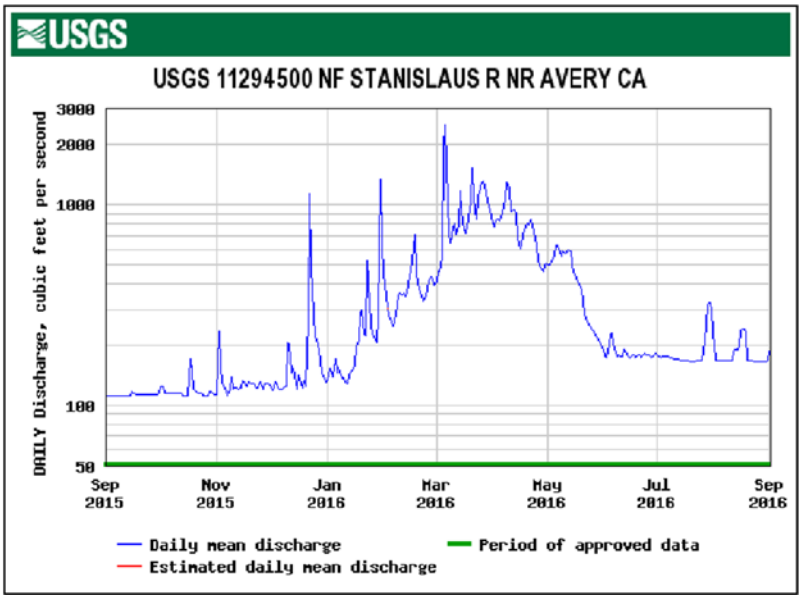


Figure 13 -Stanislaus River Daily Mean Discharge Rates.

Flooding

Based on FEMA Flood Insurance Rate Maps (FIRM) for the State Park (Panels 150, 175, 300, 350, and 375) most of the classified flood zones are within the Calaveras County side of the state park. The Tuolumne County side of the state park is listed as an area of undetermined flood hazard. The Stanislaus River runs through the middle of the park and is categorized as a 100-year flood zone. Additional 100-year flood zone locations along the Calaveras county side of the Park include Big Tree Creek (in the Calaveras North Grove), Oak Hollow Creek, (formerly known as Squaw Hollow Creek) a seasonal stream that flows eastward into the North Fork Stanislaus River and Love Creek.

Figure 1 shows a USGS graph for daily mean discharge rates for the 2016 calendar year at the North Fork Stanislaus River. The stream gage is located just west of the State Park (11294500 NF Stanislaus River NR Avery, CA), approximately 0.2 mile downstream. The North Fork Stanislaus River is the principle hydrologic feature of the Park and flows for approximately 2-1/2 miles through the Park in a southwesterly direction. Please refer to figure 2 for a visual of the stream gage location.

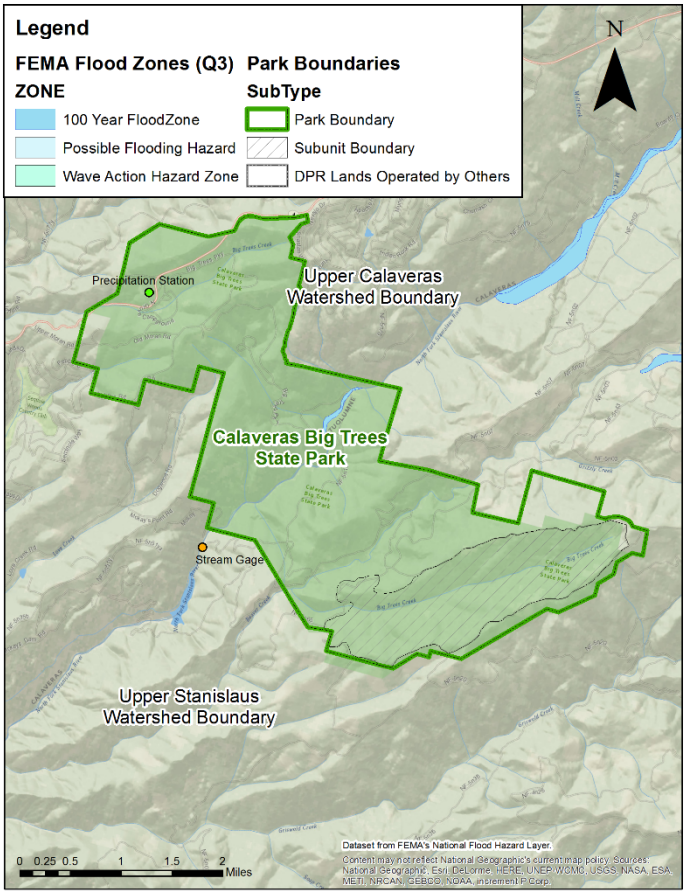


Figure 14-CBTSP Watershed Boundary Map.

At the Hydrologic Unit Code 8 (HUC 8) level, Calaveras Big Trees State park is split between the Upper Calaveras watershed and the Upper Stanislaus watershed (NRCS, 2017). The major topographic feature of Park is a canyon created by the North Fork Stanislaus River, with approximately half of the park draining directly into it, mainly through minor seasonal streams and overland flow. The river courses within the park for 2 ½ miles, dropping in elevation an approximate 250 feet along the way. The North Fork's flow is regulated by four dams located approximately 20 river miles upstream from the park.

The other major watercourse is Beaver Creek. This is a California State Parks Representative Keystone Watershed which represents, physical, biological, and aquatic values characteristic of the ecoregion, a healthy aquatic system with good water quality, is free from serious exotic species problems and extensive land alterations and is linked to other protected areas large enough to sustain species abundance and

variety. This perennial stream runs roughly parallel to the North Fork Stanislaus River about one mile to the southeast, draining 20,299 acres (8,215 hectares) 10% of which is within the Park. Beaver Creek eventually joins the North Fork Stanislaus River downstream from the park boundary (CSP, 2007).

Three other minor drainages occur in the park, two of which are entirely within its borders. Big Trees Creek (in the South Grove Natural Preserve) is the largest of the three, draining an area of about 1,400 acres (570 hectares) and flowing into Beaver Creek while still within the park. Oak Hollow Creek, (formerly known as Squaw Hollow Creek) is a seasonal stream that flows eastward into the North Fork Stanislaus River. Finally, Big Tree Creek starts in the North Grove as a seasonal watercourse, but becomes perennial immediately below the North Grove Meadow, eventually flowing into San Antonio Creek, near the community of White Pines. Various springs are located in the park, some of which have been plumbed as water sources, although only two, Oak Leaf Spring and the headwaters of Oak Hollow Creek are currently maintained as water sources.

Wild and Scenic Rivers

There are no proposed vegetation management activities within a ¼ mile buffer of eligible and designated Wild and Scenic Rivers.

Water Quality

The preparation and adoption of water quality control plans (Basin Plans) are required by California Water Code (Section 13240) and supported by the Federal Clean Water Act. Section 303 of the Clean Water Act requires states to adopt water quality standards which consist of the designated uses of the navigable waters involved and the water quality criteria for such waters based upon such uses.

The state Park is within the San Joaquin River Basin and subject to the Central Valley Regional Water Quality Control Districts (CVRWQCB) Plan for the Sacramento and San Joaquin River Basins. The 2016 Basin Plan identifies the beneficial uses and water quality objectives for surface water bodies in the Central Valley Region. Not all surface waters are specifically identified in the document (CVRWQCB, 2016). **Table 3** below shows the beneficial uses listed for the North Fork Stanislaus River under the 2016 Basin for the Sacramento and San Joaquin River Basins.

Table 3 - North Fork Stanislaus River Beneficial Use

Beneficial Use Types	North Fork Stanislaus River
Municipal and Domestic Supply	X
Agriculture Irrigation	X
Agricultural Stock Watering	X
Industry Process	
Industry Service Supply	
Industry Power	X
Recreational – Body Contact with Water	X

Recreational – No Body Contact with Water	X
Canoeing and Rafting	X
Other Recreational Non-contact Activities	X
Freshwater Warm Habitat	X
Freshwater Cold Habitat	X
Wildlife Migration	
Wildlife Spawning	
Wildlife Habitat	X
Navigation	

The Clean Water Act §303(d) requires states to identify waters within their borders that are not attaining water quality standards. Based on a review of the 2010 Integrated Report on Water Quality with Web-Based Interactive Map, there are no impaired water bodies within Calaveras Big Trees State Park.

Table 4 shows the results of water quality parameters taken by the California Department of Water Resources at the Stanislaus River in Calaveras Big Trees State Park (Station B3211010 STANISLAUS R NF A CALV BIG TREES) in 2015 (DWR, 2015). The North Fork Stanislaus River is the principal hydrologic feature at Calaveras Big Trees State Park. The River flows for 2-1/2 miles through the park, in a southwesterly direction. The following water quality data was taken in May and October of the 2015 calendar year.

Table 4 – 2015 Stanislaus River at Calaveras Big Trees State Park Water Quality Sampling

Water Quality Parameter	Date	Time (PST)	Value/Units
Dissolved Oxygen	10/27/2015	1:40 PM	9.33 mg/l
Dissolved Oxygen	5/5/2015	12:14 PM	10.2 mg/l
Specific Conductance	10/27/2015	4:50 PM	32.5 uS/cm
Specific Conductance	5/5/2015	3:15 PM	27.2 uS/cm
Water Temperature	10/28/2015	4:50 PM	11.4°C
Water Temperature	5/5/2015	3:15 PM	17.7°C
pH	10/27/2015	4:50 PM	8.3
pH	5/5/2015	3:15 PM	7.9

	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
WOULD THE PROJECT:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, in a manner which would result in substantial on- or off-site erosion or siltation?	☐	☐	☒	☐
d) Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in on- or off-site flooding?	☐	☐	☒	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f) Substantially degrade water quality?	☐	☐	☒	☐
g) Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map, or other flood hazard delineation map?	☐	☐	☐	☒
h) Place structures that would impede or redirect flood flows within a 100-year flood hazard area?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury, or death from flooding, including flooding resulting from the failure of a levee or dam?	☐	☐	☐	☒
j) Result in inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

DISCUSSION

a) All activities undertaken by this vegetation management plan (i.e. prescribed fire, prescribed fire with pre-treatment thinning, pile burning with pre-treatment thinning, manual thinning with biomass removal from site, mechanical thinning and removal of large trees, and girdling) will adhere to state and federal policy on water quality standards and discharge requirements. It is the policy of the Department to adopt a comprehensive,

integrative, and cooperative watershed approach to managing watersheds as complete hydrologic systems, and to minimize human disturbance to the natural upland processes that deliver water, sediment, nutrients, and natural debris to streams (CSP C. S., 2004). If it is determined that impacts, as a result of vegetation management activities, are necessary or unavoidable, the department will seek to obtain permits from the appropriate regulatory agencies. Therefore, the project will have a Less than Significant Impact on water quality standards or waste discharge requirements.

Section 404 of the Clean Water Act (CWA) establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Activities in waters of the United States regulated under this program include fill for development, water resource projects, infrastructure development and mining projects. Section 404 requires a permit before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from Section 404 regulation.

To comply with Section 404(d) of the Federal Clean Water Act, authorization from the Secretary of the Army, acting through the Corps of Engineers, is required for the discharge of dredged or fill material into all waters of the United States. Waters of the United States include traditionally navigable waters, interstate waters, their tributaries, and adjacent wetlands. These categories include most wetlands, intermittent and ephemeral streams where there is an established ordinary high water mark, and areas subject to the ebb and flow of the tide.

The State Water Resource Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs) are the primary agencies responsible for protecting water quality in California. The SWRCB and the RWQCBs regulate discharge to surface waters under either the federal Clean Water Act (CWA) or the California Porter-Cologne Water Quality Control Act (Porter-Cologne).

Pursuant to Section 401 of the CWA, projects that require a Corps permit for discharge of dredge or fill material must obtain a water quality certification or a wavier that confirms a project complies with state water quality standards before the Corps permit is valid. The state also maintains independent regulatory over placement of waste, including fill, into waters of the State under the Porter-Cologne Act.

b) Vegetation management activities will not deplete groundwater supplies or interfere with groundwater recharge. Prescribed fire activities related to vegetation management will be small enough to ensure complete spread in one day, and burnout within two days, with fire suppression if necessary. Adherence to **PSR HYDRO 2** will ensure vegetation management activities avoid or minimize impacts to riparian vegetation and other groundwater recharge areas. No Impact.

