## Appendix B - Full Application Checklist

SNC Reference#: _____

Project Name: Big Tree Creek Watershed Forest Restoration

Applicant: Heather M. Reith, California Department of Parks and Recreation

Please mark each box: check if item is included in the application; mark "N/A" if not applicable to the project. "N/A" identifications must be explained in the application. Please consult with SNC staff prior to submission if you have any questions about the applicability to your project of any items on the checklist. All applications must include a CD including an electronic file of each checklist item, if applicable. The naming convention for each electronic file is listed after each item on the checklist. (Electronic File Name = EFN: "naming convention". file extension choices)

Submission requirements for all Category One and Category Two Grant Applications

1. ☑ Completed Application Checklist *(EFN: Checklist.doc,.docx,.or .pdf)*
2. ☑ Table of Contents *(EFN: TOC.doc,.docx, or .pdf)*
3. ☑ Full Application Project Information Form *(EFN: SIform.doc, .docx, or .pdf)*
4. ☑ CCC/Local Conservation Corps Document *(EFN: CCC.pdf)*
5. ☑ Authorization to Apply or Resolution *(EFN: authorization.doc, .docx, or .pdf)*
6. ☑ Narrative Descriptions *(EFN: Narrative.doc or .docx)*
   a. ☑ Detailed Project Description (5,000 character maximum for section 5a only)
      - ☑ Project Description including Goals/Results, Scope of Work, Location, Purpose, etc.
   b. ☑ Workplan and Schedule
   c. ☑ Restrictions, Technical/Environmental Documents and Agreements
      - ☐ Restrictions / Agreements *(EFN: RestAgree.pdf)*
      - ☐ Regulatory Requirements / Permits *(EFN: RegPermit.pdf)*
   d. ☑ Organizational Capacity
   e. ☑ Cooperation and Community Support
      - ☐ Letters of Support *(EFN: LOS.pdf)*
   f. ☑ Tribal Support Narrative *(EFN: tribal.doc, docx)*
   g. ☑ Long Term Management and Sustainability
      - ☑ Long-Term Management Plan *(EFN: LTMP.pdf)*
   h. ☑ Performance Measures
7. Budget documents
   a. ☑ Detailed Budget Form (EFN: Budget.xls, .xlsx)
8. Supplementary Documents
   a. Environmental Documentation
      - ☑ California Environmental Quality Act (CEQA) documentation *(EFN: CEQA.pdf)*
      - ☐ National Environmental Policy Act (NEPA) documentation *(EFN: NEPA.pdf)*
   b. Maps and Photos
      - ☑ Project Location Map *(EFN: LocMap.pdf)*
      - ☑ Parcel Map showing County Assessor's Parcel Number(s) *(EFN: ParcelMap.pdf)*

- ☑ Topographic Map *(EFN: Topo.pdf)*
- ☑ Photos of the Project Site *(10 maximum) (EFN: Photo.jpg, .gif)*

c. Additional submission requirements <u>for Fee Title Acquisition applications only</u>
- ☐ Acquisition Schedule *(EFN: acqSched.doc,.docx or .pdf)*
- ☐ Willing Seller Letter *(EFN: WillSell.pdf)*
- ☐ Real Estate Appraisal *(EFN: Appraisal.pdf)*

d. Additional submission requirements <u>for Site Improvement / Restoration Project applications only</u>
- ☐ Land Tenure Documents *(EFN: Tenure.pdf)*
- ☑ Site Plan *(EFN: SitePlan.pdf)*
- ☐ Leases or Agreements *(EFN: LeaseAgmnt.pdf)*

I certify that the information contained in the Application, including required attachments, is accurate, and that I have been authorized to apply for this grant.

Heather M Reith — 8/31/15

Signed *(Authorized Representative)* — Date

Heather M. Reith, Sr. Environmental Scientist

Name and Title *(print or type)*

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**SIERRA NEVADA CONSERVANCY**
**PROPOSITION 1 – Watershed Improvement Program Project Information Form**

**SNC REFERENCE #**

**PROJECT NAME** Big Tree Creek Watershed Forest Restoration

**APPLICANT NAME** *(Legal name, address, and zip code)*

Heather M. Reith
22708 Broadway Street
Columbia, CA 95310

**AMOUNT OF GRANT REQUEST** $500,000.00

**TOTAL PROJECT COST** $500,000.00

**PROJECT LOCATION** *(County with approx. lat/long, center of project area)*

Calaveras County, -120.293892 / 38.285645

| **SENATE DISTRICT NUMBER** | **ASSEMBLY DISTRICT NUMBER** |
|---|---|
| 8 | 5 |

**PERSON WITH MANAGEMENT RESPONSIBILITY FOR GRANT CONTRACT**

| *Name and title* | *Phone* | *Email Address* |
|---|---|---|
| ☐ Mr. ☒ Ms. Heather M. Reith | 209-536-2887 | heather.reith@parks.ca.gov |

**TRIBAL CONTACT(S) INFORMATION**

*Name:* Gloria Grimes
*Phone Number:* 209-293-4135
*Email address:* CBmiwukindians.aol.com

**COUNTY ADMINISTRATOR OR PLANNING DIRECTOR CONTACT INFORMATION**

*Name:* Shirley Ryan
*Phone Number:* 209-754-6025
*Email address*: sryan@co.calaveras.ca.us

**NEAREST PUBLIC WATER AGENCY CONTACT INFORMATION**

*Name:* David Eggerton (CCWD)
*Phone Number:* 209-754-3543
*Email address*: davee@ccwd.org

| **Please identify the appropriate project category below and provide the associated details** *(Choose One)* | |
|---|---|
| ☒ Category One Site Improvement<br>☐ Category One Acquisition | ☐ Category Two Pre-Project Activities |
| **Site Improvement/ Acquisition Project Area**<br>Project Area: Calaveras Big Trees State F<br>Total Acres: 230<br>SNC Portion (if different):<br><br>**Acquisition Projects Only For Acquisitions Only**<br>☐ Appraisal Included | **Select one primary Pre-Project deliverable**<br>☐ Permit<br>☒ CEQA/NEPA Compliance<br>☐ Appraisal<br>☐ Condition Assessment<br>☐ Biological Survey<br>☐ Environmental Site Assessment<br>☐ Plan |

**Reith, Heather@Parks**

| | |
|---|---|
| **From:** | Prop 1@CCC |
| **Sent:** | Friday, August 21, 2015 11:20 AM |
| **To:** | Reith, Heather@Parks; Prop 1@CCC; inquiry@prop1communitycorps.org |
| **Cc:** | Hsieh, Wei@CCC; Lussier, Brian@CCC; Mijares, Marie@CCC |
| **Subject:** | RE: SNC Watershed Improvement Program Consultation |

Hi Heather,

Brian Lussier, the Conservation Supervisor at our CCC Greenwood location has responded to the partnership for your project: Big Tree Creek Watershed Forest Restoration. The CCC is able to participate in this project and can do all the fuel reduction work, cutting and piling of materials.

Please include this email and the Consultation Review Document below with your application as proof that you reached out to the CCC. Feel free to contact Brian Lussier Brian.Lussier@ccc.ca.gov directly if your project receives funding.

Thank you,

Wei Hsieh, Manager
Programs & Operations Division
California Conservation Corps
1719 24th Street
Sacramento, CA 95816
(916) 341-3154
Wei.Hsieh@ccc.ca.gov

**California Conservation Corps**
**Proposition 1 - Water Bond**
**Consultation Review Document**

Applicant has submitted the required information by email to the California Conservation Corps (CCC):

✓ Yes (applicant has submitted all necessary information to CCC)

After consulting with the project applicant, the CCC has determined the following:

✓ It is feasible for the CCC to be used on the project and the following aspects of the project can be accomplished (deemed compliant).

- The CCC can do all the fuel reduction work, cutting and piling of materials.

APPLICANT WILL INCLUDE THIS DOCUMENT AS PART OF THE PROJECT APPLICATION.

---

**From:** Reith, Heather@Parks
**Sent:** Thursday, August 20, 2015 5:13 PM
**To:** Prop 1@CCC; inquiry@prop1communitycorps.org
**Subject:** SNC Watershed Improvement Program Consultation

Hello,

I am preparing to send a grant proposal for the SNC Watershed Improvement Program therefore I am sending an email for consultation purposes. Attached is the project information and map. Feel free to contact or email if you need anything further.

*Heather M. Reith*

Heather M. Reith
Senior Environmental Scientist (*Supervisor)*
California State Parks
Central Valley District
22708 Broadway Street
Columbia, CA 95223
Office: (209) 536-2887
Fax: (209) 536-2978

**Mission: To provide for the health, inspiration and education of the people of California by helping to preserve the state's extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality outdoor recreation.**

**Reith, Heather@Parks**

**From:** Prop1 Community Corps <inquiry@prop1communitycorps.org>
**Sent:** Friday, August 21, 2015 10:43 AM
**To:** Reith, Heather@Parks
**Cc:** Prop 1@CCC
**Subject:** Re: SNC Watershed Improvement Program Consultation

Hello Heather,

Nicholas of the San Joaquin Regional Conservation Corps has responded that they are able to assist with the Big Tree Creek Watershed Forest Restoration project if the city receives funding. Please include this email with your application as proof that you reached out to the Local Conservation Corps.

Additionally, please feel free to contact Nicholas Mueller (nmueller@sjcoe.net) directly if your project receives funding.

Thank you,

Dominique

**California Association of Local Conservation Corps**

**Proposition 1 - Water Bond**

**Consultation Review Document**

Applicant has submitted the required information by email to the Local Conservation Corps (CALCC):

✓ Yes (applicant has submitted all necessary information to CALCC)

After consulting with the project applicant, the CALCC has determined the following:

✓ It is feasible for CALCC to be used on the project (deemed compliant)

APPLICANT WILL INCLUDE THIS DOCUMENT AS PART OF THE PROJECT APPLICATION.

On Thu, Aug 20, 2015 at 5:12 PM, Reith, Heather@Parks <Heather.Reith@parks.ca.gov> wrote:

Hello,

I am preparing to send a grant proposal for the SNC Watershed Improvement Program therefore I am sending an email for consultation purposes. Attached is the project information and map. Feel free to contact or email if you need anything further.

*Heather M. Reith*

Heather M. Reith

Senior Environmental Scientist (*Supervisor)*

California State Parks

Central Valley District

22708 Broadway Street

Columbia, CA 95223

Office: (209) 536-2887

Fax: (209) 536-2978

State of California • Natural Resources Agency
Edmund G. Brown, Jr., *Governor*
DEPARTMENT OF PARKS AND RECREATION
Lisa Ann L. Mangat, *Director*
Central Valley District
22708 Broadway Street
Columbia, CA 95310
(209) 536-5930

August 24, 2015

Jim Branham
Executive Officer
Sierra Nevada Conservancy
11521 Blocker Dr., Suite 205
Auburn, CA 95603

Dear Mr. Branham:

**RE: SIERRA NEVADA WATERSHED IMPROVEMENT GRANT PROGRAM AUTHORIZATION TO APPLY - CALAVERAS BIG TREES STATE PARK**

As required by the Sierra Nevada Conservancy (SNC) Sierra Nevada Watershed Improvement (SNWI) Grant Program for fiscal year 2015/2016, this letter is written to inform you that the natural resources staff of the Central Valley District of the Department of Parks and Recreation has been authorized to apply for a SNC Sierra Nevada Watershed Improvement grant. Specifically, staff is authorized to apply for the BIG TREE CREEK WATERSHED FOREST RESTORATION PROJECT at Calaveras Big Trees State Park.

The project would greatly assist the Department in its stewardship of the Big Tree Creek and surrounding mixed conifer forest. The project will also help in our effort to protect the North Grove of giant sequoias that was previously funded by SNC. This area of Calaveras Big Trees State Park is a major tourist attraction and considered the longest continuously operated tourist facility in California ever since August T. Dowd discovered the first Sierra redwood in 1852.

The Department certifies that it has sufficient funds to operate and maintain the resource(s) consistent with the long-term benefits described in support of the application and will comply with all applicable legal requirements.

If the project is selected for grant award, I hereby appoint Heather M. Reith, Senior Environmental Scientist, as my agent and representative to conduct all negotiations, execute and submit all documents, including but not limited to: applications, agreements, payment requests, etc. which may be necessary for the completion of the aforementioned project.

Sincerely,

Jess C. Cooper

Jess C. Cooper
District Superintendent

## 6. Narrative Descriptions

### a. Detailed Project Description:

Calaveras Big Trees State Park (CBT) is located midway up the western slope of the Central Sierra Nevada. Public access to the park is via State Route (SR) 4. CBT resides between the unincorporated town of Arnold and the community of Big Trees Village.

The Big Tree Creek Watershed Forest Restoration Project (BTCW-FRP or the Project) is located directly north of the North Grove of giant sequoias and south of the community of Big Trees Village. It is in proximity to the Calaveras County Water District's (CCWD) easement that contains an 80,000 gallon redwood water tank that supplies water to CBT and the community of Big Trees Village.

Work will be done within the Big Tree Creek Watershed (BTCW). This small creek's upper watershed is entirely contained in CBT (General Plan, 1989). The creek flows through the Calaveras North Grove (providing water to the giant sequoias forest), the North Grove Meadow (10 acre wet meadow), then flows out of the park near SR 4 where it flows into the Upper San Antonio Creek Watershed. The Upper San Antonio Creek Watershed flows to the San Joaquin River Watershed.

The purposes and goals of this multi-benefit project are to restore 235 acres, dominated by ponderosa pine, to a heterogeneous stand structure and to enhance the BTCW through removal of overstocked understory and shade-tolerant trees, such as white fir. Reducing fuel loads throughout the BTCW and creating forest heterogeneity will result in habitat conditions that are conducive and suitable for wildlife, as well as create a healthy forest resistant to pests and disease. Furthermore, this project will reduce the vulnerability of the forest to catastrophic wildland fire that would greatly impact CBT and the BTCW by way of increased water temperatures, soil scorch leading to erosion, followed by sediment and nutrient buildup in the water system.