HYDRO 2 - Erosion and Sediment Control and Pollution Prevention

- **Plan the activity as necessary through project design, location, and timing to reduce potential water quality impacts.**

- **Avoid or minimize unacceptable impacts to riparian vegetation, groundwater recharge areas, steep slopes, highly erodible soils, or unstable areas by maintaining sufficient ground cover to encourage infiltration when possible and to filter pollutants.**
- **Prescribed fire containment lines shall be located and constructed to minimize erosion and prevent runoff from directly entering water bodies through construction and maintenance of suitable drainages features like water bars.**
- **Existing firebreaks (e.g. rock outcrops and roads) will be used instead of ground-disturbing fire containment lines to minimize the need for fire line construction in situations where artificial construction of fire lines could result in excessive erosion and sedimentation.**
- **Avoid placing fire lines through sensitive areas such as wetlands, marshes, prairies, and savannas unless absolutely necessary.**
- **Construct fire lines to be as narrow as necessary to halt the spread of the fire and place them to avoid impacts to water resources.**
- **Minimize clearing and scraping.**
- **In order to minimize high soil burn severity, weather and variables such as topography, soils and fuels will be incorporated into prescribed fire plans.**
- **Get cover on the site as soon as possible after the fire is out to maintain erosion control measures on fire lines.**
- **Install grades, ditches, and water bars if necessary to begin rehabilitation work.**
- **Install water bars on any fire line running up and down the slope, and direct runoff onto a filter strip or side slope, not into a drainage.**
- **If a prescribed fire becomes a high severity crown fire event, then immediate restoration efforts such as soil stabilization and replanting with native stock may be required.**
  Where possible, skid trails and temporary roads will be located on existing roads. If necessary, skid trails will not contain long, straight downhill segments, which would concentrate runoff. If a long straight downhill segment is necessary, skid trail rehabilitation measures will take place as soon as vegetation management activities are completed.

c) Vegetation management activities are anticipated to result in temporary increased sedimentation within areas of the state Park that overlap the Upper Calaveras watershed (HUC 8) and the Upper Stanislaus watershed (HUC 8). However, **PSR HYDRO 2** and site specific BMPs are anticipated to minimize these effects to the extent feasible. Additionally, vegetation management activities will not substantially alter the existing drainage pattern of the site or course of the river in a manner which would result in substantial on- or off-site erosion or siltation. On-site monitoring of activities will ensure corrective actions will be taken as needed. Due to these measures, the proposed action is not anticipated to degrade water quality and will result in a Less than Significant Impact.

d) Vegetation management activities will not substantially alter the existing drainage pattern of the site or area. Additionally, the project will not alter the course of the river or have a significant impact on- or off-site flooding. Please refer to **PSR HYDRO 2** regarding siltation and erosion. While project specific requirements may include regrading and restoring fire lines, these measures will result in a Less than Significant Impact with strict adherence to the project specific requirements listed at the end of this section.

e) The project would not create or contribute runoff water, which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff. Vegetation management activities will not increase impermeable surfaces (e.g. building footprint, expanded parking, new walkways) or contribute to additional runoff water. Additionally, implementation of **PSR HYDRO 2** will minimize runoff effects to the extent feasible resulting in a Less than Significant Impact.

f) This project has the potential to temporarily increase sediment-laden runoff as a result of vegetation management activities. However, **PSR HYDRO 1, PSR HYDRO 2** and site specific BMPs are anticipated to minimize these effects to the extent feasible ensure water quality impacts are temporary and Less than Significant.

g) Housing units or structures are not within the scope of this project. Housing units will not be placed in a 100-year flood hazard area as a result of this project. No Impact.

h) Vegetation management activities will not involve the placement of structures within flood flows or within any FEMA-designated 100-year floodplain. Therefore, this project will have No Impact on flood flows and will not impede or redirect them.

i) This scope of this project does not include levee or dam work. Vegetation management activities will not expose people or structures to an increased significant risk of loss, injury, or death from flooding, including flooding resulting from the failure of a levee or dam. No Impact.

j) In some cases, erosion could be considered natural, such as soil creep and runoff from steep slopes. However, past land practices have accelerated erosion along roads, trails and parking lot construction within the Park. Two landslide areas along the Parkways have been identified and will be considered for all vegetation management activities. However, **PSR GEO 2 and PSR HYDRO 2** and site specific BMPs are anticipated to minimize these effects to the extent feasible. On-site monitoring of management activities will ensure corrective actions will be taken as needed. Due to these measures, no mudflows or landslides are expected to occur as a result of vegetation management activities. Additionally, the project is not located in an area that will be severely inundated by either a seiche or a tsunami. No impact.

J. Land Use and Planning.

ENVIRONMENTAL SETTING

CBTSP is located in a rural, sparsely populated area of Calaveras and Tuolumne Counties approximately 3 miles northwest of the community of Arnold and 2.5 miles southwest of the community of Dorrington. State Route 4 traverses the northern edge of the park where this is a moderate level of ambient-level traffic noise. The majority of the park though is set away from any public roads consisting only of rugged forested terrain, surrounded by steep mountains. Most of the surrounding land; particularly around the Tuolumne County, side of the park is forested land, which is part of the Stanislaus National Forest.

Current use of park lands within the general vicinity of the project site include primarily passive recreational activities, such as hiking, picnicking, and observing nature. Adjacent non-park lands include the Stanislaus National Forest and isolated low-density residential development. The park is wholly owned and operated by California State Parks.

The area is zoned for recreation in Calaveras County and Public in Tuolumne County.

	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
WOULD THE PROJECT:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with the applicable land use plan, policy, or regulation of any agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

Criteria for Determining Significance

The analysis of determining the significance of impacts of the Proposed Action to Land Use and Planning is based on criteria **X** a-c, described in the environmental checklist above.

DISCUSSION

a) Adoption of the VMP and implementation of projects under the Plan will not divide an established community because none exists within the boundaries of CBTSP. No impact.

b) The VMP is consistent with Calaveras Big Trees SP's General Plan as well as all applicable state and local land use plans, policies, and regulations. The project is also in compliance with all conservation plans, policies, and ordinances that apply to the project and/or surrounding area. No impact.

b) There are no applicable HCP's or NCCP's associated with the project area. No impact.

K. Mineral Resources.

ENVIRONMENTAL SETTING

The Gold Rush of the mid 1800s provided the major attraction to Calaveras County and the rest of the Mother Lode. Since that time, mining has been a major component of the County's economy and livelihood. Between 1880 and 1962, the recorded value of minerals produced in Calaveras County amounted to over $200 million. Of that total, gold, limestone and copper accounted for the greatest amount. Although production figures are not available for the large quantities of gold that were mined before 1880, it is documented that the largest piece of gold found in the Western Hemisphere, weighing close to 150 pounds, was unearthed at Carson Hill on 22 November 1854. Other mineral extracted in quantity in the past include quartz crystal, copper, zinc, silver, lead, chromite, clay, sand, gravel and stone. At least twenty-six minerals have been produced commercially within the County. The history of mineral production suggests that much of Calaveras County has the potential for further mineral resource development (Calaveras County General Plan).

No significant mineral resources have been identified within the boundaries of Calaveras Big Trees State Park. Furthermore, CSP Resource Management Directives prohibits mineral resource extraction (Big Tree Creek Ford: Alignment and Elevation Restoration).

	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
WOULD THE PROJECT:				
a) Result in the loss of availability of a known mineral resource that is or would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒

DISCUSSION

a) Adoption of the VMP would not result in the loss of availability of a known mineral resource because no known mineral resources are known to exist within the park. No Impact.

b) Adoption of the VMP would not result in the loss of availability of a locally important mineral resource recovery site because none are known to exist within the park. No Impact.

L. Noise.

ENVIRONMENTAL SETTING

CBTSP is located in a rural, sparsely populated area of Calaveras and Tuolumne Counties approximately 3 miles northwest of the community of Arnold. State Route 4 traverses the northern edge of the park where this is a moderate level of ambient-level traffic noise. The majority of the park though is set away from any public roads consisting only of rugged forested terrain, surrounded by steep mountains. A few noise sensitive land uses (residential) are located southwest of the park and to the northeast side in the unincorporated community of Dorrington. Most of the surrounding land; particularly around the Tuolumne County, side of the park is forested land, which is part of the Stanislaus National Forest.

Vehicle traffic from SR 4, a two-lane State Highway, is the primary source of noise along with occasional air traffic consisting of small private planes and California Department of Forestry and Fire Protection (CDF) firefighting aircraft.

Noise is defined as unwanted sound and is known to have several adverse effects on people, including hearing loss, speech and sleep interference, physiological responses, and annoyance. Based on these known adverse effects of noise, the federal government, the State of California, and many local governments have established criteria to protect public health and safety and to prevent disruption of certain activities.

Noise is commonly described in "Ldn," that expresses average sound level over a 24-hour period in decibels (dB), the standard measure of pressure exerted by sound. Ldn includes a 10 dB penalty for sounds between 10 P.M. and 7 A.M., when background noise is lower and people are most sensitive to noise. Because decibels are logarithmic units of measure, a change of 3 decibels is hardly noticeable, while a change of 5 decibels is quite noticeable and an increase of 10 decibels is perceived as a doubling of the noise level. A change from 50dB to 60dB increases the percentage of the population that is highly annoyed at the noise source by about 7 percent, while an increase from 50 dB to 70 dB increases the annoyed population by about 25 percent. Sounds as faint as 10 decibels are barely audible, while noise over 120 decibels can be painful or damaging to hearing.

	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
WOULD THE PROJECT:				
a) Generate or expose people to noise levels in excess of standards established in a local general plan or noise ordinance, or in other applicable local, state, or federal standards?	☐	☐	☒	☐
b) Generate or expose people to excessive groundborne vibrations or groundborne noise levels?	☐	☐	☐	☒
c) Create a substantial permanent increase in ambient noise levels in the vicinity of the project (above levels without the project)?	☐	☐	☐	☒

d) Create a substantial temporary or periodic increase in ambient noise levels in the vicinity of the project, in excess of noise levels existing without the project?	☐	☐	☒	☐
e) Be located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport? If so, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) Be in the vicinity of a private airstrip? If so, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Criteria for Determining Significance

The analysis of determining the significance of impacts of the Proposed Action to Noise is based on criteria **XII** a-f, described in the environmental checklist above.

DISCUSSION

a) The VMP covers a range of activities at CBTSP. The Plan addresses several methods to manage vegetation, including prescribed fire; prescribed fire with pre-treatment thinning; pile burning with pre-treatment thinning; manual thinning with biomass removal; mechanical thinning with removal of large trees; and tree girdling.

Table 5 Construction Equipment Noise at 50 Feet

Equipment	Noise Level at 50 Feet
Equipment	**dB**
Stump Grinders	100
Mechanical masticator	75-80
Chipper	112-119
Chainsaws	110-120

Source: U.S. EPA 1971

Most activities occurring under the VMP however, are benign with respect to noise. Prescribed fire activities may require a dozer to blade fire lines but

b) No project carried out under the approved VMP would result in groundborne vibrations or higher groundborne noise levels. No impact.

c) Any noise resulting from management activities carried out under the plan will only be temporary in nature. The project will not create any source that would contribute to a substantial permanent increase in ambient noise levels near where certain management activities occur. No Impact.

d) Vegetation management activities carried out under the plan could result in temporary or periodic increases in ambient noise levels near the work that exceed the normal ambient noise levels. However, vegetation management activities have long been carried out in the park. Approval of the Vegetation Management Plan would represent a continuation of activities that generate noise and temporary increases in ambient noise are routine. As such, increases would be less than significant.

e, f) CBTSP is not within two miles of an airport or a private airstrip; therefore no impact.

M. Population and Housing

ENVIRONMENTAL SETTING

The park-wide project area contains employee housing and guest cabins. No housing developments are planned and none are planned to be removed. The communities surrounding the park are expansive rural subdivisions and small communities with a few small businesses, motels and service stations along the State Highway 4 corridor. Tourism does result in temporary seasonal fluctuations in the population of this area, but the project would not contribute to these variations.

WOULD THE PROJECT:	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

DISCUSSION

a - c) The project would not induce substantial population growth because it does not involve housing or new businesses. Vegetation management plan activities will not have any direct or indirect effect on population growth. Project activities will use temporary crews in addition to existing personnel, so additional housing will not be required. No housing or people will be displaced by project activities, which are in fact aimed at preventing possible future displacement by removing ladder fuels that aid in spreading wildfires. All project activities would take place within the confines of park boundaries, with no additions or changes to the existing local infrastructure. No Impact.

N. Public Services

ENVIRONMENTAL SETTING

Calaveras Big Trees SP maintains daily Ranger police protection year around with primary patrol in campgrounds and public use areas. Mutual aid coordination occurs with other local law enforcement agencies that have jurisdiction and maintain regular presence in the area (mainly the Calaveras County Sheriff and California Highway Patrol). The Ranger staff is informed each year as to the location, staffing, and type of projects being implemented in the park and vicinity.

Trails and fire roads provide generally easy access to these locations for recreation, project work, or in an emergency. Other areas within the Park are accessed by a network of service roads for use by fire suppression crews, Ranger patrol, and utility access to a few power lines traversing the park. These roads are periodically maintained to provide improved drainage and a hardened base, but are inaccessible in winter except on foot or snowmobile.

The California Department of Forestry provides fire protection for the area and maintains a fire station in Arnold. There is also a seasonal CDF station, located amidst vast commercial timberlands, about eight miles south of the Park at Skull Creek. The CDF Air Attack base is located in Columbia, approximately 20 miles from CBTSP. The Park is also within the response area of the Ebbetts Pass Fire District, which has a permanently staffed station in Arnold. No schools exist within the project area.

	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
WOULD THE PROJECT:				
a) Result in significant environmental impacts from construction associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:	☐	☐	☒	☐
Fire protection?	☐	☐	☒	☐
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

DISCUSSION

a) As noted in Chapter V above, the VMP includes the use of prescribed fire as well as pile burning. The goal of fuel treatment projects is to modify fire behavior to reduce environmental damage and aid in suppressing wildfires. Although wildland fires have occurred from losing control of prescribed burns, Cal Fire nevertheless recommends such fuel treatments as a means to prevent loss of lives and reduce fire suppression costs

resulting from devastating wildfire (Protection, 2012). With adherence to the outlined prescribed burn program will ensure that any impacts on local or State Fire Protection services will be less than significant.

as noted in the Environmental Setting above, Calaveras Big Trees SP maintains daily Ranger police protection year-round, with primary patrols in campgrounds and public use areas. State Park Rangers have full law enforcement authority and only require assistance from local Sheriff as backup for unusual situations. No additional demands on Rangers or local law enforcement staff are expected as a result of this project.

No schools exist within or near the project area. No changes would occur that would affect existing schools or require additional schools or school personnel. As no public use areas would be permanently closed nor access significantly limited as a result of this project, no other parks in the area should show a related increase in use.

No adverse impact would occur at CBTSP or any other public facilities as a result of this project. The project, as a whole, would have a Less than Significant effect on any public services.

O. Recreation.

ENVIRONMENTAL SETTING

Calaveras Big Trees State Park is one of the most visited units of the California State Park System, logging over 200,000 visitor-days each year. Visitor activities include hiking, camping, fishing, swimming, birding, and other forms of nature study. In addition, cross-country skiing and snowshoeing are pursued in the winter.

Facilities available to the public include three campgrounds (129 family campsites and a group site), five backcountry campsites, four picnic areas (150 picnic sites), four main trails (over 15 miles total), a campfire center, numerous outdoor interpretive displays, and a visitor center/museum. These facilities are most heavily used during the vacation season from Memorial Day through Labor Day, but use continues throughout the entire year. Although most of the Park is closed to vehicles during the winter months due to snow, the heavy use access area around the North Grove is kept open, and winter camping is allowed in 12 sites.

	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
WOULD THE PROJECT:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities, such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☐	☒

DISCUSSION

a) Vegetation management activities will not contribute to an increase in the use of existing neighborhood and regional parks or other recreational facilities in general, much less to a point that accelerates substantial physical deterioration to any facility. No Impact.

b) This project does not include the construction of recreational facilities or the expansion of any facility. No Impact.

P. Transportation/Traffic.

ENVIRONMENTAL SETTING

Traffic circulation at Calaveras Big Trees SP is generally confined to two main corridors traversing the park. State Highway 4 is the main regional traffic corridor providing access to the Park, with traffic volumes of few-hundred vehicles per hour throughout much of the summer. The location of the Park's controlled public vehicle entrance (where visitors must stop to pay Park fees) is a short distance off the Highway, where the W.W. Smith Parkway begins. The Parkway is the route providing the public vehicle access to remote developed areas of the Park. All park backcountry roads are not open to visitors' vehicles, but serve as patrol roads, emergency access, and limited multi-purpose trails.

	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
WOULD THE PROJECT:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system?	☐	☐	☐	☒
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Cause a change in air traffic patterns, including either an increase in traffic levels or a change in location, that results in substantial safety risks?	☐	☐	☐	☒
d) Contain a design feature (e.g., sharp curves or a dangerous intersection) or incompatible uses (e.g., farm equipment) that would substantially increase hazards?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Result in inadequate parking capacity?	☐	☐	☐	☒
g) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒

DISCUSSION

a) The proposed project would not cause an increase in traffic or exceed a level of service due to vegetation management activities over current conditions. Traffic levels due to vegetation management activities in the project area will remain the same whether or not the proposed VMP is approved. Because no change is foreseeable, there would be no foreseeable impact.

b) No Impact: The project is in a remote area of a nature preserve and will not impact traffic congestion management.

c) The project sites are not located within an airport land use plan, within two miles of a public airport, in the vicinity of a private air strip, and do not serve as a normal reporting point for air traffic in the area. Nothing in the proposed VMP would in any way affect or change existing air traffic patterns; therefore, no impact would occur as a result of this project.

d) The VMP does not contain any changes in existing roadways, nor proposes any new road features. Therefore, no impact would result.

e) The project would not result in inadequate emergency access because the alternative route to areas beyond the temporary closure requires only a few hundred yards of additional driving. This impact to emergency access is less than significant; the work would not disrupt normal emergency access to any other portion of the Park.

f) The project would not result in inadequate parking capacity because the North Grove Campground does not fill to capacity during the months scheduled for project construction. Park staff and construction workers will park in service areas or in closed areas at the work site. Adequate parking exists in the nearby campground and day use areas that will not be altered or used by construction crews. The project is also not expected to have a measurable effect on total visitation to the park. No impact.

g) The project would not conflict with adopted policies, plans, or programs supporting alternative transportation because it does not reduce or increase transportation uses. No impact.

Q. Utilities And Service Systems.

ENVIRONMENTAL SETTING

Calaveras Big Trees SP is serviced by several public utilities but provides its own wastewater disposal system. Surface water is supplied to the project area by precipitation, runoff during storm events, and snowmelt; potable water is supplied by the Calaveras County Water District. Electricity for the Park is provided by Pacific Gas and Electric Company, propane gas is delivered to various-sized domestic tanks by any one of several local mobile distribution companies, and commercial telecommunications are provided by ATT. A local waste management company provides solid waste disposal services.

	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
WOULD THE PROJECT:				
a) Exceed wastewater treatment restrictions or standards of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities?	☐ Yes	☒ No		
Would the construction of these facilities cause significant environmental effects?	☐	☐	☐	☐
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities?	☐ Yes	☒ No		
Would the construction of these facilities cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources or are new or expanded entitlements needed?	☐	☐	☒	☐
e) Result in a determination, by the wastewater treatment provider that serves or may serve the project, that it has adequate capacity to service the project's anticipated demand, in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations as they relate to solid waste?	☐	☐	☐	☒

DISCUSSION

a, b) Adoption of the VMP would not affect wastewater would be produced by this project. No Impact.

c) The VMP would not require or result in the construction of new stormwater drainage facilities or expansion of existing facilities. No Impact.

d) No new water entitlements would be required for vegetation management projects undertaken pursuant to the plan. Less than Significant Impact.

e, g) No wastewater or solid waste will be generated by this project. No Impact.

e) Approval of the VMP would not result in an increase in generation of solid waste. No impact.

XV. MANDATORY FINDINGS OF SIGNIFICANCE

	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
WOULD THE PROJECT:				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal?	☐	☐	☒	☐
b) Have the potential to eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒	☐
c) Have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means the incremental effects of a project are considerable when viewed in connection with the effects of past projects, other current projects, and probably future projects?)	☐	☐	☒	☐
d) Have environmental effects that will cause substantial adverse effects on humans, either directly or indirectly?	☐	☐	☒	☐

DISCUSSION

a) The VMP consists of a menu of actions that will be available at CBTSP to restore the ecological processes that naturally manage the Park's vegetative communities and maintain the ecological balance. Therefore, implementation of the VMP will not substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plants or animals. Less than significant impact.

b) As noted in the Cultural Resources Section above, implementation of a project under the VMP will have project requirements to insure that any project undertaken pursuant to the plan will not have the potential to eliminate important examples of the major periods of California history or prehistory. Less than significant impact.

c) The Central Valley District conducts vegetation management activities on an ongoing basis. Projects undertaken pursuant to the VMP will be similar to vegetation management activities that have long occurred. The implementation of subsequent management projects are evaluated to assure that they will not result in significant adverse cumulative

effects on the environment. The incremental effects of the project are insignificant when viewed in connection with the effects of past projects, other current projects, and probable future projects. Impacts from environmental issues addressed in this evaluation do not overlap with additional planned projects in such a way as to result in cumulative adverse impacts that are greater than the sum of the parts. This project will result in a less than significant impact.

d)

All of the environmental effects have been determined to pose a less than significant impact on humans. Potential impacts on vegetation management activities undertaken under the VMP would be reduced to a less than significant level if all appropriate project requirements are fully integrated into those projects.

XVI. REFERENCES

Ager, A.A., McMahan, A., Hayes, J.L., Smith, E.L., 2007. Modeling the effects of thinning on bark beetle impacts and wildfire potential in the Blue Mountains of eastern Oregon. Landscape and Urban Planning 80, 301–311.

Albini, F.A. 1976. Estimating wildfire behavior and effects. U.S.D.A. Forest Service, Intermountain Forest and Range Experiment Station, Ogden, Utah, General Technical Report INT-30, 88 p.

Allen, B.H., 2005. Sierran Mixed Conifer; California Wildlife Habitat Relationships System. California Department of Fish and Game, California Interagency Wildlife Task Group.

Allen, D.C.; Macalady, A.K.; Chenchouni, H.; Bachelet, D.; McDowell, N.; Vennetier, M.; Kizberger, T.; Rigling, A.; Breshears, D.D.; Hogg, E.H. A global overview of drought and heat-induced tree mortality reveals emerging climate risks for forests. For. Ecol. Manag. 2010, 259, 660–684.

Anderson, M.K. 1996. Tending the wilderness. Restoration Management Notes. 14(2):154–166.

Bentz, B.J., Régnière, J., Fettig, C.J., Hansen, E.M., Hayes, J.L., Hicke, J.A., Kelsey, R.G., Negrón, J.F., Seybold, S.J., 2010. Climate change and bark beetles of the western United States and Canada: direct and indirect effects. BioScience 60, 602–613.

Bigler, C., Gavin, D.G., Gunning, C., Veblen, T.T., 2007. Drought induces lagged tree mortality in a subalpine forest in the Rocky Mountains. Oikos 116, 1983–1994.

Bond, M.L., Lee, D.E., Bradley, C.M., Hanson, C.T., 2009. Influence of pre-fire tree mortality on fire severity in conifer forests of the San Bernardino Mountains, California. The Open Forest Science Journal 2, 41–47.

Bonnicksen, T. W. and E. C. Stone 1982. Reconstruction of a Presettlement Giant Sequoia-Mixed Conifer Forest Community Using the Aggregation Approach. Ecology 63:1134–1148.

Boynton, R. Accessed July 2015. http://ice.ucdavis.edu/project/landscape_management_unit_lmu_tool. Information Center for the Environment (ICE) – University of California, Davis.

Boynton, R. 2011. Landscape Management Unit, Quick Start Guide. Information Center for the Environment (ICE) – University of California, Davis.