Project work will reduce understory fuels creating a healthy, fire resilient forest that will benefit the watershed and reduce the risk fire damage to the redwood water tank that supplies clean healthy drinking water to CBT and the neighboring community. Other project deliverables include creation of a healthier creek system by removal of high fuel loads that could burn at high temperatures leading to the development of a hydrophobic crust that repels and flushes water away instead of allowing the soil to absorb water as part of the filtration process; reduction of over accumulated biomass will reduce chances of wildland fire that create conditions leading to erosion issues (i.e. excess nutrients and sediments to watersheds after rain events); removal of an overabundant understory of shade tolerant trees will make more

water available to this creek system and provide more water to the giant sequoias. The water supplied by Big Tree Creek is essential for the giant sequoias, general forest health and the State's water supply in the face of climate change (i.e. hotter winters, less snowpack).

The end result would be an ecologically healthy forest resilient to wildland fire, a watershed that will support the forest community, and a soil structure that is capable of filtering nutrients for a clean water system.

The scope of work includes conducting pre-project surveys for California spotted owls and northern goshawks unless operations begin outside of the critical period for nesting raptors. Forest restoration work will be completed by labor crews provided by the California Conservation Corps (CCC) and California State Park (CSP) who will use chainsaws, loppers, and other hand tools as required. Work includes:

- Thin from below to reduce ladder and canopy fuels, and to reduce overall stand density.
- Reduce the stems per acre from up to 400 per acre to 100-200 stems per acre, dependent on slope, aspect, and soil. All trees will be marked by a CSP Environmental Scientist (ES) or designee.
- Reduce surface woody debris from 35-80 tons/acre to less than 10-25 tons/acre. (Brown, J.K. 1974.)
- Wildlife corridors will be managed by leaving shrubs for cover and forage purposes determined by CSP-ES.
- Retain quality downed logs and snags for wildlife habitat.
- Remove or pile to burn, 60%-90% of total surface fuel load.
- Woody debris that is removed will be: 1) piled in 5' X 5' piles for future burning; 2) removed and sent to a biomass power plant; 3) chipped and material stored in the park's maintenance yard for future erosion control purposes; and/or 4) removed and stored in the park's maintenance yard for the park's wood program.
- Burn piles in the appropriate season and weather conditions with burn permits and smoke management permit from Cal Fire and Calaveras Air Pollution Control District.

Overall this project will restore this Sierra forest and watershed to a healthier state; improve the quantity and quality of water; improve habitat for wildlife, fish, and plant species; reduce the risk of a large damaging wildfire; and improve conditions for public safety.

**b. Workplan and Schedule:**

The BTCW-FRP implementation will be July 2016 through June 2019 and will include outreach to staff, volunteers, local community and public through flyers, press releases, and signage. Photo point locations will be selected and photos taken from each point. Fixed area plots (0.1 acre circular plots) will be randomly selected, marked and data recorded at each plot on fuel

loads and vegetation. Surveys for raptors will precede all project work in the field. 2016 understory treatment will begin after the above tasks are accomplished and will continue until late November 2016. Work will then focus on burning piles each December through April with fuels treatment resuming each May-November until the final field season ends June 2019. Six-month progress reports begin in January 2017 and every six months thereafter. The final report, including the data related to the project performance measures will be completed by June 2019.

| DETAILED PROJECT DELIVERABLES | TIMELINE |
|---|---|
| Conduct raptor surveys | July, 2016 |
| Make, staff, volunteer, community and media contacts and inform public about the project. Post signs and print handouts for community boards.<br>Select photo point locations and take photos.<br>Train staff and volunteers on public interpretation of project and how to tally numbers of public contacts. | July, 2016 |
| Flag project boundaries, flag all sensitive resource areas including snags, logs, and shrubs that will not be removed.<br>Set up fixed area plots and take stand measurements. | July – August, 2016 |
| Train laborer crews on work specifications. | July – August, 2016 |
| Mark trees for removal and start fuels treatment work | August – November, 2016 |
| Burn piles when conditions are appropriate | December, 2016 – March, 2017 |
| Complete 1st six-month report | January, 2017 |
| Conduct raptor surveys.<br>Resume fuels treatment work. | April – November, 2017 |
| Complete 2nd six-month report | July, 2017 |
| Take photo point pictures during same period as prior year. | July – August, 2017 |
| Burn piles when conditions are appropriate | December, 2017 – March, 2018 |
| Complete 3rd six-month report | January, 2018 |
| Conduct raptor surveys.<br>Resume fuels treatment work. | April – November, 2018 |
| Complete 4th six-month report | July, 2018 |
| Take photo point pictures during same period as prior year. | July – August, 2018 |

| | |
|---|---|
| Burn piles when conditions are appropriate | December, 2018 – March, 2019 |
| Complete 5th six-month report | January, 2019 |
| Resume fuels treatment work and conduct any quality control measures needed to complete project.<br>Take stand measurements.<br>Take photo point pictures for final report. | March, 2019 – June, 2019 |
| Complete Final report including data related to the project performance measures | June, 2019 |

**c. Restrictions, Technical/Environmental Documents and Agreements**

There are no property restrictions and/or encumbrances that would adversely impact completing this project.

**Regulatory Requirements/Permits:**

A burn permit from the California Department of Forestry (Cal Fire) and a Smoke Management Plan and wildland vegetation management burn permit from the Calaveras County Air Pollution Control District (APCD) are required for this project.
Permits with the Department of Fish and Game are not required because project will not impact any rare plants, animals or waterway. A permit from the U.S. Fish and Wildlife Service is not required because the BTCW-FRP will not impact any federally threatened or endangered species. A U.S. Army Corps of Engineers permit may necessary for this project because the waters within BTC may be considered part of their jurisdiction. Consultation will be conducted to determine if a permit will be required. Permits with the State Historic Preservation Office are not applicable because there will not significant impacts to historic or cultural resources from the BTCW-FRP.

**CEQA:** The BTCW-FRP has gone through the environmental review process as part of the North Grove Forest Restoration project. A Notice of Exemption has been filed with the State Clearinghouse. The original State Clearinghouse number is 2010118195. The project was amended in 2013 to include the entire watershed. This State Clearinghouse number is 201303894.

**NEPA:** This project will not be funded by a federal entity and will not take place on federal public lands therefore no NEPA review is necessary.

**d. Organizational Capacity:**

The North Grove Forest Restoration Project is a cooperative project between the Department of Parks and Recreation and the California Conservation Corps (CCC). The California Department of Parks and Recreation (DPR) have a 44-year history of fuel management and prescribed fire management at CBT. Heather Reith, Senior Environmental Scientist, at CBT has 13 years of natural resource management experience working for State Parks and the U.S. Forest Service. Joe Harvey, Environmental Scientist, at CBT has 18 years of natural resource management experience with the U.S. Forest Service, California Department of Fish and Wildlife, State Parks, and other agencies. The CCC crews provide a cost-effective labor crew for natural resource projects throughout California and have worked on a number of forest restoration projects at CBT including the Sierra Nevada Conservancy funded North Grove Forest Restoration project.

**e. Cooperation and Community Support:**

The BTCW-FRP will utilize CCC crews and CBT staff to conduct the project work. CBT has a long-standing relationship with the CCC. Heather Reith, Senior Environmental Scientist, has worked with the CCC crews for approximately 5 years at the park. CBT is considered one of the most important historic and ecologically unique parks in California. CBT receives a great deal of support, from the local community and from visitors around the world. That support is reflected in the letters of support offered as part of this proposal:

**f. Tribal Support:**

The CEQA documentation was completed prior to the enactment of AB52 therefore consultation was not part of this process. However, staff will communicate with the local tribal representatives, prior to project start date, to discuss the project and gain support for the project.

**g. Long-Term Management and Sustainability:**

Ongoing fuel and fire effects monitoring is a critical component of any forest restoration project. CSP is committed to tracking the accumulation of fuels over time and to the continued use of prescribed fire at CBT. Fire history studies at CBT and in other giant sequoia dominated stands estimates the historic fire return interval range from 2 to 30 years, with a mean of 10 years (Swetnam, T.W. 1993). The BTCW-FRP area is a priority area for CBT resource managers; maintenance of the project area is planned through low intensity, controlled burns in ten year cycles which will assure the long-term sustainability of this restoration project. The long-term management of the BTCW-FRP will be funded in-house by the CSP's On-Going Maintenance Program, CSP Stewardship Program or through cooperative agreements with other State agencies.

CSP staff is currently working on finalizing CBT's Vegetation Management Plan funded by the SNC's Proposition 84 Healthy Forest Program which will address long-term management and sustainability for the entire park. The plan has a completion date of May 2016 and will include language allowing SNC annual monitoring of the project area for 25 years. Currently, CSP staff is scheduled to monitor the project area through photo point documentation on an annual basis for 25 years and to send documentation to SNC for review. However, if SNC would like to inspect the project site annually, meetings can be established for project site visits.

(Long-Term Management Plan: See Attached "LTMP" file.)

**h. Performance Measures:**

**a. Acres of Land Improved or Restored**

The entire CBT State Park is on the Cal Fire's "Fire Hazard Severity Zone Map" as an area of "High Severity". This high fire threat affects the Big Tree Creek Watershed and Upper San Antonio Creek Watershed, which are critical water sources for the park and adjacent communities; high fire danger also threatens the historic grove of giant sequoias and other resources that are held in perpetuity by CSP. Pre-project forest measurements will be conducted to document fuel loading and basal area using fixed area plots. Photo points will be used before, during, and after project implementation for visual comparison.

**b. Number and Type of Jobs Created**

The communities starting at Hathaway Pines and traveling easterly along the SR 4 are economically depressed and in need of employment opportunities. This grant would provide seasonal work for 14 individuals for at least 3 years. Other funding sources will be sought after to sustain employment after project completion.

**c. Number of People Reached**

Before field work begins in July, 2016, contacts will be made with the staff, volunteers, Native American community, the local community and media through printed handouts, posted signs at the project site, and personal communication. At all times during field work, printed handouts will be kept at the park's visitor center and the entrance station to educate the public.

**SIERRA NEVADA CONSERVANCY**
**SNC Watershed Improvement Program - DETAILED BUDGET FORM**

**Project Name:** Big Tree Creek Watershed Forest Restoration

**Applicant:** Heather M. Reith, California Department of Parks & Recreation

| SECTION ONE<br>DIRECT COSTS | Year One | Year Two | Year Three | Year Four | Year Five | Total |
|---|---|---|---|---|---|---|
| *California Conservation Corps* | $62,499.99 | $62,499.99 | $62,499.99 | | | $187,499.97 |
| *State Park Environmental Scientist* | $8,650.00 | $8,650.00 | $8,650.00 | | | $25,950.00 |
| *State Park Laborer Crew* | $65,579.00 | $65,579.00 | $65,578.50 | | | $196,736.50 |
| *Project Materials and Equipment* | $19,666.98 | | | | | $19,666.98 |
| *Contract (Chemical Toilets)* | $1,280.00 | $1,280.00 | $1,280.00 | | | $3,840.00 |
| | | | | | | $0.00 |
| | | | | | | $0.00 |
| **DIRECT COSTS SUBTOTAL:** | $157,675.97 | $138,008.99 | $138,008.49 | $0.00 | $0.00 | $433,693.45 |

| SECTION TWO<br>PARTIAL INDIRECT COSTS | Year One | Year Two | Year Three | Year Four | Year Five | Total |
|---|---|---|---|---|---|---|
| *Environmental Scientist (Monitoring)* | $1,400.00 | $1,400.00 | $1,400.00 | | | $4,200.00 |
| *Environmental Scientist (Reporting)* | $700.00 | $700.00 | $700.00 | | | $2,100.00 |
| *Environmental Scientist (Performance Measures)* | $350.00 | $350.00 | $350.00 | | | $1,050.00 |
| *Office Technician (Reporting & Invoice Billings)* | $4,334.00 | $4,334.00 | $4,334.00 | | | $13,002.00 |
| *Interpretive Sign* | $500.00 | | | | | $500.00 |
| **INDIRECT COSTS SUBTOTAL:** | $7,284.00 | $6,784.00 | $6,784.00 | $0.00 | $0.00 | $20,852.00 |
| **PROJECT TOTAL:** | $164,959.97 | $144,792.99 | $144,792.49 | $0.00 | $0.00 | $454,545.45 |

| SECTION THREE<br>Administrative Costs (Costs may n*ot exceed 15% of the above listed Project costs*) : | | | | | | Total |
|---|---|---|---|---|---|---|
| *Organization operating/overhead costs* | $16,496.00 | $14,479.30 | $14,479.25 | | | $45,454.55 |
| | | | | | | $0.00 |
| | | | | | | $0.00 |
| | | | | | | $0.00 |
| | | | | | | $0.00 |
| **ADMINISTRATIVE TOTAL:** | $16,496.00 | $14,479.30 | $14,479.25 | $0.00 | $0.00 | $45,454.55 |
| **SNC TOTAL GRANT REQUEST:** | $181,455.97 | $159,272.29 | $159,271.74 | $0.00 | $0.00 | $500,000.00 |

| SECTION FOUR<br>OTHER PROJECT CONTRIBUTIONS | Year One | Year Two | Year Three | Year Four | Year Five | Total |
|---|---|---|---|---|---|---|
| *List other funding or in-kind contibutors to project (i.e. Sierra Business Council, Department of Water Resources, etc.)* | | | | | | |
| *Sr. Environmental Scientist Oversight & Management (In-Kind Contribution)* | $15,360.00 | $15,360.00 | $15,360.00 | | | $46,080.00 |
| *Environmental Scientist (Post Project Monitoring)* | | | | $2,240.00 | $2,240.00 | $4,480.00 |
| | | | | | | $0.00 |
| | | | | | | $0.00 |
| | | | | | | $0.00 |
| | | | | | | $0.00 |
| **Total Other Contributions:** | $15,360.00 | $15,360.00 | $15,360.00 | $2,240.00 | $2,240.00 | $50,560.00 |

**NOTE:** The categories listed on this form are examples and may or may not be an expense related to the project. Rows may be added or deleted on the form as needed. Applicants should contact the SNC if questions arise.