Brown, J.K. 1974. Handbook for inventorying downed woody fuel. USDA Forest Service General Technical Report INT-16. Intermountain Forest and Range Experiment Station. Ogden Utah.

California State Parks (CSP). 2007. Representative Keystone Watersheds: A guidance tool to help prioritize natural resource management actions and highlight healthy watersheds throughout the State Park System. Natural Resources Division.

Carroll, A.L.; Shore, T.L.; Safranyik, L. Direct Control: Theory and Practice. In The Mountain Pine Beetle: A Synthesis of Biology, Management, and Impact on Lodgepole Pine; Natural Resources Canada, Canadian Forest Service, Pacific Forestry Centre: Victoria, BC, Canada, 2006; pp. 155–172.

Demetry, A. 1995. Regeneration patterns within canopy gaps in a giant sequoia-mixed conifer forest: Implications for forest restoration. M.S. Thesis. Northern Arizona University, Flagstaff.

Demetry, A. and D. M. Duriscoe. 1996. Fire-caused canopy gaps as a model for the ecological restoration of Giant Forest Village: report to National Park Service, Sequoia and Kings Canyon National Parks. Denver: Denver Service Center Technical Information Center, National Park Service.

DPR 1984. Calaveras Big Trees State Park Cultural Resource Inventory. In unit files.

DPR 1989. Calaveras Big Trees State Park General Plan. In unit files.

Evagelista, P.H.; Kumar, S.; Stohlgren, T.J.; Young, N.E. Assessing forest vulnerability and the potential distribution of pine beetles under current and future climate scenarios in the interior West of the US. For. Ecol. Manag. 2011, 262, 307–316.

Farguhar, F.P. 1925. Exploration of the Sierra Nevada. California Historical Society Quarterly.4(1) 3-58.

Finan, Mark. "Monsoon Question." Message to the author. 17 Oct. 2015. E-mail.

Foster, D.G. 1980. Cuyamaca Rancho State Park, East Mesa Prescribed Burn Program: Cultural Resource Inventory. Preliminary Report Number 2. Manuscript on file. California Department of Parks and Recreation, Sacramento, CA.

Hessburg P, Salter R, James K (2007) Re-examining fire severity relations in pre-management era mixed conifer forests: inferences from landscape patterns of forest structure. Landscape Ecology 22:5–24

Hicke, J.A., Johnson, M.C., Hayes, J.L. and Preisler, H.K., 2012. Effects of bark beetle-caused tree mortality on wildfire. Forest Ecology and Management, 271, pp.81-90.

Hunter, M.L., 1999. Maintaining biodiversity in forest ecosystems. Cambridge university press.

Knapp, P.A.; Soule, P.T.; Maxwell, J.T. Mountain pine beetle selectivity in old-growth ponderosa pine forests, Montana, USA. Ecol. Evol. 2012, 3, 1141–1148.

Kosco, B. H., and J. W. Bartolome. 1983. Effects of cattle and deer on regenerating mixed conifer clearcuts. J. Range Manage. 36:265-268.

Kulakowski, D., Jarvis, D., 2011. The influence of mountain pine beetle outbreaks and drought on severe wildfires in northwestern Colorado and southern Wyoming: a look at the past century. Forest Ecology and Management 262, 1686–1696.

Long, J.W., Quinn-Davidson, L., and C.N. Skinner. 2014. Science Synthesis to Support Socioecological Resilience in the Sierra Nevada and Southern Cascade Range. U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. General Technical Report PSW-GTR-247.

Luers AL, Cayan DR, Franco G, Hanemann M, Croes B. 2006. Our changing climate: assessing the risks to California. Summary report from the California Climate Change Center, CEC-500-2006-077.

Marcot, B. G., ed. 1979. Introduction Vol. I. California wildlife/habitat relationships program north coast/ cascades zone. U.S. Dep. Agric., For. Serv., Six Rivers Nat'l. Forest, Eureka, Calif.

McKelvey, K.S., Skinner, C.N., Chang, C., Erman, D.C., Husari, S.J., Parsons, D.J., van Wagtendonk, J.W., and Weatherspoon, P.C. 1996. An Overview of Fire in the Sierra Nevada. Sierra Nevada Ecosystem Project: Final Report to Congress, Vol II. Centers for Water and Wildland Resources. University of California, Davis. pp. 1033-1040.

Nelson, T.; Boots, B.; White, K.J.; Smith, A.C. The impact of treatment on mountain pine beetle infestation rates. Br. Columbia J. Ecosyst. Manag. 2006, 7, 20–36.

North, M. 2012. Managing Sierra Nevada Forests. U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. General Technical Report PSW-GTR-237

North, M., Innes, J., and Harold, Z. 2007. Comparison of thinning and prescribed fire restoration treatments to Sierran mixed-conifer historic conditions. Can. J. For. Res. 37:331-342.

North, N., Stine, P., O'Hara, K., Zielinski, W., and Stephens, S. 2009. An Ecosystem Management Strategy for Sierran Mixed-Conifer Forests. U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. General Technical Report PSW-GTR-220.

North, M., Stine, P., Zielinski, W., O'Hara, K. and Stephens, S., 2010. Harnessing fire for wildlife. The Wildlife Professional, 4, pp.30-33.

Piirto, D.D., and Rogers, R.R. 1999. An Ecological Foundation for Management of National Forest Giant Sequoia Ecosystems. U.S. Department of Agriculture, Forest Service, Pacific Southwest Region. R5-EM-TP-005.

Raffa, K.F.; Aukema, B.H.; Bentz, B.J.; Carroll, A.L.; Hicke, J.A.; Turner, M.G.; Romme, W.H. Cross-Scale drivers of natural disturbances prone to anthropogenic amplification: The dynamics of bark beetle eruptions. BioScience 2008, 58, 501–517.

Rundel, Philip W.. 1971. “Community Structure and Stability in the Giant Sequoia Groves of the Sierra Nevada, California”. *American Midland Naturalist* 85 (2). The University of Notre Dame: 478–92. doi:10.2307/2423770.

Safranyik, L.; Carroll, A. The Biology and Epidemiology of the Mountain Pine Beetle in Lodgepole Pine Forests. In The Mountain Pine Beetle: A Synthesis of Biology, Management, and Impacts on Lodgepole Pine; Canadian Forest Service: Victoria, BC, Canada, 2007; pp. 3–66.

Sands, A., ed. 1977. Riparian forests in California, their ecology and conservation. Univ.of California, Davis, Inst. Of Ecol. Publ. No. 15.

Scott, J. H. and R. E. Burgan 2005. Standard fire behavior fuel models: a comprehensive set for use with Rothermel’s surface fire spread model. Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 72 p.

Shaw, D. 2012. Fuels Reduction and Understory Burning, Burton Creek State Park, D.L. Bliss State Park, Ed Z’berg-Sugar Pine Point State Park, Emerald Bay State Park, Tahoe State Recreation Area, and Ward Creek Unit. California State Parks. Draft Report.

Six, D.L., Biber, E. and Long, E., 2014. Management for mountain pine beetle outbreak suppression: Does relevant science support current policy?. *Forests*, *5*(1), pp.103-133.

Stephens, S. L. and M. A. Finney. 2002. Prescribed fire mortality of Sierra Nevada mixed conifer treespecies: effects of crown damage and forest floor combustion. Forest Ecology and Management 162: 261–271.

Stephenson, N.L., 1999. Reference conditions for giant sequoia forest restoration: structure, process, and precision. Ecol. Appl. 9:1253-1265.

Stephens, S. L., and D. L. Elliott-Fisk. 1998. *Sequoiadendron giganteum*–mixed conifer foreststructure in 1900–1901 from the southern Sierra Nevada, CA. Madroño 45:221–230.

Swetnam, T. W. and C. H. Baisan. 2003. Tree-ring reconstructions of fire and climate history in the Sierra Nevada and Southwestern United States. Pages 158-195. In: T. T. Veblen, W. Baker, G. Montenegro, and **T. W. Swetnam,** editors. Fire and Climatic Change in Temperate Ecosystems of the Western Americas. Ecological Studies Vol. 160. Springer, New York.

Swetnam, T. W. 1993. Fire history and climate change in giant sequoia groves. Science 262: 885–89.

Taylor AH, Skinner CN (2004) Spatial patterns and controls on historical fire regimes and forest structure in the Klamath Mountains. Ecological Applications 13:704–719

Thomas, J. W., tech ed. 1979. Wildlife habitats in managed forests in the Blue Mountains of Oregon and Washington. U.S. Dept. of Agric., For. Serv. Handbook No. 553.

Turner, M.G., Romme, W.H., Gardner, R.H., 1999. Prefire heterogeneity, fire severity, and early postfire plant reestablishment in subalpine forests of Yellowstone National Park, Wyoming. International Journal of Wildland Fire 9, 21–36.

Underwood, E.C., Viers, J.H., Quinn, J.F., and North, M. 2010. Using Topography to Meet Wildlife and Fuels Treatment Objectives in Fire-Suppressed Landscapes. Environmental Management 46:809-819.

USDA Forest Service. Revised 1993. Protocol for surveying for spotted owls in proposed management activity areas and habitat conservation areas. U.S. Department of Agriculture, Forest Service.

USDA Forest Service. 2010. California Forest Insect and Disease Training Manual. US Forest Service, Region 5. http://caforestpestcouncil.org/wp-content/uploads/2008/06/Insect-and-Disease-Training-Manual.pdf. P.25-32.

USDI Fish and Wildlife Service. Revised 2012. Protocol for surveying proposed management activities that may impact northern spotted owls. U.S. Fish and Wildlife Service, Portland, OR.

Van Wagtendonk et al 1998. Fuel Bed Characteristics of Sierra Nevada Conifers. Western Journal of Applied Forestry 13(3):73-84.

Verner, J., and A. S. Boss tech. coords. 1980. California wildlife and their habitats: western Sierra Nevada. U.S. Dep. Agric. For. Serv. (Berkeley, Calif.), Gen. Tech.Rep. PSW-37.

West, D.R., 2010. Mountain pine beetle-caused lodgepole pine mortality from the 1980's and subsequent fire occurrence in Colorado. M.S. Colorado State University, Fort Collins, CO.

Whittaker, R.H. 1975. Communities and Ecosystems. 2nd Edition. Macmillan Publishing Co., Inc., New York, 385 p.

Woodbridge, B., and Hargis, C.D., 2006. Northern Goshawk Inventory and Monitoring Technical Guide. U.S. Department of Agriculture, Forest Service. Gen Tech Report WO-71.

York, R. A., Fuchs, D., Battles, J. J. and Stephens, S. L., Radial growth responses to gap creation in large, old *Sequoiadendron giganteum*. Applied Vegetation Science. 13(4): 498-509.

CEQA REFERENCES

Air Quality

Air Resources Board. (2016, May 5). *Area Designations Maps / State and National*. Retrieved from California Environmental Protection Agency - Air Resources Board: https://www.arb.ca.gov/desig/adm/adm.htmAir Quality

Air Resources Board. (2016, September 7). *Federal Standard Area Designations.* Retrieved from California Environmental Protection Agency: https://www.arb.ca.gov/desig/feddesig.htm

Air Resources Board. (2016, May 5). *State Area Designations Definitions*. Retrieved from California Environmental Protection Agency - Air Resources Board: https://www.arb.ca.gov/desig/adm/define.htm

Air Resources Board. (n.d.). *California Map for Local Air Distirct Websites*. Retrieved from California Environmental Protection Agency - air Reosurces Board: https://www.arb.ca.gov/capcoa/dismap.htm

ARB. (2014, March 14). *California Air Basin Map*. Retrieved from California Environmental Protection Agency - Air Resources Board: https://www.arb.ca.gov/ei/maps/statemap/abmap.htm

Calaveras County Air Pollution Control. (2017). *Air Pollution Control*. Retrieved from Calaveras County: http://envhmgmt.calaverasgov.us/AirPollutionControl.aspx

EPA. (n.d.). NAAQS Designations Process. Retrieved from United States Environmental Protection Agency: https://www.epa.gov/criteria-air-pollutants/naaqs-designations-process

Huey, G. (2017). *Airborne measurements of western U.S. wildfire emissions: Comparison with prescribed burning and air quality implications*. Retrieved from Journal of Geophysical Research: http://onlinelibrary.wiley.com/doi/10.1002/2016JD026315/full

United States Senate. (2004, February 24). *Clean Air Act.* Retrieved from U.S. Environmental Protection Agency: https://www.epw.senate.gov/envlaws/cleanair.pdf

Biological Resources

Arroyo-Cabrales, J. & Álvarez-Castañeda, S.T. 2008. *Corynorhinus townsendii*. The IUCN Red List of Threatened Species 2008: e.T17598A7161467. Website http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T17598A7161467.en. [Accessed 2017].