# CALAVERAS BIG TREES VEGETATION MANAGEMENT PLAN

**2015**

State of California
**California State Parks**

DRAFT

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# I. INTRODUCTION

This plan addresses the management of plant 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 so influential to the entire ecosystem. They 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 park managers 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, these 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 inconsistent with previous actions. A long term vegetation management plan can ensure continuity of actions toward mutually accepted management goals and objectives.

## A. Purpose

This plan defines the need for park managers 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 defines goals for these plant communities in terms of a desired condition for each, describes the range of acceptable management practices, and establishes guidelines for how and when they are to be used, describing any constraints that may limit their application.

By creating and implementing this plan, it is the intent of park 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.

# II. AUTHORITY

Policies that provide direction for resource managers in the California Department of Parks and Recreation (DPR) are found in various documents, ranging from the general to the specific. General policy is established primarily in the state's Public Resources Code, which provides a framework upon which more specific policies and guidelines are developed. DPR expands on this framework through the creation of statewide policies designed to provide general direction to field staff. At the field level, policies and guidelines specific to each park unit may be described in various documents, such as the unit's general plan, or specific management plans, such as this one. The following sections are descriptions of various policies that are appropriate to this vegetation management plan.

## A. Public Resources Code (PRC)

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1. PRC § 5019.53(a): State parks consist of relatively spacious areas of outstanding scenic or natural character, oftentimes also containing significant historical, archaeological, ecological, geological, or other similar values. The purpose of state parks shall be to preserve outstanding natural, scenic, and cultural values, indigenous aquatic and terrestrial fauna and flora, and the most significant examples of ecological regions of California, such as the Sierra Nevada, northeast volcanic, great valley, coastal strip, Klamath-Siskiyou Mountains, southwest mountains and valleys, redwoods, foothills and low coastal mountains, and desert and desert mountains.

   Each state park shall be managed as a composite whole in order to restore, protect, and maintain its native environmental complexes to the extent compatible with the primary purpose for which the park was established.

   Improvements undertaken within state parks shall be for the purpose of making the areas available for public enjoyment and education in a manner consistent with the preservation of natural, scenic, cultural, and ecological values for present and future generations. Improvements may be undertaken to provide for recreational activities including, but not limited to, camping, picnicking, sightseeing, nature study, hiking, and horseback riding, so long as those improvements involve no major modification of lands, forests, or waters. Improvements that do not directly enhance the public's enjoyment of the natural, scenic, cultural, or ecological values of the resource, which are attractions in themselves, or which are otherwise available to the public within a reasonable distance outside the park, shall not be undertaken within state parks.

A portion of CBTSP has been given separate classification, in recognition of its special character and pristine beauty. In 1986, the State Parks Commission created the Calaveras South Grove Natural Preserve. The PRC defines this classification thusly:

2. PRC § 5019.71: Natural preserves consist of distinct areas of outstanding natural or scientific significance established within the boundaries of other state park system units. The purpose of natural preserves shall be to preserve such features as rare or endangered plant and animal species and their supporting ecosystems, representative examples of plant or animal communities existing in California prior to the impact of civilization, geological features illustrative of geological processes, significant fossil occurrences or geological features of cultural or economic interest, or topographic features illustrative of representative or unique bio-geographical patterns. Areas set aside as natural preserves shall be of sufficient size to allow, where possible, the natural dynamics of ecological interaction to continue without interference, and to provide, in all cases, a practicable management unit. Habitat manipulation shall be permitted only in those areas found by scientific analysis to require manipulation to preserve the species or associations that constitute the basis for the establishment of the natural preserve.

## B. California State Park and Recreation Commission

General Plan: In 1989, the California State Parks Commission approved a general plan for CBTSP. This document includes polices specific to the management of resources in the park. Those that are specific to this plan include the following:

1. General Vegetation Management

On lands other than those supporting facilities, vegetation shall generally be managed toward a natural condition; that is, toward plant communities that result from normal successional trends which prevail in the presence of all natural factors normal to the region, and in the absence of interference from humankind. In areas previously modified, ongoing efforts shall be made to encourage restoration of vegetation toward a natural condition. The natural state of the vegetation shall be determined through scientific analysis, by means and techniques approved and adopted by the department. Specific vegetation management programs shall be devised and implemented as necessary and appropriate.

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2. Sierra Redwood Groves

The department shall manage the North and South Calaveras Groves in such a manner as to restore, if necessary, and to maintain conditions in as nearly as possible the natural manner that would have occurred in the absence of all interference by Euroamerican people, including, in such interference, the exclusion of natural fires. In establishing the detailed objective of this management policy, the department shall take into account all available information on this subject, and apply it to the circumstances at Calaveras Big Trees State Park, consistent with the department's prescribed fire management policies.

In applying prescribed fire in the natural environment, the department shall strive to simulate the effects of natural fires as they occurred in prehistoric times. Emphasis shall be given to duplicating the frequency and distribution of such fires, and the department shall provide for any needed research to determine such characteristics.

Protection of the natural integrity of the Sierra redwood groves shall apply to the extent and distribution of the trees, as well as to the ecological conditions of the groves. While no effort should be made to remove Sierra redwood trees planted outside the grove limits in decades past, further planting outside the natural grove limits (not including outlying trees as part of the grove) shall not be done or allowed by the department. If natural seeding occurs outside the grove limits, this shall be considered a natural phenomenon, and accepted as such.

3. Other Primeval Forests

The department shall strive to restore and maintain natural conditions in all the primeval forests of the park, just as in the Sierra redwood groves themselves. The park objective shall be to achieve a natural distribution and proportion of the various species, not influenced by any artificial or external considerations. The department shall prepare, adopt, and implement detailed resource management plans applicable to the various natural units in the park; such plans shall specify the manner in which these objectives shall be pursued in each such area.

4. Cutover Areas and Young Forests

If it should be deemed desirable to plant tree species, either to aid in the recovery and naturalization of cutover areas in the park, or for any other reasons, the planting stock used shall be only from seed obtained in the park or its immediate vicinity, so no genetically different strains from more distant regions will be introduced into the park. See also DOM Section 0310.4.1 on Department's Genetic Integrity Policy.

5. Control of Alien Plant Species

The department staff shall continue efforts to reduce, and ultimately eliminate, alien plant species occurring at Calaveras Big Trees. Use of herbicides is discouraged, unless all other practical methods or removal have proven to be ineffective. See also DOM Section 0310.7 on Department's policy on Exotic Plant Control.

6. Grasslands and Meadow Restoration

The department shall develop and implement a program designed to restore the moisture level in the meadow near the North Grove, and to replace the alien species with native grasses and forbs. The objective shall be to restore the meadow as nearly as possible to its original, natural condition.

7. Ecological Values – Special Ecosystems

Resource management at Calaveras Big Trees State Park shall have as its primary objective perpetuation of natural ecological systems. Management shall not be directed at promoting single species or purposes. The focus of management shall be the Sierra redwood ecosystems with all it biological elements and entities, but not the promotion of individual species or specimens.

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## C. DEPARTMENT OPERATIONS MANUAL (DOM) POLICY

Statewide resource management policies are contained in Chapter 0300 of the Department Operations Manual (DOM). Policies that pertain to this plan include the following (listed by section number):

1. DOM §0304
   The term 'native' or the term 'natural', when referring to native plant and animal communities or natural processes, refers to those organisms and processes that have co-evolved in the California landscape for thousands of years and were present in California prior to Euro-American modification.

   Whenever possible, natural processes will be relied upon to maintain native plant and animal species, and to influence natural fluctuations in populations of these species. However, biological or physical processes altered by human activities often need to be restored to a natural condition or the closest approximation of the natural condition through management intervention. The Department will seek to return human-disturbed areas to natural conditions characteristic of the area in which the damaged resources are situated. Prescribed burning to restore natural fire cycles after decades of wildfire suppression is one example.

2. DOM § 0306.2
   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.

3. DOM § 0306.7
   It is the policy of the Department to prevent the destruction, loss, or degradation of wetlands by:

   a. Identifying wetland resources and determining appropriate uses;
   b. Preserving and enhancing the natural and beneficial values of wetlands;
   c. Avoiding direct and indirect construction and actions in wetlands unless the benefits of the facility or activity clearly outweigh the potential adverse impacts, there are no practicable alternatives, and the proposed action includes all practicable measures to minimize harm to wetlands;
   d. Adhering to and implementing the DPRs Wetland's Conservation Policy of no net loss of wetlands and a longer-term goal of a net gain if wetlands across the park system through restoration of previously degraded or destroyed wetlands;
   e. Adhering to and implementing the Keene-Nejedly California Wetlands Preservation Act (PRC § 5810-5818); and
   f. Avoiding and discouraging offsite mitigation as a means of increasing wetlands when such mitigation would propose the creation of wetland features in uplands that were not historically and naturally wetlands.

   When natural wetland characteristics or functions have been degraded or lost due to previous or ongoing human actions, the Department will, to the extent appropriate and practicable, restore them to pre-disturbance conditions.

4. DOM § 0310.1
   The general goal of plant management in the State Park System is to protect, restore, and maintain native plant populations and naturally occurring plant communities. When feasible, this will be accomplished through maintenance or re-establishment of natural processes such as fire, flooding, and succession.

   Plant management of natural areas usually differs from that of developed portions of units, although some vegetation management principles are common to both situations and to all classifications of units. For example, landscaping with invasive exotic plants is not appropriate in either natural or

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developed portions of units of the State Park System. Some management goals may be specific to the purpose of establishment and the resource management objectives of an individual park unit.

5. DOM § 0310.2.1
   It is the policy of the Department to manage to restore and perpetuate natural succession by:

   a. Re-introducing natural processes when they have been altered by human intervention such as fire suppression;
   b. Restoring seral stages of plant communities in areas that can no longer support a natural process;
   c. Restoring mosaics of successional stages.

   Exceptions to the policy may occur when a unit is managed to favor a particular seral stage as a condition of unit establishment. For example, an early successional stage is specified in the Declaration of Purpose for Azalea SR, whereas redwood parks are generally managed to promote late successional stages.

6. DOM § 0310.5.1
   It is the policy of the Department to protect rare plants and their habitats in fulfillment of its mission to help preserve the State's extraordinary biological diversity, and in accordance with the California Endangered Species Act and the California Native Plant Protection Act. These taxa and habitats will be protected in the context of the native environmental complexes in which they evolved, when feasible.

7. DOM § 0310.7.2
   Exotic plant species will be managed – up to and including eradication – if (1) control is prudent and feasible, and (2) the exotic species has a deleterious impact on:

   - Abiotic processes (such as fire occurrence, frequency, and intensity; erosion and sedimentation; hydrologic regimes; nutrient dynamics; and light availability); or
   - Biotic community composition and interactions; or
   - Vegetation structure; or
   - Genetic integrity; or
   - Aesthetic resources; or
   - Cultural resources; or
   - Public health and safety.

   Consideration will be given to managing exotic species that have, or potentially could have, a substantial impact on park resources, and that can reasonably be expected to be successfully controllable. High priority will be accorded those species that cause ecological damage and have the greatest potential to spread rapidly or to increase in cost to control. Lower priority will be given to exotic species that have almost no impact on park resources or that probably cannot be successfully controlled. See also DOM § 0315.4 regarding Unit Level Planning.

   For species determined to be invasive and where management appears to be feasible and effective, the Department should:

   Develop a control strategy based on reasonable funding scenarios including the ability to maintain accomplishments using park maintenance funds (see DOM § 0313.1.1.1);
   - Understand available methodology and appropriateness for park control efforts;
   - If appropriate, develop interpretive programs that educate park visitors and the public about the problems caused by exotic plants and the measures used in their control;
   - Where appropriate, invite public review and comment.

   A number of tools are available for the control of exotic plants. Programs to manage exotic species will be designed to avoid causing significant damage to native species, natural ecological communities,

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natural ecological processes, cultural resources, and human health and safety. See also DOM § 0700, Pest Control.

Where feasible, the Department will cooperate with adjacent landowners or groups such as Weed Management Areas to control exotic populations more effectively. A control strategy that includes control of seeds or other propagules will be sought.

The immediate removal of new invasions is the most effective method of controlling highly invasive species. District Resource Ecologists will complete, or cause to be completed, annual inspections of each unit to determine whether infestations of any new exotic plants occur in their units.

8. DOM § 0311.4.1
   It is the policy of the Department to protect, maintain and restore, where appropriate, natural faunal habitat and ecosystem processes. All aspects of animal habitat and wildlife needs for particular habitat elements will be considered when planning and/or permitting for facility siting, park operations, maintenance activities, routing trails, visitor use, and special events.

9. DOM § 0313.2
   Wildland fire, whether human-caused or naturally ignited, may contribute to or hinder the achievement of park management objectives. Therefore, park fire management programs will be designed to meet park resource management objectives while ensuring that firefighter and public safety are not compromised.

10. DOM § 0313.2.1.1.1
    It is the policy of the Department that each Department-operated unit that may experience wildland fires will have a wildfire management plan providing requisite information for managing wildfire events, such as the locations of sensitive park resources, facilities, water supplies and existing roads. Wildfire management plans will be reviewed by designated headquarters staff and approved by the District Superintendent.

11. DOM § 0313.2.1.2
    The Department maintains wildland properties in order to preserve the natural, cultural, and scenic features for the people of California. Many of these native ecosystems contain plants that can become flammable under specific environmental conditions of high wind, high temperature and low humidity. These ecosystems inevitably burn either from natural or human causes. Buildings constructed adjacent to park units in the wildland-urban interface zone are at risk from wildland fires. There are three principal causes of ignition of structures in this zone.

    The first cause involves the ignition of accumulations of ignitable materials on, under, or next to the structure, which, in turn, ignite decking or enter attics through soffit vents. This material can be ignited via ground fires or aerial flaming brands. This threat can be eliminated by removing all flammable debris that has accumulated on or under the building, clearing the vegetation that is within 30 feet of the building, and screening all openings to the attic or under the structure.

    The second cause involves aerial flaming brands, which land directly on flammable surfaces of the structure. These brands can originate from wildfires over one half-mile away from the structure. Buildings that are constructed to strict codes of ignition-resistive materials are at very low risk of ignition from flaming brands.

    The third cause is severe radiant/convective heat of burning material near the structure which can: 1) ignite the sides of the building, 2) break the windows, allowing burning embers into the interior of the building, 3) ignite the interior furnishings through the windows, or 4) burn/deform the window casings causing the windows to slip out.

    Fire modeling, analysis of past wildland-urban interface zone fires, and experiments to determine the ignitability of structures have confirmed that even the radiant/convective heat of extreme flaming fronts

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poses low risk to any structure which is 130 feet or more distant, especially if that structure conforms to strict interface fire codes of ignitability, and window strength and reflectivity.

The Department routinely receives requests/demands from outside entities to clear wildland vegetation on Department lands in order to:

- Reduce the threat of wildfire to private property;
- Reduce fire insurance costs to private landowners;
- Comply with strict local ordinances; and
- Mitigate the threat of liability for maintaining a dangerous condition.
- Department lands have also been subjected to trespass and encroachment by persons illegally attempting to modify the vegetation. Modifying ecosystems on park properties for the purpose of protecting adjacent private structures from wildland fire can significantly degrade park values and in some cases adversely impact populations of threatened endangered species and cultural resources.

12. DOM § 0313.2.2
    Recurring fires were an integral part of the evolution of most wildland ecosystems in California. Although the restoration of fire as an ecological process remains an important goal, fire is also used to reduce threatening accumulations of fuels, control exotic plant species, protect forest soils, restore native plant assemblages, and improve habitat for wildlife. Prescribed fire is applied within appropriate ecological parameters. Fire is a disruptive influence in any ecosystem, and must be used with assurance that the end result will be consistent with the Department's mandate to preserve and protect California's natural heritage.

13. DOM § 0313.2.2.1
    It is the policy of the Department to restore fire to its proper role in native ecosystems in accordance with the broader charge to restore and perpetuate natural ecological processes in the natural environments of the State Park System. Other important objectives consistent with the policy to restore fire to native ecosystems are the prevention of damaging fires from excessive fuel load and abnormal plant community structure, the improvement of wildlife habitat, the control of exotic species, and various other ecological objectives.

14. DOM § 0313.2.2.7
    The unit prescribed fire management plan sets forth the objectives and details of a unit-wide, multi-year program and is reviewed under CEQA for environmental compliance. It is required when project burning for a unit expands beyond small single-purpose burns or experimental burning of a limited nature.

15. DOM § 0313.2.2.8
    The project burn plan defines the objective, setting, constraints and parameters of a specific burn including the desired environmental consequences and the need for safely manipulating fire to achieve the desired objectives.

    A project burn plan provides sufficient information to allow for an environmental review of potential impacts, as required under CEQA. When treated as a "stand-alone" document the project may be granted a Categorical Exemption, or more stringent environmental review may be required. Alternatively, project burn plans may be done under a programmatic, unitwide burn plan (unit prescribed fire management plan) that has undergone environmental review. Under these circumstances, the project burn plan must demonstrate (through the Project Evaluation Form process) that it is substantially in compliance with the environmental review of the unitwide plan, and therefore exempt from further review. If it is not, then the project burn plan should be treated as a "stand-alone" document.

    In either case – whether an overall unit prescribed fire management plan exists or not – project burn plans are essentially the same. The difference is in the degree of required environmental review.

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16. DOM § 0319.1
    It is the policy of the Department to interpret not only the natural resources of the parks and their values, but also the management actions and issues addressed in the Department's resource management programs. Interpretation will be an integral part of the resource management function of every park and included in General Plans, concession contracts, and unit resource management plans where appropriate and needed. Interpretation will be considered an essential part of dealing with statewide or regional resource management issues, and interpretation of complex issues will be included in interpretive planning. Additional information on natural resources interpretation can be found in the Natural Resources Handbook.

### D. OTHER RELATED LAWS AND REGULATIONS

1. Federal and State Endangered Species Act
2. California Environmental Quality Act (CEQA)
3. 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}.
4. Permits
    a. Burn Permit: Issued by CAL FIRE
    b. Smoke Management Permit: Issued by the Local Air Pollution Control District.
    c. California Department of Fish and Wildlife Stream Alteration Permit
    d. Corps of Engineers 404 Permit
    e. Regional Water Quality Control Board Permit
    f. National Pollutant Discharge Elimination System Permit

## III. GOALS

Goals and rationale for long-term vegetation management for CBTSP

- To protect, preserve, and when necessary, restore the ecological processes that naturally manage the park's vegetative communities.
- Reduce fuel loadings throughout the park to obtain forest heterogeneity conditions that are conducive and suitable for wildlife habitat.
- Reduce fuel loadings throughout the park to reduce vulnerability to catastrophic wildland fire.
- Reduce fuel loadings to create a healthy forest resistant to pest and disease.
- In developed areas, reduce dead trees (snags) that pose a risk for public health and safety.

## IV. 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 6820 acres (2760 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 1450 acre (590 hectares) natural preserve was established in 1984.

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## 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 5230 and 5560 feet (1600 and 1700 meters) respectively, while the lowest elevation is where the North Fork leaves the park at 3415 feet (1040 meters). Most of the park is between 4000 and 5000 feet (1220 and 1320 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 Gulf of California. Wide fluctuations in precipitation and temperature for periods of years are not uncommon with documented multi-year droughts and back-to-back wet years.

### 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, Swetnam, pers. com). 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 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.

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## 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 (0.75 m). 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, a California State Parks Representative Keystone Watershed that represents; physical, biological, and especially 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 about one mile to the southeast, draining 20,299 acres (8215 hectares) 10% of which is within CBTSP. Beaver Creek eventually joins the North Fork downstream from the park boundary (CSP, 2007).

Three minor drainages occur in the park, two of which are entirely within the borders. Big Trees Creek (in the South Grove Natural Preserve) is the largest of the three, draining an area of about 1400 acres (570 hectares) and flowing into Beaver Creek while still within the park. 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, (formerly known as Squaw Hollow Creek) are 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.

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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.

### G. Vegetation (Figure 3)

Calaveras Big Trees State Park lies within the Lower Montane Forest zone of the Sierran Floristic Province, a broad belt lying between 3000 and 6000 feet (915 to 1830 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. However, decades of fire exclusion have allowed the shade tolerant white fir to successfully colonize into and become co-dominant with ponderosa pine, while this latter species has, in the absence of stand opening disturbance, undergone reproductive collapse, and there currently is not enough ponderosa regeneration to support the species in the long term, without significant management effort.

Of great interest are the two groves of giant sequoia located at CBTSP (Figure 3). 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 1000 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.

Shrub species include greenleaf manzanita (*Arctostaphyllus patula*), whitethorn (*Ceanothus cordulatus*), deerbrush (*C. integerrimus*), buckbrush (*C. cuneatus*), western hazelnut (*Corylus cornus californicus*), Sierra coffeberry (*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' lomatium (*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

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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 are dependent on frequent (ca. 10 year) naturally occurring and relatively low intensity fires. 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*), and Douglas squirrel (*Tamiasciurus douglasii*). Bird species found in the forest habitat include the mountain chickadee (*Poecile gambeli*), golden-crowned kinglet (*Regulus satrapa*), red-brested 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 (*Oricorhynchus 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

Calaveras Big Trees 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.

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Native Americans: 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 used for most of the 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, and the park continues to expand as desirable properties become available. 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.

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# V. PAST MANAGEMENT HISTORY

## A. Vegetation Management Prior to 1975

For thousands of years 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 typically were 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 past, 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.

At the same time, other forest conditions were being noticed that indicated decline in the absence of fire. Ponderosa pines, for instance, whose seedlings require ample sun, were also not reproducing, since the forest floor was deeply shaded by other species that are shade tolerant. Forest diseases and pests were becoming more of a problem as the trees, stressed by the additional competition from their neighbors, 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.

In keeping with the general notion of forest management, dominant during much of the time prior to 1975, the only interventions allowed by park managers were limited to those that resulted from periodic (ideally biannual) inspections for hazardous tree conditions in developed areas, where a specific tree presents a specific threat to a specific target. Typical mitigation measures included (and still include) moving the target (preferred, but rarely practical), treatment of the threat within the tree itself (e.g., thinning, or specific branch removal), or complete tree removal.

Aside from dealing with hazardous tree conditions, vegetation management within the park prior to 1975 consisted of protection of forests from disturbance, most particularly through the immediate suppression of wildland fires.

## B. Vegetation Management After 1975

### 1. Developed Area Vegetation Management

Approximately 110 acres of the park are developed (Figure 3), 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.

Both intensive human activity and the presence of artificial features have restricted vegetation management activities primarily to reduce risk through DPR's Hazard Tree Safety 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

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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. The overall goal guiding this program has been to create forest structures that roughly replicate that which might have been present if periodic fire exposure had not been interrupted.

## 2. Wildland Area Vegetation Management

### a. Prescribed Burns (Figures 4 & 5)

DPR began a program of prescribed burning at CBTSP in 1975, the first established by the department in any unit. These burns were conducted within the Calaveras South Grove with the intent of restoring fire specifically to the giant sequoia ecosystem and to (hopefully) stimulate reproduction of the species, which had been lacking since the cessation of a natural fire regime in the 1960s.

The initial burns 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, and with each burn planned for no more than five acres in size. However, within a few years the demonstration of safe practices allowed the park staff to increase the size of burns to proportions that matched their ability to manage the burns, typically in excess of 100 acres, and by 1981, virtually the entire grove had been burned.

Most of these burns included the consumption of significantly deep beds of decomposed biomass, known as duff. The advanced state of decay prevents the combustion of this fuel by open flame, and instead it is consumed by a very slow moving smoldering, which in turn produces exceedingly large amounts of smoke.

### b. Succession Management

By 1983, it became apparent that the re-introduction of fire, while valid as a management technique, 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 trees per acre (North, 2012), to sometimes nearly 400 stems per acre. This recognition caused the resource management program at CBTSP to shift from a primary reliance on fire as a restoration tool, to a 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, including incense cedar but mostly white fir that had 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 Cal Trans State Route 4 projects allowed CBTSP to restore over 120 acres 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 Conversancy continues to allow forest restoration efforts in the North Grove giant sequoia forest. Most recently, the resource management staff has utilized labor crews to perform a combination of thinning and prescribed 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. A prescribed burn would follow to consume forest litter and maintain gaps created during the manual treatment.

Labor crews include the State Parks Natural Resources crew, California Conservation Corps (CCC), and CAL FIRE/CDC inmate crews. These crews consist of an 8-16 person crew that work throughout the season (May

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– November). Crews complete between 1 and 5 acres of fuels reduction work (dependent on size of crew, fuel loadings, and skill level) in a two week period. This does not including burning the piles or removing large woody debris as more time needs to be allocated for this work. To date approximately 4,323 acres of the park has been restored. However, areas have not been maintained and have reverted to a pre-project level. Other locations have recently been restored and are in a "maintenance" level and should be included in the yearly maintenance plan.

### 3. Invasive Species Control

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

CBTSP has not been severely impacted with invasive plants in the past, although climate change may exacerbate this situation. 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. 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)*, and these 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. In the case of bull thistle, if the plants have gone to seed, then the additional step of clipping and bagging the flower heads must be taken. This particular plant 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 Program

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.

Original attempts at controlling WPBR relied on the fact that for part of its life cycle WPBR spores infect other plant genera, namely any members of the genus *Ribes*, such as gooseberries and currents. It was hoped that by extirpating this co-host the disease would be eliminated.

The threat to sugar pine is so acute that many agencies, including DPR at this unit, 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 various species of 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.

## VI. VEGETATION MANAGEMENT PLAN

In general, the vegetation management program at CBTSP can be divided into four areas. They are (in terms of overall program emphasis): succession management through thinning and/or prescribed burning; invasive species control; white pine blister rust management; and vegetation management in developed areas. The following goals and objectives are being proposed for both the developed and natural areas of CBTSP. The goals and objectives for the natural areas will be itemized by treatment methods.

The major, overarching goal of the VMP is to protect, preserve, and when necessary, restore the ecological processes that naturally manage the park's vegetative communities. Of these, the most important is the frequent occurrence of wildland fires, but others include such processes as storm damage, insect attack, and flooding. However, restoration of natural processes may not always be possible, and so a secondary goal is to, when needed, select and apply surrogate methods that mimic natural processes, recognizing that these surrogates (i.e. mechanical thinning) are typically equivalent in scope or impact as the natural processes they replace.

Finally, and especially as a result of the century and a half of fire exclusion from the park's environment, it is recognized that much of CBTSP's forested land, have been altered significantly in their structure and composition. Therefore, resource managers are now required to reverse these changes through manual or mechanical means.

As discussed above, the guiding program goal is to re-establish natural processes as called for in the policies and guidelines for natural resources, but in some cases the methods used to achieve this may require additional actions. Therefore, different areas of the park will require distinct arrays of management action. This plan has subdivided the park into management zones (Figure 7) defined on the type of forest management methods that are most appropriate for the area. These compartments are not directly related to the management units created for CBTSP's resource maintenance program.