Calflora. 2017. Information on California plants for education, research and conservation, with data contributed by public and private institutions and individuals, including the Consortium of California Herbaria. Berkeley, California: Website: http://www.calflora.org/ [Accessed 2017].

California Department of Fish and Wildlife (CDFW). 2017a. Vegetation Classification and Mapping Program (VegCAMP), Natural Communities. Website: https://www.wildlife.ca.gov/Data/VegCAMP/Natural-Communities. [Accessed 2017].

_____. 2017b. Rare Find: California Department of Fish and Game Natural Diversity Database (CNDDB). Website: Version 5 [Accessed 2017].

_____. 2017c. Bald Eagles in California. Website: https://www.wildlife.ca.gov/Conservation/Birds/Bald-Eagle. [Accessed 2017].

CNPS, Rare Plant Program. 2017. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website http://www.rareplants.cnps.org [Accessed 2017].

Cornell Lab of Ornithology.. 2017a. All About Birds: Northern Goshawk. Website: https://www.allaboutbirds.org/guide/Northern_Goshawk/id [Accessed 2017].

_____.. 2016b. All About Birds: Willow Flycatcher. Website: https://www.allaboutbirds.org/guide/Willow_Flycatcher/id [Accessed 2017].

Department of Parks and Recreation (DPR). 1989. Calaveras Big Trees State Park General Plan.

Harvey, H. Thomas, Howard S. Shellhammer, and Ronald E. Stecker. 1980. Giant Sequoia Ecology, Fire and Reproduction. Scientific Monograph Series No. 12. U.S. Department of the Interior, National Park Service, Washington, D.C.

North, N., Stine, P., O'Hara, K., Zielinski, W., and Stephens, S. 2009. An Ecosystem Management Strategy for Sierran Mixed-Conifer Forests. U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. General Technical Report PSW-GTR-220.

Small, A. 1994. California Birds: Their Status and Distribution. Ibis Publishing. Co., Vista, CA. 342 pp.

Squires, John R., and Richard T. Reynolds. 1997. Northern Goshawk (Accipiter gentilis). In The Birds of North America, No. 298 (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, PA, and the American Ornithologists' Union, Washington, D.C.

Stephenson, Nathan L. 1996. Ecology and Management of Giant Sequoia Groves. Sierra Nevada Ecosystem Project: Final report to Congress, Vol. II, Assessments and scientific basis for management options. Davis: University of California, Centers for Water and Wildland Resources.

The Gymnosperm Database. 2017a. Taxus brevifolia Nuttall 1849. Website: http://www.conifers.org/ta/Taxus_brevifolia.php. [Accessed 2017].

_____. 2017b. Pinus ponderosa, Douglas ex Lawson 1836. Website: http://www.conifers.org/pi/Pinus_ponderosa.php. [Accessed 2017].

_____. 2017c. Pinus lambertiana, Douglas 1827. Website: http://www.conifers.org/pi/Pinus_lambertiana.php. [Accessed 2017].

U.S. Department of Agriculture, Natural Resources Conservation Service (USDA NRCS). 2017. Website: https://plants.usda.gov/plantguide/pdf/cs_quke.pdf. [Accessed 2017].

U.S. Fish and Wildlife Service (USFWS). 2012. Protocol For Surveying Proposed Management Activities That May Impact Northern Spotted Owls.

U.S. Fish and Wildlife Service (USFWS). 2017a. Sacramento Fish & Wildlife Office: Sierra Nevada Yellow-legged Frog: Website: https://www.fws.gov/sacramento/es_species/Accounts/Amphibians-Reptiles/es_sn-yellow-legged-frog.htm [Accessed 2017].

_____. 2017b. Sacramento Fish & Wildlife Office: California Tiger Salamander. Website: https://www.fws.gov/sacramento/es_species/Accounts/Amphibians-Reptiles/es_ca-tiger-salamander.htm. [Accessed 2017].

Walfoort, G.D. and L.M. Hunt. 1982. Resource Inventory Report, Calaveras Big Trees State Park. State of California, Department of Parks and Recreation.

Western Bat Working Group (WBWG). 2017. Website: http://www.wbwg.org. (Accessed 2017).

Wikipedia. 2017a. Rhododendron occidentale. Website: https://en.wikipedia.org/wiki/Rhododendron_occidentale. [Accessed 2017].

Wikipedia. 2017b. Great grey owl. Website: https://www.fws.gov/arcata/es/amphibians/crlf/crlf.html [Accessed 2017].

Woodbridge, Brian and Christina D. Hargis. 2006. Northern Goshawk Inventory and Monitoring Technical Guide, Gen. Tech. Report WO-71. U.S. Department of Agriculture, Forest Service.

Zeiner, D.C., W.F. Laudenslayer Jr., K.E. Mayer, and M. White, eds. 1990a. California's Wildlife, Vol II Birds. State of California, The Resources Agency, Department of Fish and Game. Sacramento, CA.

Zeiner, David C., William F. Laudenslayer, Kenneth E. Mayer, and Marshall White. 1990b. California's Wildlife – Volume III – Mammals. California Department of Fish and Game. Sacramento, CA. 407 pp.

Cultural Resources

Department of Parks and Recreation (DPR) 1986. Calaveras Big Tree State Park, Inventory of Features-Cultural Resources. On file at California Department of Parks and Recreation, Sacramento, CA.

Department of Parks and Recreation (DPR) 1990. Calaveras Big Trees State Park General Plan. On file at California Department of Parks and Recreation, Sacramento, CA.

Department of Parks and Recreation (DPR) 2016. Vegetation Management Plan Calaveras Big Trees State Park. On file at California Department of Parks and Recreation, Sacramento, CA.

Engbeck, Joseph H. Jr. 2002. By the People, For the People: The Work of the Civilian Conservation Corps in California State Parks, 1933-1941, California Department of Parks and Recreation, Sacramento, CA.

Farquhar, Francis P. 1965 History of the Sierra Nevada. University of California Press. Berkeley and Los Angeles.

Gruver, Dionne 2006. Calaveras Big Tree State Park Jack Knight Hall Restroom and Miscellaneous ADA Site Improvements Archaeological Survey Report. On file at California Department of Parks and Recreation, Sacramento, CA.

Hughes, Richard E., and Randall Milliken. 2007. Prehistoric Material Conveyance. In California

Prehistory: Colonization, Culture, and Complexity, edited by Terry L. Jones and Kathryn A. Klar, pp, 259-271. Lanham, Maryland: AltaMira Press.

Jones, Terry L., and Kathryn A. Klar 2007. Colonization, Culture, and Complexity. In California Prehistory: Colonization, Culture, and Complexity, edited by Terry L. Jones and Kathryn A. Klar, pp, 299-315. Lanham, Maryland: AltaMira Press.

Levy, Richard 1978 Eastern Miwok. In California, edited by Robert F. Heizer, pp 398-413. Handbook of North American Indians Vol. 8, William G. Sturtevant, general editor. Washington, D.C.: Smithsonian Institution.

Roland, Carol (Final Assessments) 2003. Park Rustic Buildings and Structures in California State Parks System: Survey and Evaluation, Manuscript on file at California Department of Parks and Recreation, Sacramento.

Rosenthal, Jeffery S., Gregory G. White, and Mark Q. Sutton 2007. The Central Valley: A View from Catbird's Seat. In California Prehistory: Colonization, Culture, and Complexity, edited by Terry L. Jones and Kathryn A. Klar, pp. 147-163. Lanham, Maryland: AltaMira Press.

Geology and Soils

Bryant, C. W. (2010). *California Geological Survey Fault Activity Map of California.* Sacramento: California Geological Survey.

Conservation, C. D. (1990). *Mineral Land Classification of Nevada County, California .* Sacramento: California Department of Conservation Division of Mines and Geology.

D. Branum, R. C. (2016). *Earthquake Shaking Potential for California.* Sacramento: California Geological Survey.

Leivas, E. (1983). *Geology of Calaveras Big Trees State Park.* Sacramento: California Division of Mines and Geology (now California Geological Survey) Open File Report 84-5, prepared for the California Department of Parks and Recration.

USDA. (2016). *Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties and Stanislaus National Forest, California, Parts.* Natural Resources Conservation Service.

Greenhouse Gas Emissions

AEP. (2007). *Alternative Approaches to Analyzing Greenhouse Gas Emissions and Global Climate Change in CEQA Documents.* Sacramento: AEP Association of Environmental Professionals.

California Environmental Protection Agency. (2017, June 6). *California 1990 Greenhouse Gas Emissions Level and 2020 Limit*. Retrieved from California Environmental Protection Agency - Air Resources Board: https://www.arb.ca.gov/cc/inventory/1990level/1990level.htm

CSP. (2008). Cool Parks. Retrieved April 17, 2015, from California State Parks: http://www.parks.ca.gov/?page_id=24872

Hazards and Hazardous Materials

AirNav.com. (n.d.). *016 Garberville Airport*. Retrieved April 18, 2015, from AirNav.com: https://www.airnav.com/airport/O16

AirNav.com. (2017, May 25). *Columbia Airport*. Retrieved from AirNav.com: http://www.airnav.com/airport/O22

CalFire. (2007, November). *Fire Hazard Severity Zones in SRA-Calaveras County.* Retrieved from CalFire Wildland Hazard & Building Code: http://frap.fire.ca.gov/webdata/maps/calaveras/fhszs_map.5.pdf

California Department of Toxic Substances Control. (n.d.). *EnviroStor Database*. Retrieved from California Department of Toxic Substances Control: https://www.envirostor.dtsc.ca.gov/public/mapfull.asp?global_id=&x=-119&y=37&zl=18&ms=640,480&mt=m&findaddress=True&city=calaveras%20big%20trees%20state%20park&zip=&county=&federal_superfund=true&state_response=true&vol

untary_cleanup=true&school_cleanup=t

Fire, C. (2012). *Environmental Protection Program.* Retrieved from Cal Fire: http://www.calfire.ca.gov/resource_mgt/resource_mgt_EPRP_FuelsTreatment

Protection, California Department of Forestry and Fire. (2012). Environmental Protection Program. Retrieved from CalFire: http://www.calfire.ca.gov/resource_mgt/resource_mgt_EPRP_FuelsTreatment

Hydrology and Water Quality

CSP, C. S. (2004, September). Department of Parks and Recreation Operations Manual . Sacramento, California: California State Parks.

CSP, C. S. (2007). *Representative Keystone Watersheds: A guidance tool to help prioritize natural resource management actions and highlight healthy watersheds throughout the State Park System.* Natural Resource Division.

CVRWQCB, C. R. (2016). *The Water Quality Contorl Plan (Basin Plan) for the California Regional Water Quality Control Board Central Valley Region.* Central Valley Regional Water Quality Contorl Board.

DWR, C. D. (2015, 6 16). *Stanislaus River NF A Calaveras Big Trees*. Retrieved from EPA STORET Central Warehouse: https://ofmpub.epa.gov/storpubl/storet_wme_pkg.Display_Station

NOAA. (2016). *Global Summary of the Month for 2016 for Calaveras Big Trees, CA US USC00041277.* Asheville: National Oceanic & Atmospheric Administration.

NRCS. (2017). *USDA Geospatial Data Gateway.* USDA.

.

THIS PAGE INTENTIONALLY LEFT BLANK

XVII. INITIAL STUDY REPORT PREPARATION

CALIFORNIA DEPARTMENT OF PARKS AND RECREATION

Northern Service Center

Monica Aleman
Joel Bonilla
Dionne Gruver
Michael Jasinski
Roy W. Martin
Brad Michalk
Dan Osanna

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX A

NOTICE OF AVAILABILITY AND INTENT

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

NOTICE OF AVAILABILITY AND INTENT TO ADOPT AN INITIAL STUDY/NEGATIVE DECLARATION FOR THE PROPOSED VEGETATION MANAGEMENT PLAN PROJECT

Date: February 22, 2018

To: Interested Parties

The California Department of Parks and Recreation (DPR) has directed the preparation of and intends to adopt a Negative Declaration for the proposed project, in compliance with the California Environmental Quality Act (CEQA) and State CEQA Guidelines. DPR is the lead agency for the proposed project under CEQA.