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As much as possible, prescribed burning will be incorporated into each compartment's management techniques, but only in a few cases will it be the sole method, since the characteristics of most of the park's forested land has become so altered from the absence of fire that more aggressive actions must be taken to restore its stands to a composition and density more closely related to the resource managers' best estimate of what can be considered 'natural.' Once this restoration is accomplished the desired condition will be maintained, whenever possible, by periodic exposure to fire.

The preferred restoration method will be through the use of prescribed fire, coupled with, when necessary, the manual or mechanical thinning of the excessive stand density. In exceptional cases, and especially when the restoration requires the removal of large trees, mechanical thinning may be required.

The following management objectives are designed to achieve a forest that is in a state of "maintenance" level, which can be maintained through prescribed burning and some manual treatment, if necessary.

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

Maintaining a healthy, sustainable forest community at CBTSP requires that the unnatural influence created by over a century of infrequent or totally absent fires be eliminated. Therefore, all forest restoration activities will result in a return to a stand structure and age class distribution that represents an approximation of what might have been expected if a frequent fire return interval had been maintained over the past 100 – 150 years.

In general, the desired successional states are:

- Forest stand structure and density will vary across topographic gradients. The average density will be approximately 100-200 stems per acre but this number is highly variable. In drainages and riparian areas where fires historically burned less frequently and/or with less intensity stand densities and canopy cover will naturally be higher. Stem density will decrease over the mid-slope and will be the lowest on ridge tops. Stem density and canopy cover will be highest on northeast aspects and lowest on southwest facing slopes that will be dominated by larger fire resistant pines and oaks (North et all, 2009) (Figure 6).
- 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 course woody debris.
- Forest stands will be heterogeneous with multi story canopies and clustered with trees of interlocking crowns separated by sparse trees or open gaps of between ¼ and ½ acre in size, at a rate of approximately one per every 2-10 acres.
- 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 opening created by insects, disease, wind throw, and fire. Fire history analysis indicates that, without fire suppression, fires would burn the park about every 10 years.
- Giant sequoia groves will be maintained with prescribed burns and/or naturally occurring wild fires to prevent an overabundant regrowth of dogwoods and to create gaps necessary for giant sequoia regeneration.
- In areas where ponderosa pine and/or black oak are dominant, the removal of white fir will be given priority over all other species.
- The north grove meadow will be maintained by encouraging moisture retention and limiting the intrusion of woody species.
- 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.
- Riparian corridors will be given 50 foot buffer zones from both banks preserved as wildlife corridors and habitat for riparian species.
- Maintain current seral stages in grassland and chaparral populations.
- Control exotic plant populations within the park at current or lesser levels.

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- In developed areas the management plan will be the same as above with the further goal of improving public safety. The hazard tree program will continue to remove trees and snags that pose a threat to the public in campgrounds, picnic areas, and by structures.

### a. Plant Species of Special Concern

#### i. Giant Sequoia

Calaveras Big Trees State Park might never have been established if it were not for the presence of this iconic species, and as such it warrants a level of attention that is not provided other species. Concern about the status of the tree's reproduction and recruitment has already been expressed and integrated into other sections of this plan, but beyond that resource managers must include other activities that have yet to be elucidated in this plan. Most of these activities 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

#### ii. Pacific Yew

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) 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 yew population concentrations of 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 populations

#### iii. 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. CBT 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 flowing 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, if fuel conditions indicate a threat.
- No entry by mechanized equipment will be allowed onto the sensitive surface of suitable L. stebbensii habitat for any reason, at any time.

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## B. Treatment Management Zones

The range of management actions that are suitable for vegetation management actions, especially forest restoration work will not always be appropriate for any particular portion of CBTSP. The park has therefore been divided into allowable treatment zones (Figure 7). It should be noted that these designations are based on best available current information, and that subsequent new data may require a revision to this plan (and a renewed environmental review). Following is a description of the allowable actions by zone.

**Zone 1 – Limited Use of Fire**

In general, this treatment zone is most specifically designed to limit the generation of smoke that might impact smoke-sensitive areas. Such areas include the State Route 4 corridor, the two family campgrounds, and the group campground. While fire is not prohibited in this zone, its use should be limited if it might impact public safety. Fires that are likely to produce little or no smoke at night will be allowed. Otherwise, manual and/or mechanical methods will be used.

Pile burning and small broadcast burns may be used, but only with great caution.

**Zone 2 – Prescribed Fire after Manual/Mechanical Thinning and Fuel Reduction**

These areas typically have sufficient fuel loads that prescribed fire, and the resultant smoke generation, will require fuel reduction before any use of fire can be considered. However, overnight burning and smoldering may be possible.

**Zone 3 – Prescribed Fire and Manual/Mechanical Thinning**

Depending on conditions, treatments in these areas may utilize any treatment option, in any order, depending on local conditions and opportunities. They are generally far from smoke sensitive areas, and have no other limitations based on site-specific sensitivities.

**Zone 4 – Prescribed Fire Only**

These areas are usually those that have been restored to the extent that they have entered into a maintenance mode, or their current condition is such that no significant alteration to stand conditions is required through manual or mechanical means.

**Zone 5 – No On-Ground Mechanical Entry**

No-entry areas are those that have significantly sensitive conditions or resources that preclude the use of mechanized and on-ground equipment. These include the South Grove Natural Preserve, and steeply sloped river canyons.

**Zone 6 – Localized Site-Specific Treatments**

Such areas are essentially limited to historic and archaeological sites and areas where Stebbins' lomatium occur. Any treatment actions in these areas should be very limited and benign, or be excluded entirely.

It should be noted that, as management actions proceed, the boundaries of some of these zones may shift into more conservative, less disruptive management techniques. The ultimate goal of this plan is to have the majority of CBTSP in Zone 4, where maintenance can be achieved through the use of fire alone. The Central Valley District Senior Environmental Scientist or designee will be responsible for re-defining these zones, as needed.

## 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. In order of preference, these methods are:

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## 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 on a regular basis, and in such a way as to reflect the range of fire behaviors that would have occurred naturally. 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. This will vary along topographical gradients. North facing slopes and valley drainages will have longer fire interval return rates with less intense fire behavior while south facing slopes and ridgetops will burn more frequently.
- Conduct 95% of all burns in late summer to early winter. Any burns planned outside of this time period will be small in size and likely limited to pile burning.
- Burn units will be inspected prior to ignition to identify old growth trees, especially sugar pines and giant sequoias that might be severely damaged by fire. The risk will be mitigated by raking duff layer away from the trunk of the tree and spreading that duff evenly to prevent thick pockets that could burn hot and damage root systems. Ladder fuels that may ignite during the burn and surround old growth sugar pines and giant sequoias should also be removed and piled in a safe location.
- A primary objective of any burns conducted within giant sequoia groves will be the stimulation of seed release, to be observed through monitoring.
- Allow for the creation of interior gaps through localized pockets of higher intensity fires.
- Avoid the reuse of temporary control lines and the establishment of permanent burn units.
- Avoid disturbing known archaeological or historic sites, and/or making them more obvious to the public.
- Use best available smoke management techniques.
- Take advantage of burns as training opportunities for DPR personnel.
- Prescribed burns shall be conducted within the guidelines established by DPR.
- Although other agencies may assist in implementation, DPR personnel will always take the lead in planning burns and directing ignition, with the following exception: DPR 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.

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- For ground based ignition, burn projects should be no more than 240 acres in size, unless fuel conditions can assure safe but rapid spread.
- 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 should either be a segment of a series of contiguous units to be treated as a whole, or as a training burn.
- Whenever possible, wet lining will be used as an alternative to hand line construction.
- Burns that are not achieving desired effects will be discontinued or suppressed.
- 100% coverage by fire is not desirable and will not be sought by fire managers.
- General Prescriptions: A prescribed burn prescription establishes ranges of allowable environmental conditions that will provide the type of fire behavior likely to have minimal escape potential on one hand, and likely to also achieve the desired results to vegetation and plant communities. Experience has shown that the following two models are the most reliable. The first is mostly useful in areas with heavy fuel loadings (and likely higher fire intensities), while the second has been used in areas with low fuel levels (and likely lower fire intensities).

    i. <u>Model 1- Heavy Fuels</u>
    - Temperature……50-80 F
    - Relative Humidity……30%-60%
    - Mid Flame Wind Speed…….....Less than 10 MPH
    - 10 Hour Fuel Moisture……9-15%

    ii. <u>Model 2- Lighter Fuels</u>
    - Temperature……50-80 F
    - Relative Humidity…… 25%-60%
    - Mid Flame Wind Speed……..Less than 10 MPH
    - 10 Hour Fuel Moisture……8-13%

### 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 damage or destroy root structure and allow flames to reach the canopies of old growth pines and giant sequoia. Therefor 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. Manual thinning with pile burning

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. Experience has shown that manual thinning is very effective for trees four inches in diameter at breast height (dbh), and moderately effective for trees from 4 to 8 inches dbh (10 to 20 cm). 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 thinning will be less than 14” dbh, 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 VI.A. Thinning of the forest understory and reduction of surface fuels will reduce potential fire intensity and risk of crown fire.

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Manual Thinning Projects will:

- Retain all old-growth trees except hazards to human life, facilities, or firelines.
- 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.
- Thin trees 14" to 30" dbh very selectively within the scope of hand crew capabilities.
- Thin live trees 8" to 14" dbh selectively to achieve desired forest structure.
- Retain defect trees (decadent, broken topped, or malformed). These trees are the most important habitat for wildlife species.
- Retain all trees with nests or with evidence of recent animal use.
- Thin second-growth trees from around pine and hardwood species to provide sunlight and growing space for preferred species.
- Adjacent to riparian and hardwood areas, remove or thin encroaching conifer as feasible to promote riparian and hardwood vegetation.
- Retain intermittent dense clumps of small trees approximately 25 to 75 feet across in size with approximately 100 to 300 feet spacing between clumps. Size and shape of retained clumps should be irregular and variable.
- In burn pile areas, cleanup surface fuels 1" to 14" diameter by limbing, bucking and piling for burning.
- Retain logs greater than 14" diameter. Naturalize the appearance of logs to be retained by underslashing cut ends. 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 to achieve a balance between fire fuel and wildlife habitat.
- Pile the cut brush into many smaller piles 4'x4', or by elongating piles (windrows), ideally directly up and down slope. Such an arrangement would allow subsequent burning by igniting the pile at the top, and letting it slowly back down along its length.
- In giant sequoia stands, slash will always be burned on site, and in such a manner as to create sites suitable for giant sequoia regeneration and recruitment. Specifically place piles so that rising heat will reach cones and aid in seed dispersal. Also place piles on the south side of the old growth giant sequoia with the goal of creating patches cleared to mineral soil with sun exposure necessary for giant sequoia regeneration.

### 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, then 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.

CBTSP now owns a trailer mounted incineration device called the Burn Boss. This unit burns biomass efficiently at high temperatures greatly reducing emissions. For projects bordering dirt roads it may be preferable to use the Burn Boss for the accessible slash piles. The incineration unit technology has progressed rapidly and is becoming the chosen method for burning of biomass to reduce air pollution. It is likely that eventually the Burn Boss will be permitted for use on days that open pile burning will not. If this comes to pass this unit and others like it will be necessary tools in dealing with the excessive fuel loading at CBTSP.

### e. Mechanical thinning and removal of large trees

Although the use of manual methods of forest restoration is preferred, it is recognized that the efficiency of such work is severely impacted when used to remove large trees, considered to be any with a diameter at breast height of greater than 12" (30 cm.). 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

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practical when it is near roads. If many trees need to be removed then mechanical thinning should be considered subject to the following provisions:

- Large tired vehicles will always be specified and the operation of such equipment will be limited to slopes of less than 20%.
- Tree boles will not be dragged across the ground, but carried out in such a ways as to prevent damage to other trees.
- The use of feller-bunchers and log transporters are preferred to operations that require skidding.
- Soil disturbance is to be avoided and, if it occurs, mitigated and restored at the end of the operation.
- Landings will be allowed only in previously disturbed areas of low sensitivity.
- Cleanup will include either full removal, or pile and burn of the vegetative debris.
- Mechanical operations will only be allowed when needed to achieve a desired stand density, and will always be considered as a one-time-only operation.

Currently, the Central Valley District lacks the type of equipment required for mechanical thinning and typically this work would need to be contract out. If contracted thinning is anticipated, it will be under the direction of a State Park environmental scientist and/or forester. A State Park representative will monitor the daily activities of the entire operation. In very sensitive areas, such as the South Grove Natural Preserve, no ground entry of mechanized equipment will be allowed, and only helicopter operations will be permitted. Funds resulting from the sale of removed trees will first be used to offset the costs of conducting succession management operations within the park, then to offset costs of natural resource management projects at CBTSP.

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, determined by aspect and topography.
- Overstory Tree Spacing Target: 10 to 30 feet, and clumps with tighter spacing and interlocking branches.
- Retain all old-growth trees except hazards to human life, facilities or firelines.
- Thin second-growth trees within dripline of old-growth trees and within potential dripline 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.
- Thin live trees less than 14” dbh to 10 to 30 feet spacing, favoring tree size and health, and pine and hardwoods over fir and cedar.
- Retain intermittent dense clumps of small trees approximately 25 to 75 feet across in size with approximately 100 to 300 feet spacing between pockets.
- Retain intermittent pockets of heavy surface fuel loading (course woody debris and logs with a congested arrangement) approximately 25 to 75 feet across in size with approximately 100 to 300 feet spacing between pockets.
- 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.

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- Snag (dead tree) retention/recruitment target: 3 to 12 per acre.
- Snag minimum size: 14 inches diameter and 20 feet height.
- Retain/recruit snags with largest relative diameter or with evidence of prior animal use.
- Retain defect trees (decadent, broken topped, or malformed). These trees are the most important habitat for wildlife species.
- Downed log retention/recruitment target: 3 to 12 per acre.
- Downed logs to be retained will be left intact, with all limbs and root wads protruding to provide wildlife habitat complexity.

#### f. Girdling

If only a few trees need to be removed from a stand and 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" dbh). Girdled trees will have the bark removed in a continuous circle, effectively killing the tree. The cut area should be rough and uneven avoiding the straight lines associated with mechanized tools. Girdling will not be carried out in areas where the resulting snag will pose a threat to visitors or Park facilities.

### 2. Invasive Species Management

CBT has remained relatively free of troublesome exotic plants and animals. Only two plant species are of ongoing concern (bull thistle and common mullein). Three other plant species have been observed in or near the park: yellow-star thistle, scotch broom, and sweet white-clover.

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

- Eradicate populations of bull thistle within three years of identification.
- Keep common mullein populations contained within existing known locations.
- Develop a map for CBT 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 at least 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 CBT.
- 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.

#### a. 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.

#### b. Prescribed fire

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

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**c. 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.

**d. 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. However, the application of herbicides should not be resolutely prohibited, but instead should be considered with great care, and used only when the progress of forest restoration efforts is threatened by the inability of resource managers to use more acceptable tools. Any use of herbicides will only be acceptable if application is carried out by hand and limited to direct application to target species, rather than through broadcast spraying. Furthermore, the use of herbicides will only be considered after review of a separate and specific review under CEQA.

## 3. White Pine Blister Rust Program

Essential to the effort of CBT 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 an equally long-term commitment of resources to achieve results that may not even be identifiable for decades. The current program is essentially dedicated to the accumulation of resources (i.e., 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.
- At least biennially, review that status of the entire population of sugar pines at CBT, and, in consultation with DPR foresters and other experts in the field, determine if plantings of resistant trees should be undertaken.
- The collection of cones from resistant trees will be done solely by climbing, and 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 visual obtrusiveness.
- 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 earlier, CBT 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. It is hoped that this seed reserve will allow the park to at least respond effectively if mortality to sugar pines by WPBR worsens to the point that the natural population is

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threatened, or if wildfires destroy large stands of sugar pine. Beyond that, CBT resource managers should give consideration to a more proactive program if deliberately expanding the number of resistant trees throughout the park, especially in areas where the pollen cloud released by mature specimens will spread the furthest, as on ridgetops.

Protection of Rust Resistant Trees include:

- Annual inspections of resistant trees will be made 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.

### 4. Developed Area Vegetation Management

A developed area is defined as "any land which has been altered or improved for public or administrative use." There are many types of developed areas in CBTSP including campgrounds, picnic areas, scenic overlook, trailhead parking, visitor center and administrative buildings (Figure 3). Most of these 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. Due to their tendency to fail catastrophically, white fir will not be a preferred species in developed areas, and individual trees will be removed at any sign of decline.

Outside of this tree length buffer zone the developed area effectively ends and the vegetative community is managed according to the same treatment methods mentioned above.

## D. CONTRAINTS 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's 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 (Figure 8) and possible problems from smoke will be discussed in the plan. Actions for dealing with such problems will also be addressed.

Since prescribed burning will reduce fuel hazards, subsequent wildfires should be more easily controlled and, in the end, result in less smoke from any given area of land. Still, 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. 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. The Calaveras and Tuolumne

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County APCDs regulate cumulative impacts by issuing allocations on a daily basis. Agencies planning and managing burns must be cognizant of the fact that smoke is one environmental aspect of the burning program that is most likely to incur public concern and result in calls to the local APCD.

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 done when the fuel moisture stick readings are in 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 downslope:*** This results in smoke particle size smaller than that from a fire burning fast upslope; hence, the lessened visibility of the smoke. It also slows the rate of combustion, so that less smoke is being generated at any one time.

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

***h. Termination of the burn if smoke behavior is undesirable:*** After all of the above techniques have been used, this may be the only recourse.

Smoke sensitive areas are found in and around CBTSP and the smoke sensitive areas within 10 miles of CBTSP are illustrated in (Figure 8). Examples of smoke sensitive areas are populated areas, traveled roads or highways, airports, hospitals, schools and their potential as targets for smoke impacts vary 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. 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

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located within 3 miles 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 contains no adjacent smoke sensitive areas. The South Grove Trail is lightly used by visitors and there are no public roads. Still, 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 1975-2012 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.

### 2. Wildlife

Successful 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. Still, it is to some degree likely 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. 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. 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 bat and bird species 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. Treated units should not have a “clear cut from below” condition.

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 made 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 as 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

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reasonable 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.

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 minimal impact on cultural sites. Prior to any vegetation management activity, the project manager will work with a DPR cultural resource specialist in locating and delineating cultural sites and deciding what protective measures are needed. 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 will 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 (e.g., hand lines, flagging, etc…), will be removed.

### 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 (signage, 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.

### 5. 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. Mitigation activities 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 lomatium (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 wetlines 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. In addition, efforts should be made to protect giant sequoias from excessive charring of the bark, especially in areas of high public use, and to prevent fire from entering tree cavities.
- For black oaks, which have been succeeded by coniferous species, protection during prescribed burn treatments is required. During thinning treatments, creating openings around large oaks that are prolific seed producers will favor regeneration. However, thinning around oaks with

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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 all, 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 pines, care should be taken to prevent the exposure of tree bases to prolonged exposure to heat. Experience has shown that these trees are especially vulnerable to damage – and perhaps mortality – when a decades-long buildup of duff and litter around their trunks is allowed to smolder for several hours, allowing 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. Post-Fire Exotic Species Colonization

Any fire, whether natural or human-caused and regardless of intensity, is an ecological disturbance, and as such it provides an opportunity for invasive exotic species to become established. Currently, bull thistle is the one species most likely to be found in burn units post-treatment, especially in portions of high intensity consumption. It is essential that post-treatment inspections for thistles are conducted in the late spring or early summer for at least two years after the area has been declared thistle-free.

### 7. Scorch Control

Tree scorch is defined as the foliage that has been killed by convective and radiant heating from fire. This effect is particularly common on lower branches, where leaves or needles are close to the flaming front of a fire, and to a certain extent, foliar mortality is beneficial to the tree itself, when limited to the lower branches, since it has the effect of pruning the tree and reducing the potential for more intense fires to "crown" through the canopy, an event that is more likely to result in the death of the tree.

Heavily scorched trees, and particularly conifers, although not killed by fire initially, may be greatly weakened and thus predisposed to beetle attacks which result in mortality. In addition, conifers at CBTSP are not equally resistant to scorch induced mortality, while ponderosa pine, incense cedar, and giant sequoia are generally tolerant, white fir and sugar pine are especially sensitive to crown reduction (Stephens and Finney 2002).

The control of tree scorch is especially desirable from the aesthetic standpoint in scenically sensitive areas, including campgrounds, picnic areas, residential and administrative areas, and within roadside corridors. Scorch control for aesthetic reasons is a subject that is closely related to the question of the management of prescribed fire in and adjacent to developed areas and other areas considered scenically sensitive, including roadside corridors. In general, however, the control of fire intensity in such areas is also desirable from the standpoint of overall fire management, since these areas typically occur near, or in fact are, part of the fire perimeter, where reduced intensities are key to preventing escapes across containment lines. Within the interior of burn units, however, small areas of higher intensity are a necessary part of replicating natural fire behavior, and are required to create favorable conditions for long-term forest management, by creating gaps in the forest structure that will allow for subsequent tree regeneration. This is especially important for the management of giant sequoias (Demetry 1995; Demetry and Duriscoe 1996; York et al. 2010).

Managing scorch can be achieved in several ways: burn prescription design, burning technique, and pre-burn site preparation. Attention to the prescription variables, including flame length, ambient air temperature, and wind speeds can assist in reduction of scorch. Crown scorch height, fireline intensity, and flame length are closely related. In fact, flame length is as a measurement of fire intensity, therefore, the longer the flame length, the more intense the fire, and the greater the exposure of the canopy to heating.

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Flame length is influenced by the type of fuel and its relative flammability, and directly correlated with the rate of energy release during combustion. This rate, in turn, is inversely related to the moisture content of the fuel being consumed: the dryer the fuel, the more rapid the release of energy, and the longer the flame length.

There are special situations that may require intensive site preparation in selected areas in order to prevent heavy scorching and damage to the resource. Such advance site preparation is especially important before initial burns in areas where fire exclusion has allowed the buildup of excessive wildland fuels. In such areas, the removal of fuels away from important trees is justified.

### 8. Char

Char is defined as the carbonization of plant tissue. Char on tree stems has a direct effect on aesthetics and is an indirect indicator of the amount of heat and scarring at the base of the tree.

Char control objectives may be set forth in prescribed burn project plans. The factors which determine char are similar to those which determine scorch, and the discussion in that section shall be used as guidelines in setting these objectives.

### 9. Soils and Slope

All soils at CBTSP are experiencing erosion to varying degrees. In some cases, erosion could be considered natural, such as soil creep and runoff from steep slopes and coastal wave erosion. 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. Mitigation measures could include water barring and covering of fire lines and abandoned roads. Monitoring may measure erosion rates in the burn site. Burn prescriptions in particularly sensitive areas might provide for fires less intense than normally used in that fuel type, or provide for duff moistures that would have a protective ground cover.

### 10. 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.

## VII. COMMUNITY RELATIONS and PUBLIC EDUCATION

Ever since DPR began its prescribed burn program at CBTSP, resource managers had recognized the need to offer the public – both parks visitors and in the surrounding community – 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 considered to be an essential part of their work, and should continue into the future.

## VIII. 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 report the forests of CBTSP have evolved with regularly occurring lightning caused wildfires. More recently human caused wildfires have grown to record breaking

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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 the 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 (roughly 10 years). If however the 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?

## IX. REVIEW AND APPROVAL

Long term vegetation management plans do not have a termination date and consequently they must be thoroughly and periodically reviewed. Furthermore, as new science emerges resource staff must adaptively manage to incorporate new relevant scientific information

- All plans must be recommended by the District Natural Resource Manager and the Chief of Natural Resources Division.
- If the plan includes an element on historic vegetation management than it must be recommended by the District Cultural Resource Manager, and the Chief of Cultural Resources Division.
- If the plan involves significant manipulations of the native wildland forest/woodland tree canopy, the plan must be recommended by a Department employee with a Registered Professional Forester's License

All plans must be approved by the District Superintendent.

## X. 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 and California spotted owls. If projects are to impact meadow or riparian areas then surveys for great grey owls, willow flycatcher, and amphibian species 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.

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### 3. Post-Project Surveys

On top of 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. Fore prescribed burn treatments, erosion rate will also be monitored.