PROJECT LOCATION: Calaveras Big Trees State Park, Calaveras & Tuolumne Counties

DESCRIPTION OF THE PROPOSED PROJECT: The Vegetation Management Plan addresses the management of vegetative resources at Calaveras Big Trees State Park (CBTSP). A long-term vegetation management plan helps to ensure continuity of actions toward mutually accepted management goals and objectives over time. The Sierra Nevada Conservancy an agency of the State of California provided funding for this plan.

PUBLIC REVIEW PERIOD: The Initial Study/Negative Declaration is being circulated for public review and comment for a period of 30 days, beginning February 22, 2018. Questions regarding the project should be directed to Heather M Reith at 22708 Broadway Street, Columbia, CA 95310 or by email at Heather.Reith@parks.ca.gov.

Your views and comments on this project are welcomed. Written comments should be submitted no later than March 29, 2018, to the following address:

California State Parks
Northern Service Center
One Capitol Mall, Suite 410
Sacramento, CA 95814

Copies of the Initial Study/Negative Declaration may be reviewed at the following locations during normal business hours:

California Department of Parks & Recreation
Central Valley District Headquarters
California State Parks
22708 Broadway Street
Columbia, CA 95310

Calaveras County Library-Arnold Branch
1065 Blagen Rd
Arnold, CA 95223

NOTICE OF PUBLICATION: This notice was published in the Union Democrat on February ___, 2017.

APPENDIX B

GIANT SEQUOIA MANAGEMENT: RECRUITMENT AND CAVITIES

A. Giant Sequoia Management: Recruitment and Cavities (S. Bakken, CSP Forester).

1. GS Recruitment

It has been noted in Coast Redwood that only one successful new coast redwood individual per acre per 50 years is necessary to perpetuate a redwood dominated forest. This is because coast redwoods live for almost 2000 years and as a forest, are relatively stable. Giant sequoia can live twice as long as Coast Redwood and is one of the most wind-firm species on the planet. So we can conclude that the relative lack of giant sequoia natural regeneration is not as serious a problem as one would first believe.

Nevertheless, CA State Parks managers have not been intentionally planning to regenerate the species or indeed expand the range of Giant Sequoia in the face of global climate change pressures. I believe that it is time for the department to intentionally manage to encourage giant sequoia natural regeneration within Calaveras North and South Groves and also to expand the occurrence of GS within new acquisitions of property associated with CBTSP such as the Big Tree National Forest acquisition; this property already has a few scattered old growth GS.

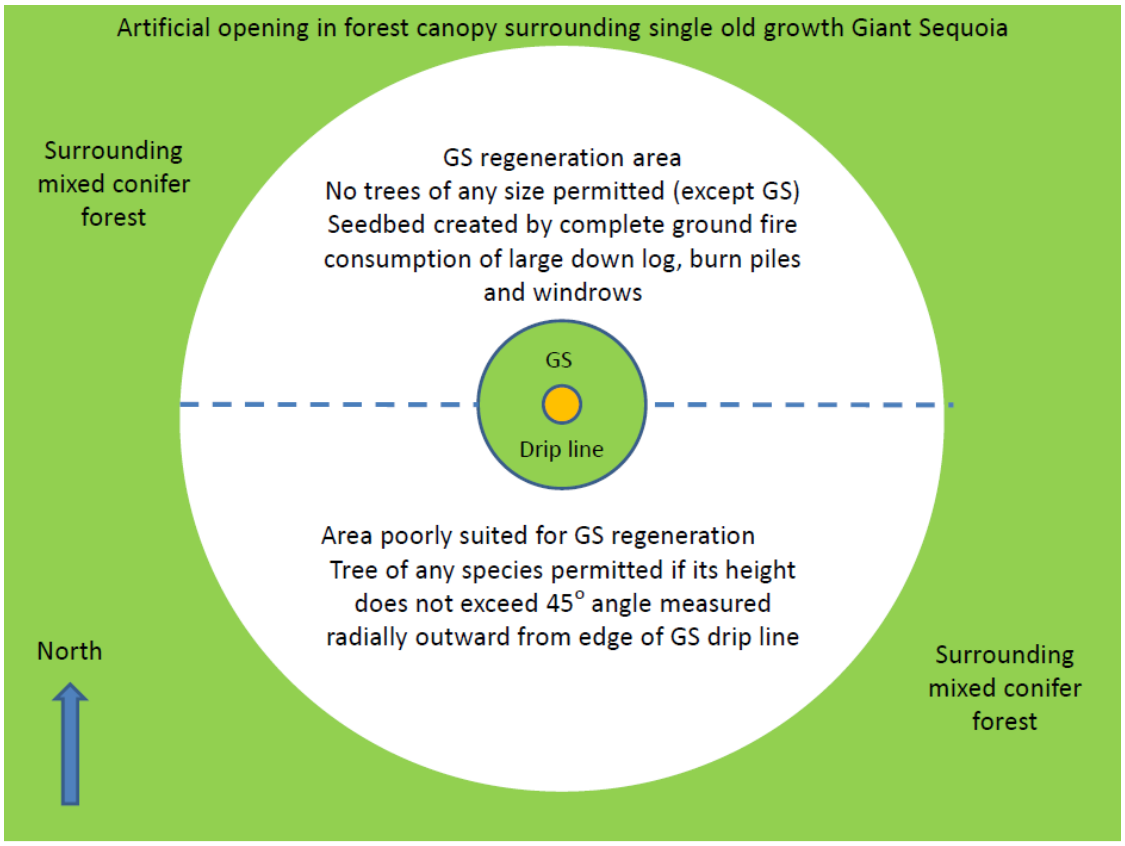
Giant sequoia requires three very specific microsite conditions for germination and survival of new individuals:

1. GS seedlings require a mineral soil seed bed to successfully germinate, preferably a seed bed that has been sterilized by a very long residence ground fire (total consumption of large woody material).

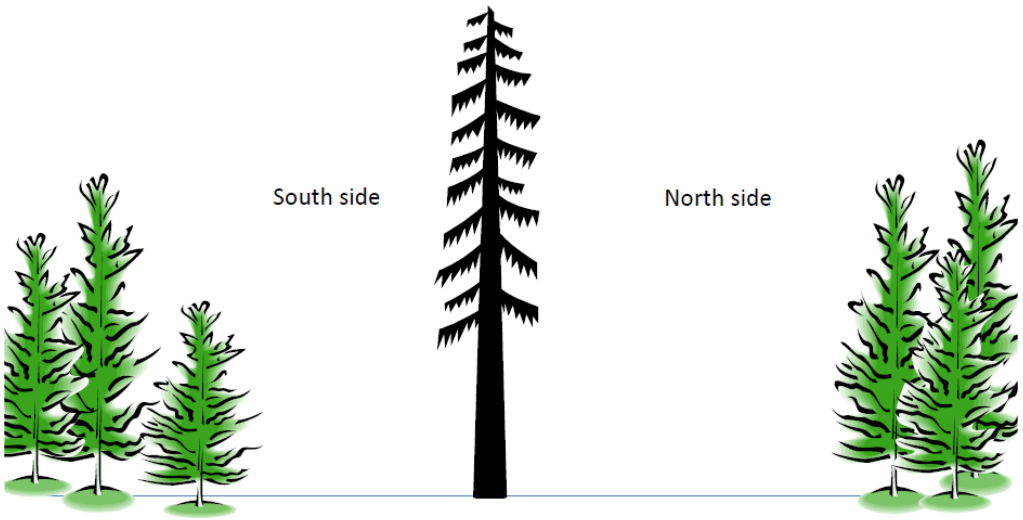
2. Newly established GS seedlings need unobstructed sunlight for several hours per day throughout the growing season for decades. GS is one the fastest growing species on the planet and can out-compete its associated conifers for height growth provided it has sufficient sunlight. Create large custom openings around old growth GS that are devoid of competing conifers at the time of GS germination. After, GS germination, the natural establishment of competing conifers is not important due to GS's superior height growth.

3. While old growth GS is extremely wind-firm, it does lose very large pieces of its canopy (tops and branches). Any GS seedlings, saplings and pole sized individuals within the old growth GS drip line may experience a life ending crushing blow.

To assure the continued existence of the giant sequoia groves, only 1-2 seedlings for each mature giant sequoia need to survive to old growth trees.

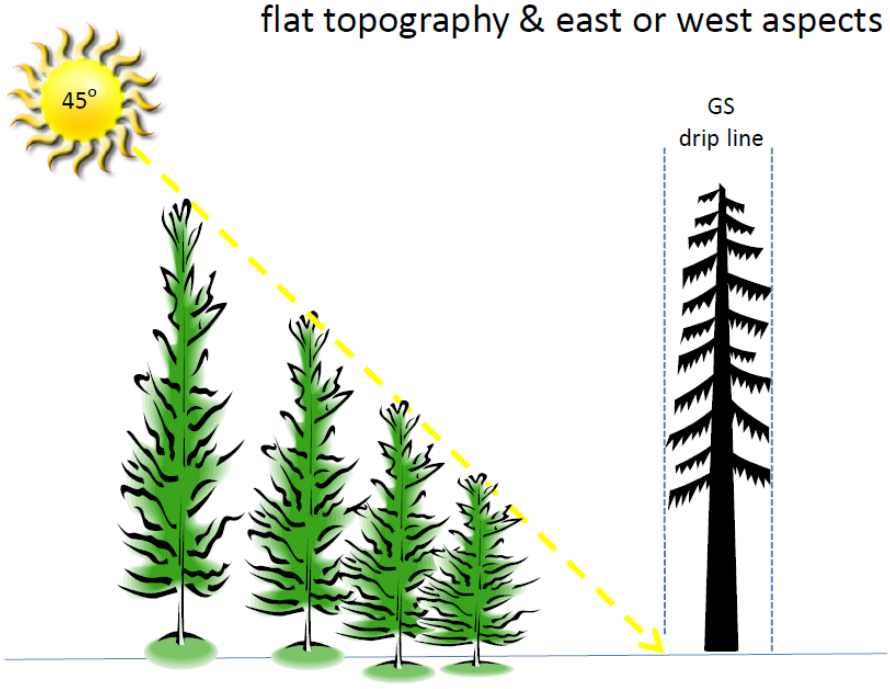

Artificial opening in forest canopy surrounding single old growth Giant Sequoia
Surrounding mixed conifer forest
GS regeneration area
No trees of any size permitted (except GS)
Seedbed created by complete ground fire consumption of large down log, burn piles and windrows
GS
Drip line
Area poorly suited for GS regeneration
Tree of any species permitted if its height does not exceed 45° angle measured radially outward from edge of GS drip line
North
Surrounding mixed conifer forest

Proposal: Clear around 1 old growth GS per 100 acres per year



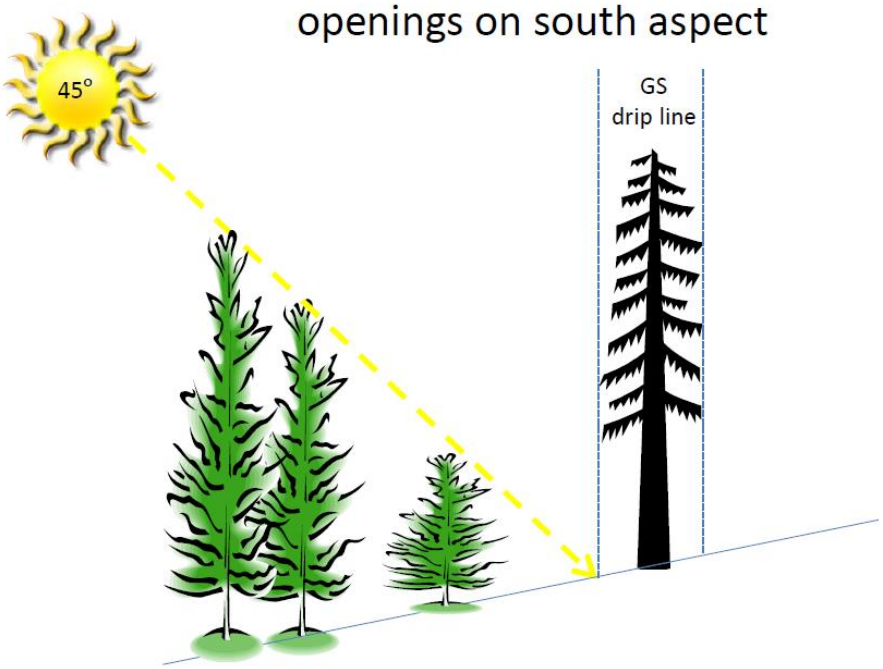
Noon sun angle exceeds 43° from Mar 21 through Sept 21