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## XII. APPENDICES

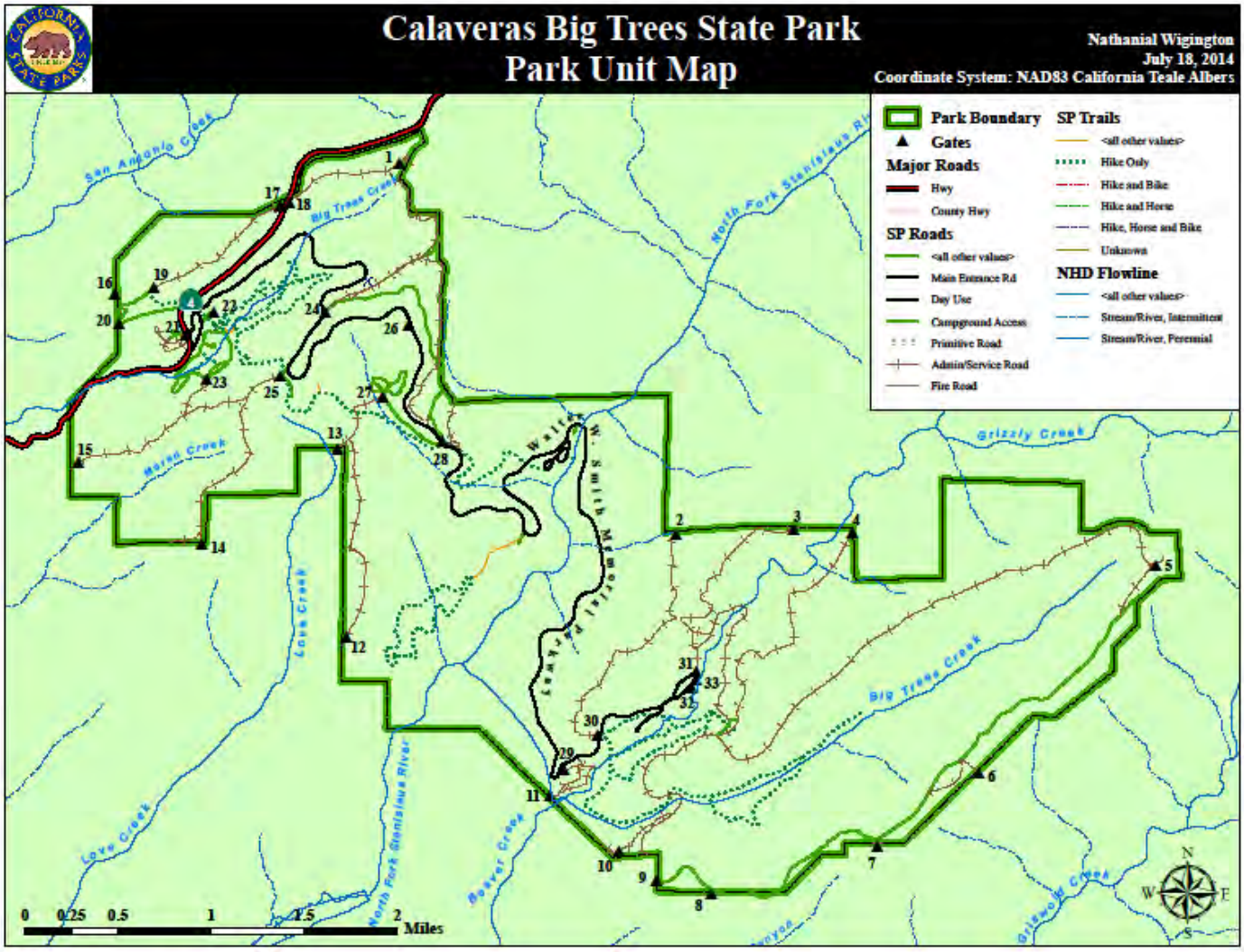


**Figure 1.** Map of Calaveras Big Trees State Park (CBTSP)

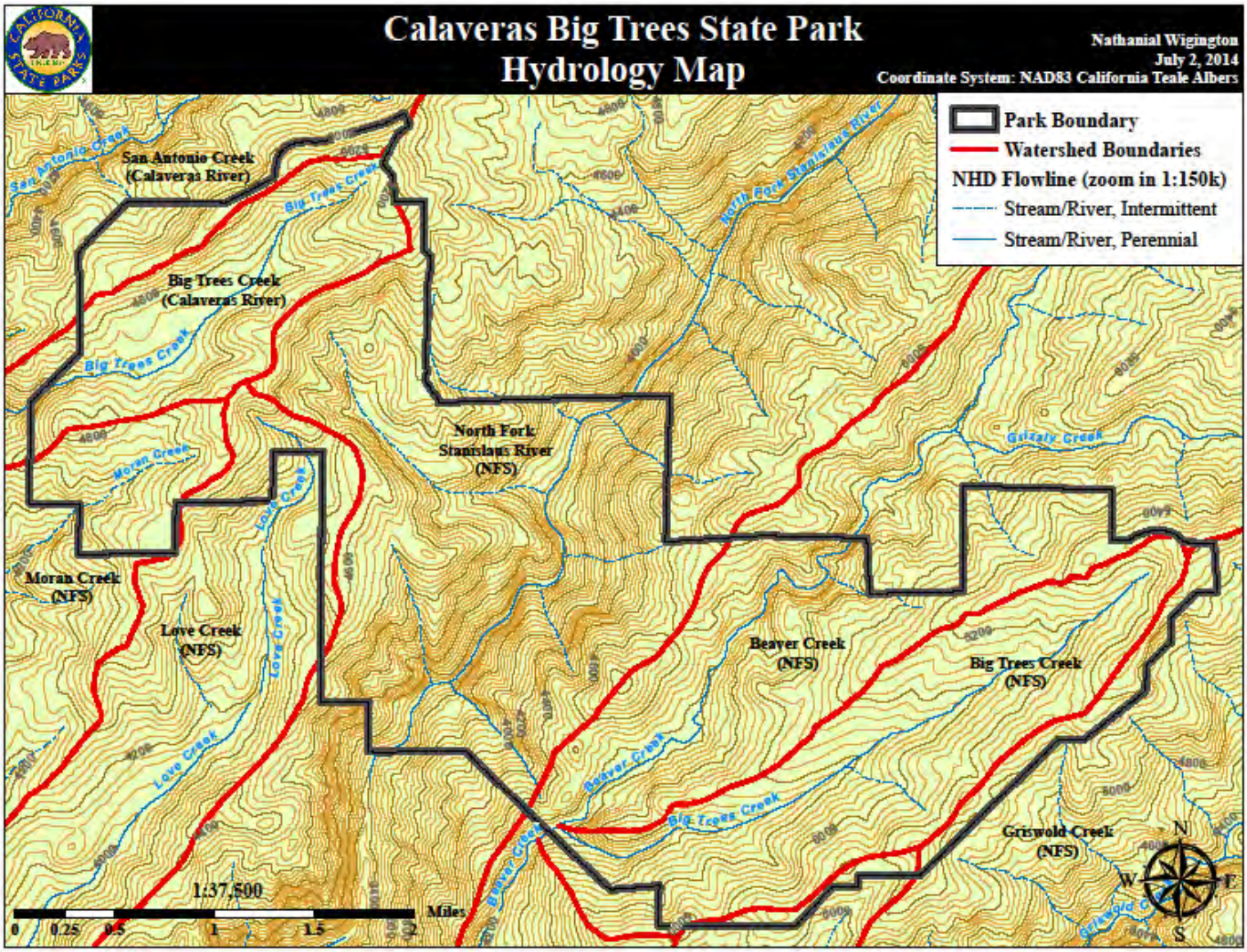


**Figure 2.** Watershed map of CBTSP.

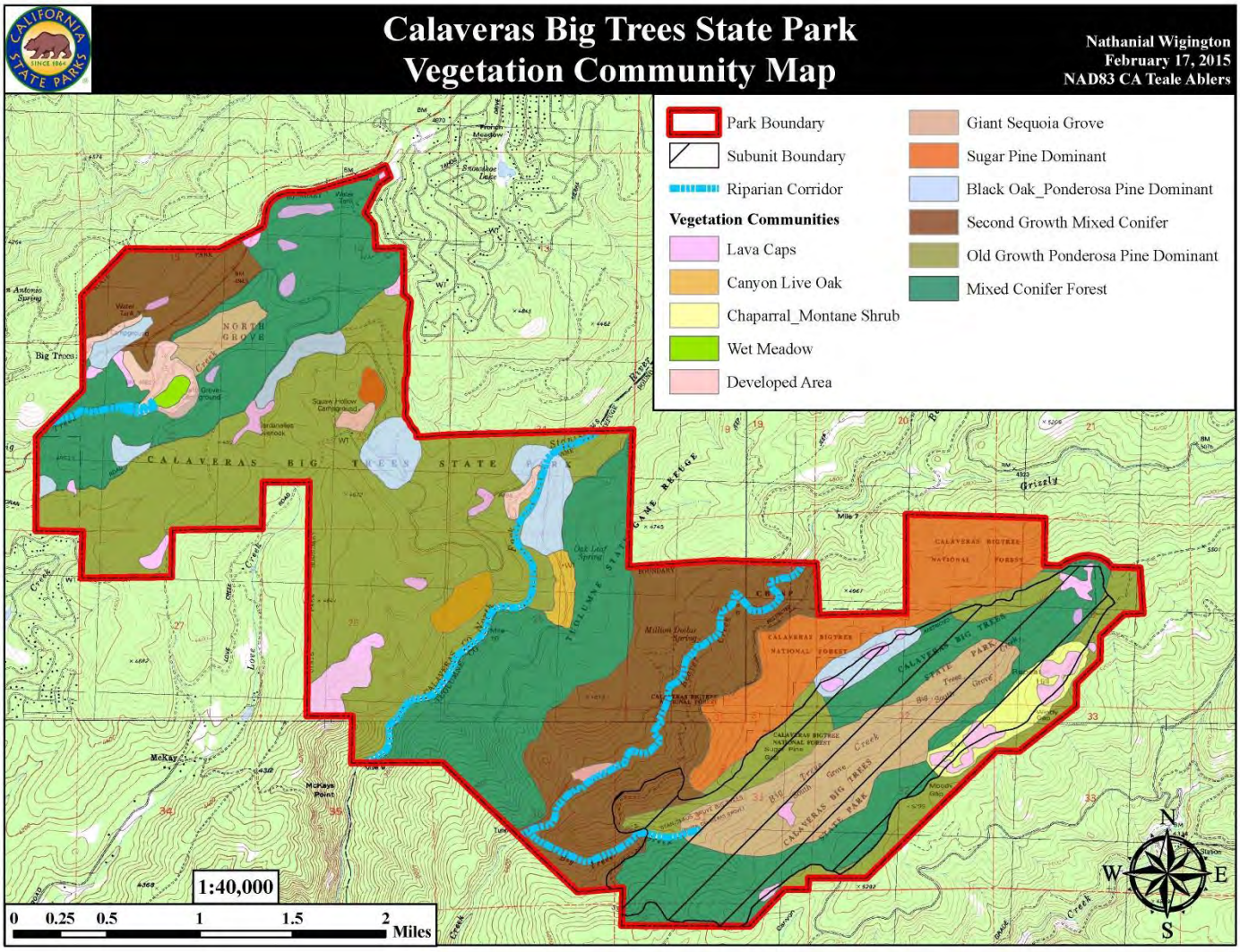


**Figure 3.** Vegetation community map including developed areas for CBTSP.

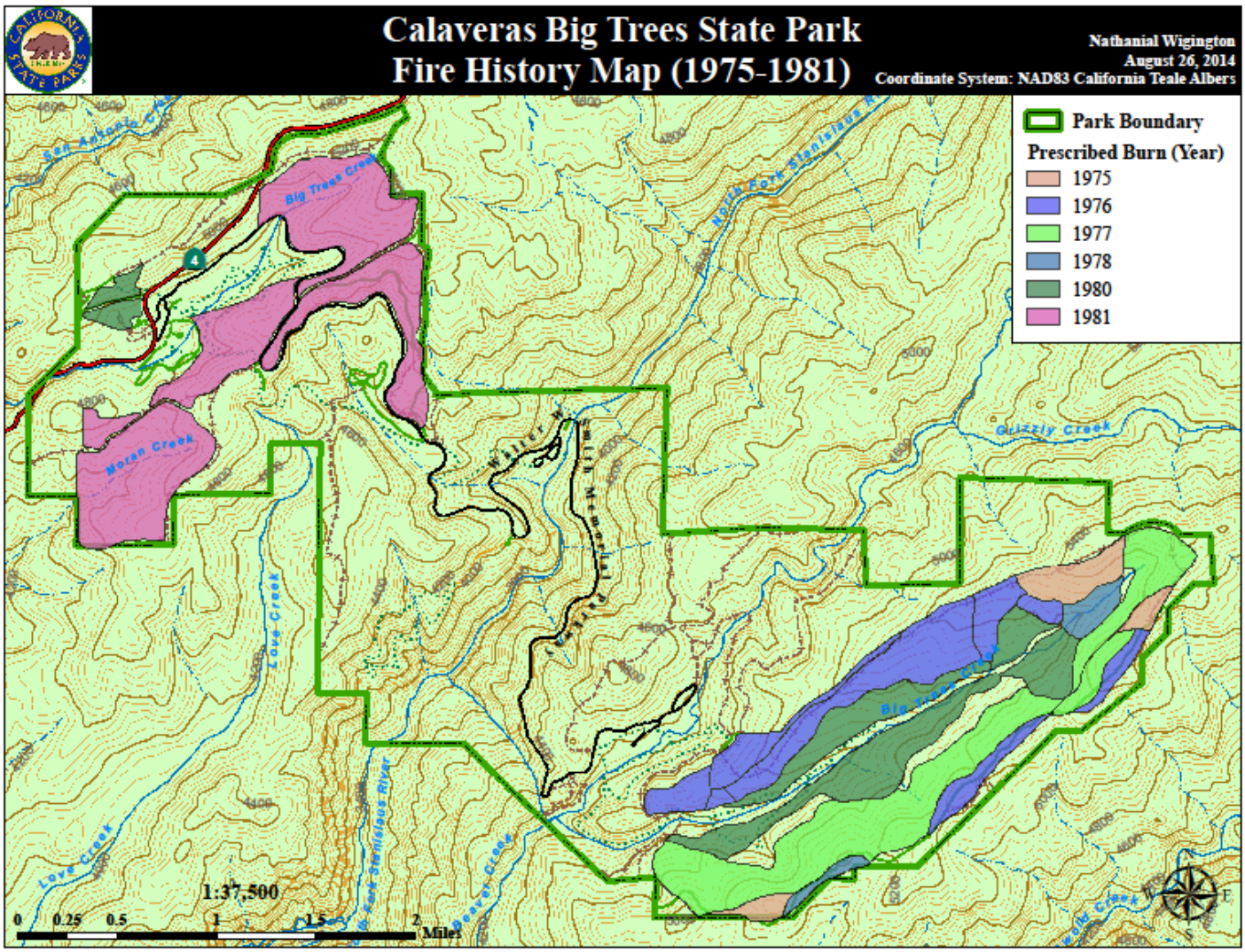


**Figure 4.** Fire history map of CBTSP 1975-1981.

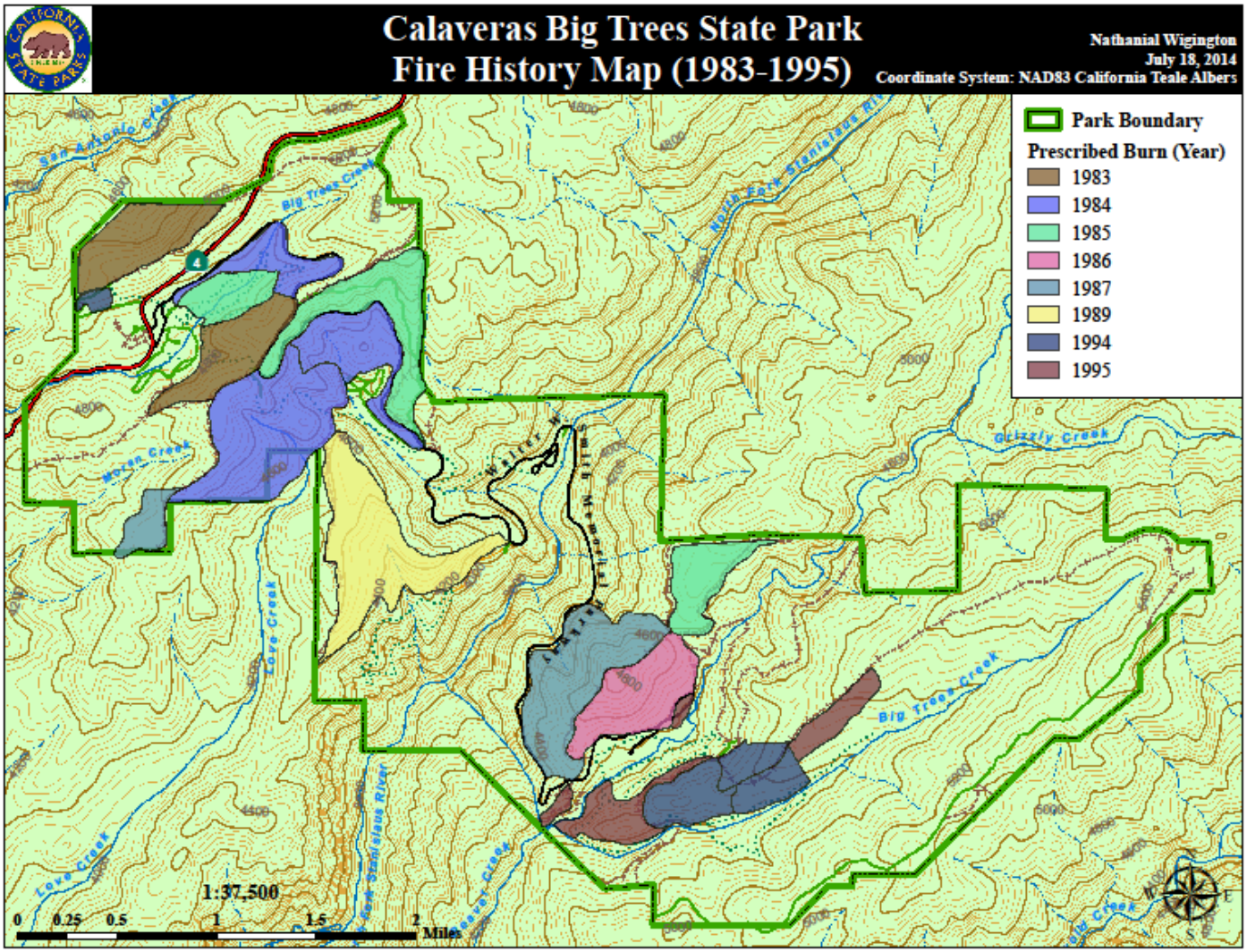


**Figure 5.** Fire history map of CBTSP 1983-1995.

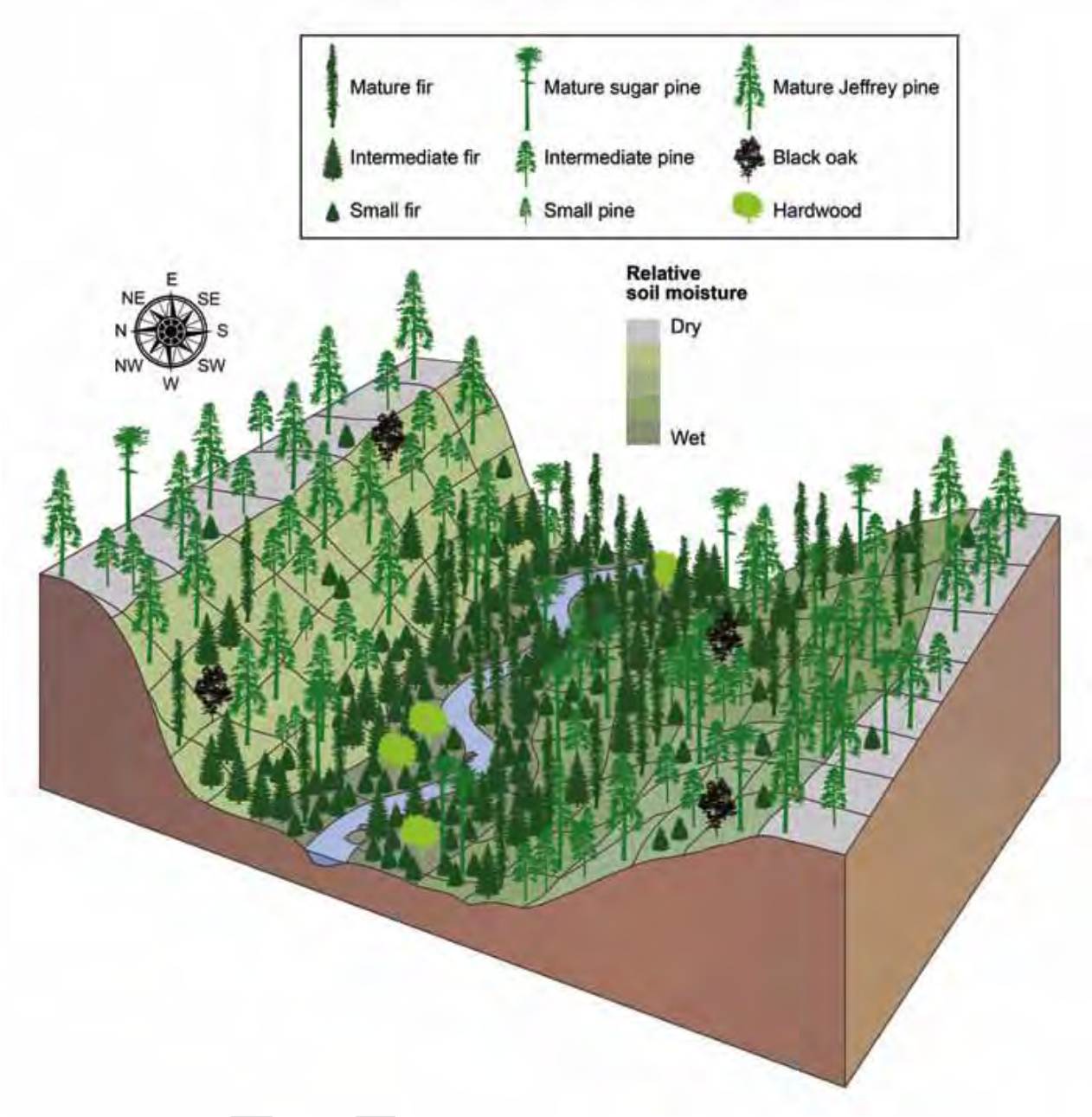