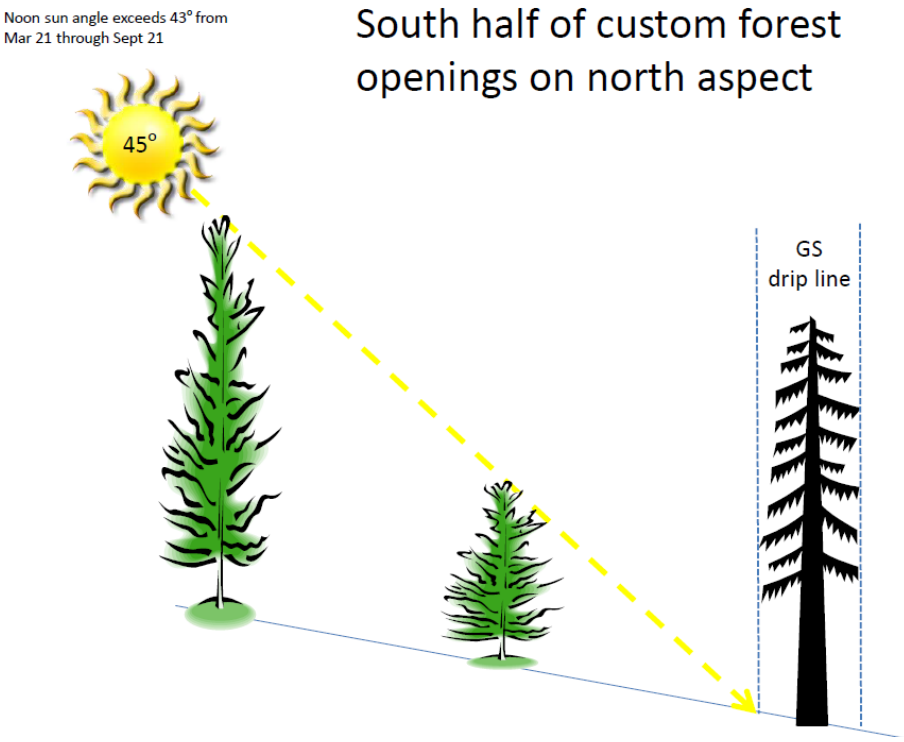
South half of custom forest openings on flat topography & east or west aspects



Noon sun angle exceeds 43° from Mar 21 through Sept 21

South half of custom forest openings on south aspect



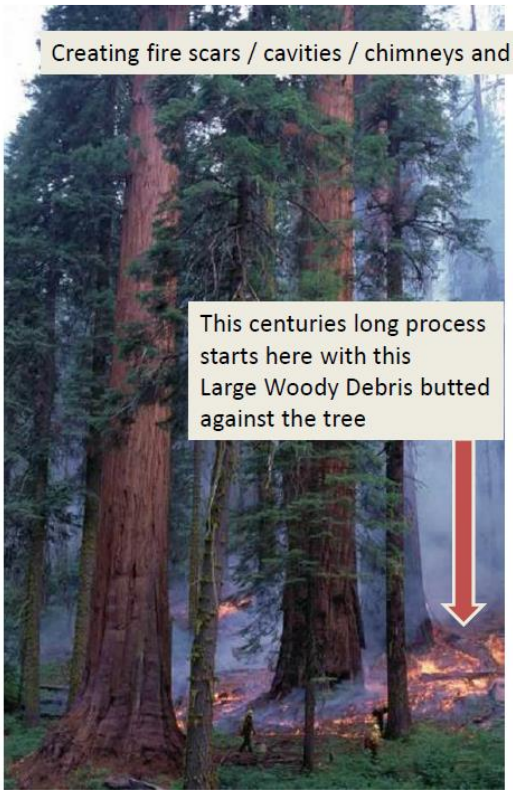


2. Cavity Creation

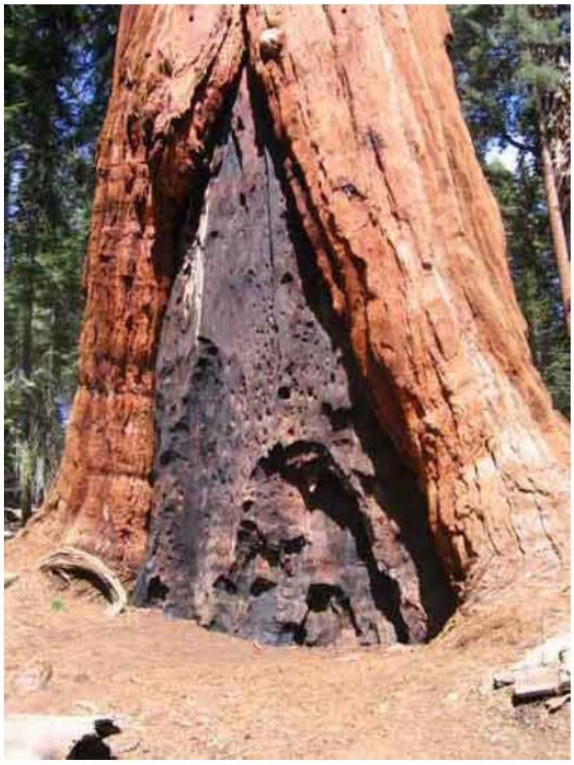
Basal cavities are a natural component in old growth conifer forests especially giant sequoia groves. These cavities are created when ground fuel (fallen branches or trees) becomes stacked against the base of a mature tree. Wildfire would then kill a

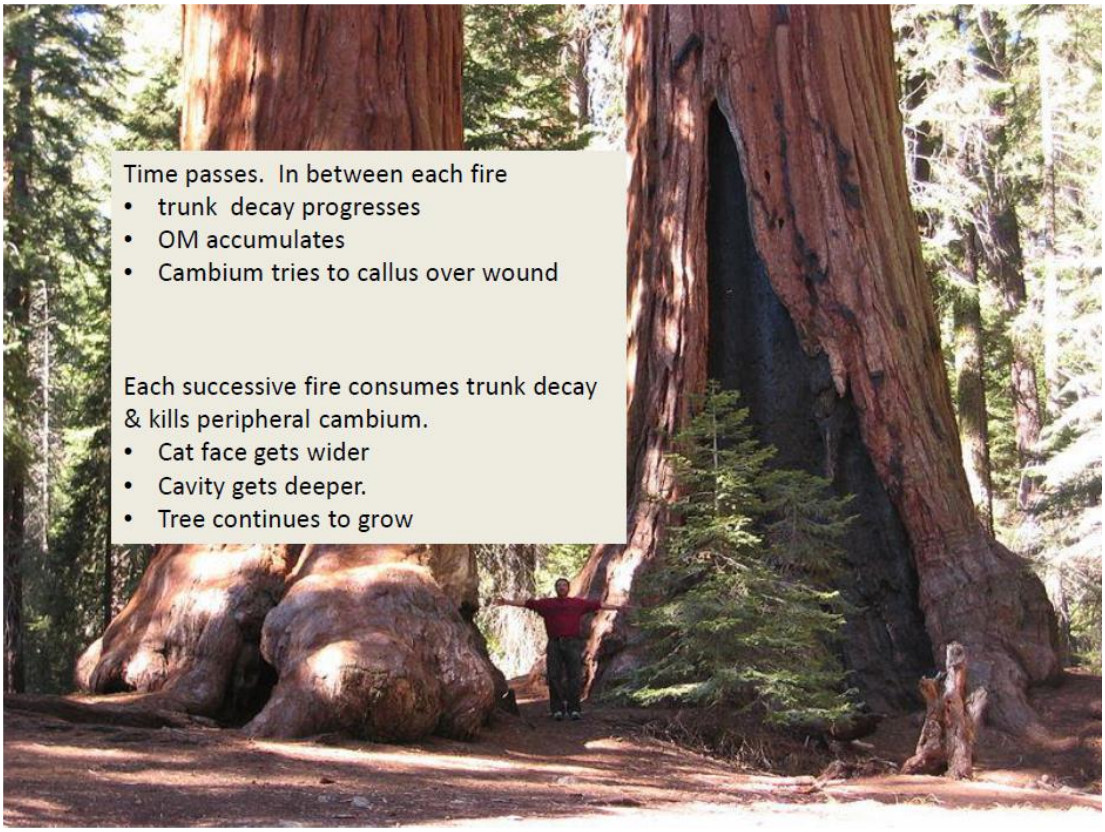
section of the trunk cambium. Decay begins and more organic matter (fuel) builds up. Successive fires expand the cavity.

These cavities are important wildlife habitat for birds, bats and other small mammals. However, fire suppression has ceased this process and during prescribed burns, fuel is often removed away from the trunk of large trees for protection. When planning for a prescribed burn, project managers should consider this process. If there is a natural accumulation of fuel against an old growth tree within the burn unit, or if the cavity process has begun, then managers should allow the fuel to remain and burn in place to begin or continue the cavity process.



Trunk decay begins.
Organic Matter accumulates





Time passes. In between each fire
- trunk decay progresses
- OM accumulates
- Cambium tries to callus over wound

Each successive fire consumes trunk decay & kills peripheral cambium.
- Cat face gets wider
- Cavity gets deeper.
- Tree continues to grow

APPENDIX C

SENSITIVE SPECIES LIST

CALIFORNIA DEPARTMENT OF FISH and WILDLIFE **RareFind**

Query Summary:
Quad IS (Boards Crossing (3812032) OR Garnet Hill (3812043) OR Calaveras Dome (3812042) OR Tamarack (3812041) OR Liberty Hill (3812031) OR Crandall Peak (3812022) OR Strawberry (3812021) OR Stanislaus (3812023))

Print Close

CNDDB Element Query Results

Scientific Name	Common Name	Taxonomic Group	Element Code	Total Occs	Returned Occs	Federal Status	State Status	Global Rank	State Rank	CA Rare Plant Rank	Other Status	Habitats
Accipiter gentilis	northern goshawk	Birds	ABNKC12060	432	13	None	None	G5	S3	null	BLM_S-Sensitive, CDF_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFS_S-Sensitive	North coast coniferous forest, Subalpine coniferous forest, Upper montane coniferous forest
Accipiter striatus	sharp-shinned hawk	Birds	ABNKC12020	22	1	None	None	G5	S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Cismontane woodland, Lower montane coniferous forest, Riparian forest, Riparian woodland
Allium tribracteatum	three-bracted onion	Monocots	PMLIL022D0	35	24	None	None	G2	S2	1B.2	USFS_S-Sensitive	Chaparral, Lower montane coniferous forest, Upper montane coniferous forest
Ambystoma macrodactylum sigillatum	southern long-toed salamander	Amphibians	AAAAA01085	603	15	None	None	G5T4	S3	null	CDFW_SSC-Species of Special Concern	null
Big Tree Forest	Big Tree Forest	Forest	CTT84250CA	68	1	None	None	G3	S3.2	null	null	Lower montane coniferous forest
Bombus crotchii	Crotch bumble bee	Insects	IIHYM24480	233	1	None	None	G3G4	S1S2	null	null	null
Botrychium crenulatum	scalloped moonwort	Ferns	PPOPH010L0	98	7	None	None	G4	S3	2B.2	USFS_S-Sensitive	Bog & fen, Lower montane coniferous forest, Marsh & swamp, Meadow & seep, Upper montane coniferous forest, Wetland
Botrychium minganense	Mingan moonwort	Ferns	PPOPH010R0	115	6	None	None	G4G5	S3	2B.2	USFS_S-Sensitive	Bog & fen, Lower montane coniferous forest, Meadow & seep, Upper montane coniferous forest, Wetland
Botrychium montanum	western goblin	Ferns	PPOPH010K0	54	2	None	None	G3	S2	2B.1	USFS_S-Sensitive	Lower montane coniferous forest, Meadow & seep, Oldgrowth, Upper montane coniferous forest
Calochortus clavatus var. avius	Pleasant Valley mariposa-lily	Monocots	PMLIL0D095	131	1	None	None	G4T2	S2	1B.2	BLM_S-Sensitive, USFS_S-Sensitive	Lower montane coniferous forest
Clarkia australis	Small's southern clarkia	Dicots	PDONA05040	61	18	None	None	G2	S2	1B.2	BLM_S-Sensitive, USFS_S-Sensitive	Cismontane woodland, Lower montane coniferous forest
Corynorhinus	Townsend's	Mammals	AMACC08010	626	2	None	None	G3G4	S2	null	BLM_S-	Broadleaved

townsendii	big-eared bat										Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFS_S-Sensitive, WBWG_H-High Priority	upland forest, Chaparral, Chenopod scrub, Great Basin grassland, Great Basin scrub, Joshua tree woodland, Lower montane coniferous forest, Meadow & seep, Mojavean desert scrub, Riparian forest, Riparian woodland, Sonoran desert scrub, Sonoran thorn woodland, Upper montane coniferous forest, Valley & foothill grassland
Diplacus pulchellus	yellow-lip pansy monkeyflower	Dicots	PDSCR1B280	69	11	None	None	G2	S2	1B.2	BLM_S-Sensitive, USFS_S-Sensitive	Lower montane coniferous forest, Meadow & seep
Emys marmorata	western pond turtle	Reptiles	ARAAD02030	1249	1	None	None	G3G4	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_VU-Vulnerable, USFS_S-Sensitive	Aquatic, Artificial flowing waters, Klamath/North coast flowing waters, Klamath/North coast standing waters, Marsh & swamp, Sacramento/San Joaquin flowing waters, Sacramento/San Joaquin standing waters, South coast flowing waters, South coast standing waters, Wetland
Erythronium tuolumnense	Tuolumne fawn lily	Monocots	PMLIL0U0H0	35	4	None	None	G2G3	S2S3	1B.2	BLM_S-Sensitive, SB_RSABG-Rancho Santa Ana Botanic Garden, USFS_S-Sensitive	Broadleaved upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest
Euderma maculatum	spotted bat	Mammals	AMACC07010	68	2	None	None	G4	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, WBWG_H-High Priority	null
Falco peregrinus anatum	American peregrine falcon	Birds	ABNKD06071	55	1	Delisted	Delisted	G4T4	S3S4	null	CDF_S-Sensitive, CDFW_FP-Fully Protected, USFWS_BCC-Birds of Conservation Concern	null
Gulo gulo	California wolverine	Mammals	AMAJF03010	174	2	Proposed Threatened	Threatened	G4	S1	null	CDFW_FP-Fully Protected, IUCN_NT-Near Threatened, USFS_S-Sensitive	Alpine, Alpine dwarf scrub, Meadow & seep, Montane dwarf scrub, North coast coniferous forest, Riparian forest, Subalpine coniferous forest, Upper montane coniferous forest, Wetland
Haliaeetus	bald eagle	Birds	ABNKC10010	327	1	Delisted	Endangered	G5	S3	null	BLM_S-	Lower montane

leucocephalus											Sensitive, CDF_S-Sensitive, CDFW_FP-Fully Protected, IUCN_LC-Least Concern, USFS_S-Sensitive, USFWS_BCC-Birds of Conservation Concern	coniferous forest, Oldgrowth
Horkelia parryi	Parry's horkelia	Dicots	PDROS0W0C0	44	1	None	None	G2	S2	1B.2	BLM_S-Sensitive, USFS_S-Sensitive	Chaparral, Cismontane woodland, Ione formation
Lepus americanus tahoensis	Sierra Nevada snowshoe hare	Mammals	AMAEB03012	15	1	None	None	G5T3T4Q	S2	null	CDFW_SSC-Species of Special Concern	Riparian woodland
Lomatium stebbinsii	Stebbins' lomatium	Dicots	PDAPI1B1V0	84	45	None	None	G2	S2	1B.1	USFS_S-Sensitive	Chaparral, Lower montane coniferous forest
Margaritifera falcata	western pearlshell	Mollusks	IMBIV27020	76	1	None	None	G4G5	S1S2	null	null	Aquatic
Martes caurina sierrae	Sierra marten	Mammals	AMAJF01014	149	2	None	None	G5T3	S3	null	USFS_S-Sensitive	null
Orthotrichum holzingeri	Holzinger's orthotrichum moss	Bryophytes	NBMUS560E0	7	1	None	None	G3	S2	1B.3	null	Cismontane woodland, Lower montane coniferous forest, Pinon & juniper woodlands, Upper montane coniferous forest
Pandion haliaetus	osprey	Birds	ABNKC01010	501	1	None	None	G5	S4	null	CDF_S-Sensitive, CDFW_WL-Watch List, IUCN_LC-Least Concern	Riparian forest
Pekania pennanti	fisher - West Coast DPS	Mammals	AMAJF01021	736	3	Proposed Threatened	Candidate Threatened	G5T2T3Q	S2S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, USFS_S-Sensitive	North coast coniferous forest, Oldgrowth, Riparian forest
Peltigera gowardii	western waterfan lichen	Lichens	NLVER00460	26	2	None	None	G3G4	S3	4.2	USFS_S-Sensitive	Riparian forest
Rana boylii	foothill yellow-legged frog	Amphibians	AAABH01050	1140	3	None	Candidate Threatened	G3	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_NT-Near Threatened, USFS_S-Sensitive	Aquatic, Chaparral, Cismontane woodland, Coastal scrub, Klamath/North coast flowing waters, Lower montane coniferous forest, Meadow & seep, Riparian forest, Riparian woodland, Sacramento/San Joaquin flowing waters
Rana sierrae	Sierra Nevada yellow-legged frog	Amphibians	AAABH01340	665	7	Endangered	Threatened	G1	S1	null	CDFW_WL-Watch List, IUCN_EN-Endangered, USFS_S-Sensitive	Aquatic
Strix nebulosa	great gray owl	Birds	ABNSB12040	78	1	None	Endangered	G5	S1	null	CDF_S-Sensitive, IUCN_LC-Least Concern, USFS_S-Sensitive	Lower montane coniferous forest, Oldgrowth, Subalpine coniferous forest, Upper

												montane coniferous forest

APPENDIX D

TREE MORTALITY STATE OF EMERGENCY

NOW, THEREFORE, I, EDMUND G. BROWN JR., Governor of the State of California, in accordance with the authority vested in me by the State Constitution and statutes, including the California Emergency Services Act, and in particular, section 8625 of the California Government Code, **HEREBY PROCLAIM A STATE OF EMERGENCY** to exist within the State of California.

IT IS HEREBY ORDERED THAT:

1. The Department of Forestry and Fire Protection, the California Natural Resources Agency, the California Department of Transportation, and the California Energy Commission shall immediately identify areas of the State that represent high hazard zones for wildfire and falling trees using best available science and geospatial data.

2. State agencies, utilities, and local governments to the extent required by their existing responsibilities to protect the public health and safety, shall undertake efforts to remove dead or dying trees in these high hazard zones that threaten power lines, roads and other evacuation corridors, critical community infrastructure, and other existing structures. Incidental vegetation such as shrubs that restrict access for safe and efficient removal of the dead and dying trees also may be removed. The Department of Forestry and Fire Protection shall issue emergency guidelines setting forth the relevant criteria, and the California Conservation Corps shall assist government entities in implementing this directive to the extent feasible.

3. The Department of Forestry and Fire Protection shall identify potential storage locations for removed trees across impacted areas in partnership with federal agencies and local jurisdictions.

4. The California Department of Transportation shall formally request immediate assistance through the Federal Highway Administration's Emergency Relief Program, Title 23, United States Code section 125, in order to obtain federal assistance for removal of dead and dying trees that are adjacent to highways.

5. The Department of General Services will identify state facilities, and the California Department of Transportation shall identify highway and road corridors, where woodchips produced from dead trees can be used as mulch.

6. The Governor's Office of Emergency Services and the Department of Forestry and Fire Protection shall work with impacted counties to distribute portable equipment across high hazard zones so that isolated communities can remove and process wood waste locally where appropriate.

7. The California Air Resources Board and the California Department of Forestry and Fire Protection shall work together and with federal land managers and the United States Environmental Protection Agency to expand the practice of prescribed burns, which reduce fire risk and avoid significant pollution from major wildfires, and increase the number of allowable days on a temporary basis to burn tree waste that has been removed in high hazard areas.

8. The California Public Utilities Commission shall utilize its authority to extend contracts on existing forest bioenergy facilities receiving feedstock from high hazard zones.

9. The California Public Utilities Commission shall take expedited action to ensure that contracts for new forest bioenergy facilities that receive feedstock from high hazard zones can be executed within six months, including initiation of a targeted renewable auction mechanism and consideration of adjustments to the BioMat Program defined pursuant to Public Utilities Code section 399.20. No later than six months after the BioMat program begins, the California Public Utilities Commission shall evaluate the need for revisions to the program to facilitate contracts for forest bioenergy facilities.

10. The California Public Utilities Commission shall prioritize facilitation of interconnection agreements for forest bioenergy facilities in high hazard zones, and shall order the use of expedited mediation or other alternative dispute resolution processes when conflicts delay development of projects.

11. The California Energy Commission shall prioritize grant funding from the Electric Program Investment Charge for woody biomass-to-energy technology development and deployment, consistent with direction from the California Public Utilities Commission.

12. The California Department of Forestry and Fire Protection, the California Energy Commission, and other appropriate agencies shall work with land managers to estimate biomass feedstock availability, storage locations, and volumes that may be available for use as bioenergy feedstock at existing and new facilities.

13. The California Department of Forestry and Fire Protection and the California Energy Commission shall work with bioenergy facilities that accept forest biomass from high hazards zones to identify potential funds to help offset higher feedstock costs.

14. The California Department of Resources Recycling and Recovery and the California Department of Forestry and Fire Protection will work with affected counties and existing wood product markets to determine the feasibility for expanded wood product markets in California.

15. For purposes of carrying out directives 1, 2, and 5 through 8, Division 13 (commencing with section 21000) of the Public Resources Code and regulations adopted pursuant to that Division are hereby suspended. This suspension applies to any actions taken by state agencies, and for actions taken by local agencies where the state agency with primary responsibility for implementing the directive concurs that local action is required, as well as for any necessary permits or approvals required to complete these actions.

16. In order to ensure that equipment and services necessary for emergency response can be procured quickly, the provisions of the Government Code and the Public Contract Code applicable to state contracts, including, but not limited to, advertising and competitive bidding requirements, are hereby suspended as necessary to carry out this Proclamation. Approval by the Department of Finance is required prior to the execution of any contract entered into pursuant to these directives.

17. For purposes of this Proclamation, Chapter 3.5 (commencing with section 11340) of Part 1 of Division 3 of the Government Code is suspended for the development and adoption of regulations or guidelines needed to carry out the provisions in this Order. Any entity issuing regulations or guidelines pursuant to this directive shall conduct a public meeting on the regulations and guidelines prior to adopting them.

18. The Office of Emergency Services shall provide local government assistance as appropriate under the authority of the California Disaster Assistance Act, California Government Code section 8680 et seq. and California Code of Regulations, title 19, section 2900 et seq.

19. State agencies shall actively monitor tree removal efforts directed by this Proclamation to assess their effectiveness in protecting forest health and strengthening forest resilience.

This Proclamation is not intended to, and does not, create any rights or benefits, substantive or procedural, enforceable at law or in equity, against the State of California, its agencies, departments, entities, officers, employees, or any other person.

I FURTHER DIRECT that as soon as hereafter possible, this proclamation be filed in the Office of the Secretary of State and that widespread publicity and notice be given of this proclamation.

IN WITNESS WHEREOF I have hereunto set my hand and caused the Great Seal of the State of California to be affixed this 30th day of October 2015.

Edmund G. Brown Jr.

EDMUND G. BROWN JR.
Governor of California

ATTEST:

ALEX PADILLA
Secretary of State