**Figure 6.** Landscape schematic of variable forest conditions produced by management treatments that differ by topographic factors such as slope, aspect, and slope position. Ridgetops have the lowest stem density and highest percentage of pine in contrast to riparian areas. Midslope forest density and composition varies with aspect: density and fir composition increase on more northern aspects and flatter slope angles (North et all, 2009).

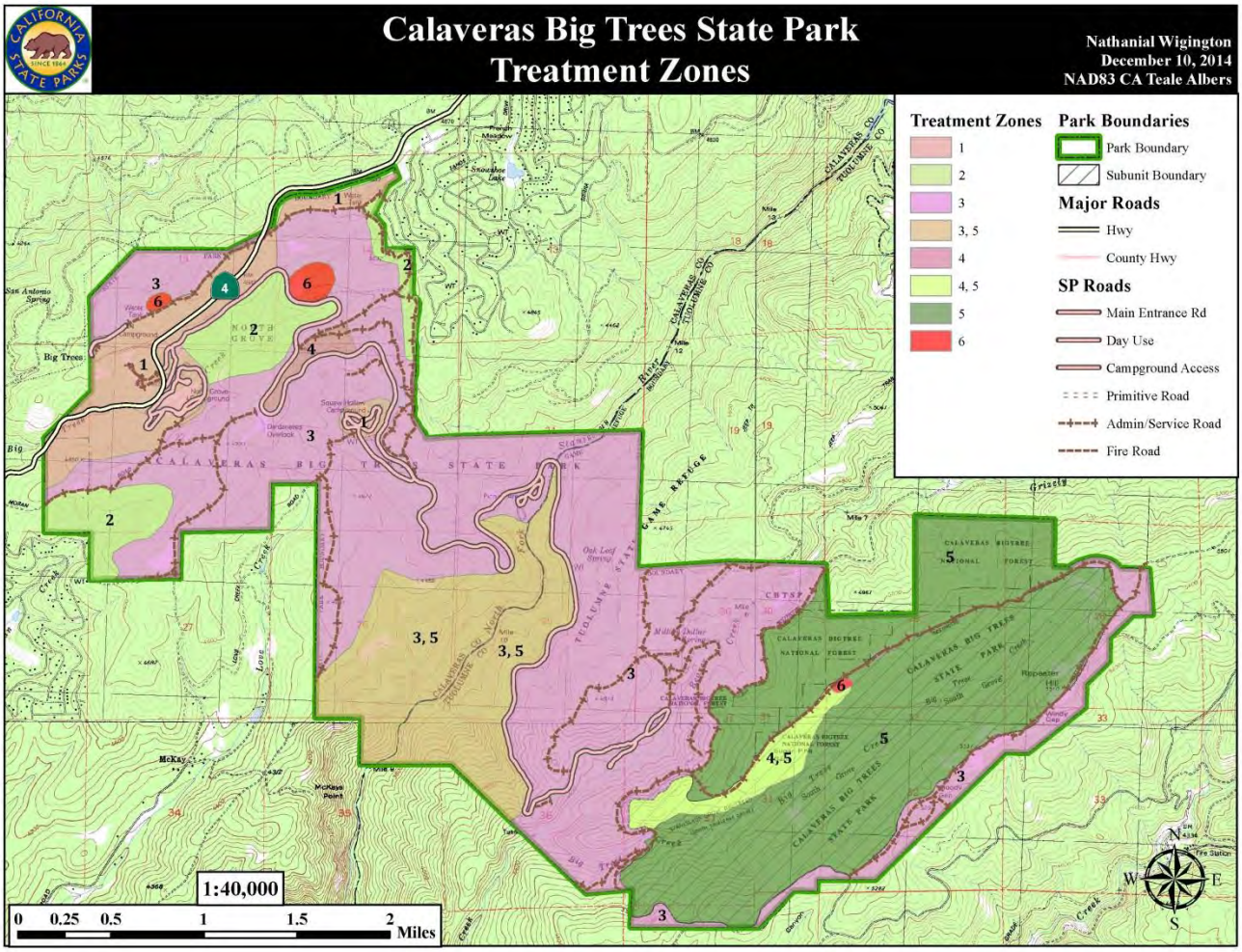


**Figure 7.** Vegetation treatment zones for CBTSP.

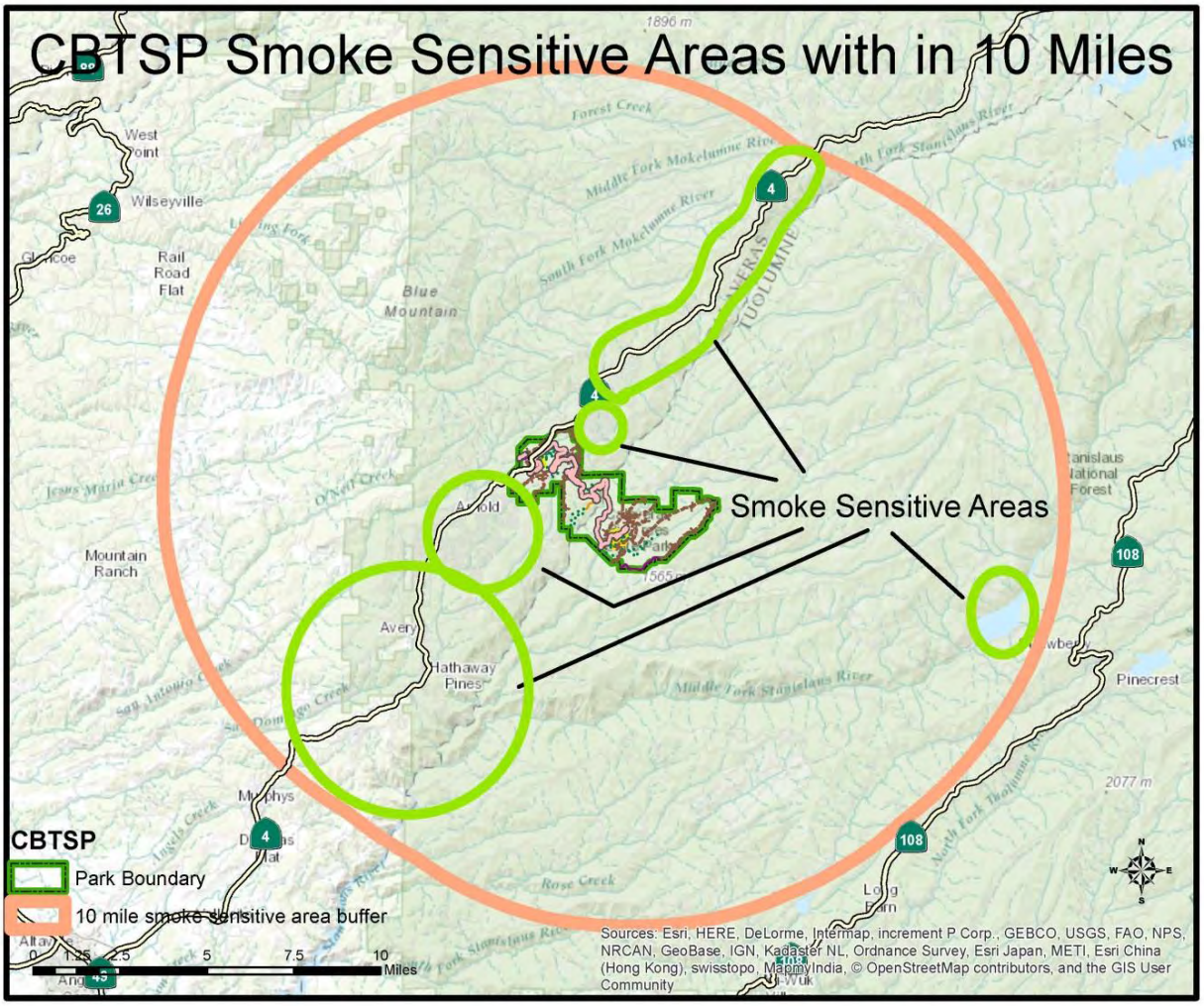


**Figure 8.** Smoke sensitive areas within 10 miles of CBTSP.

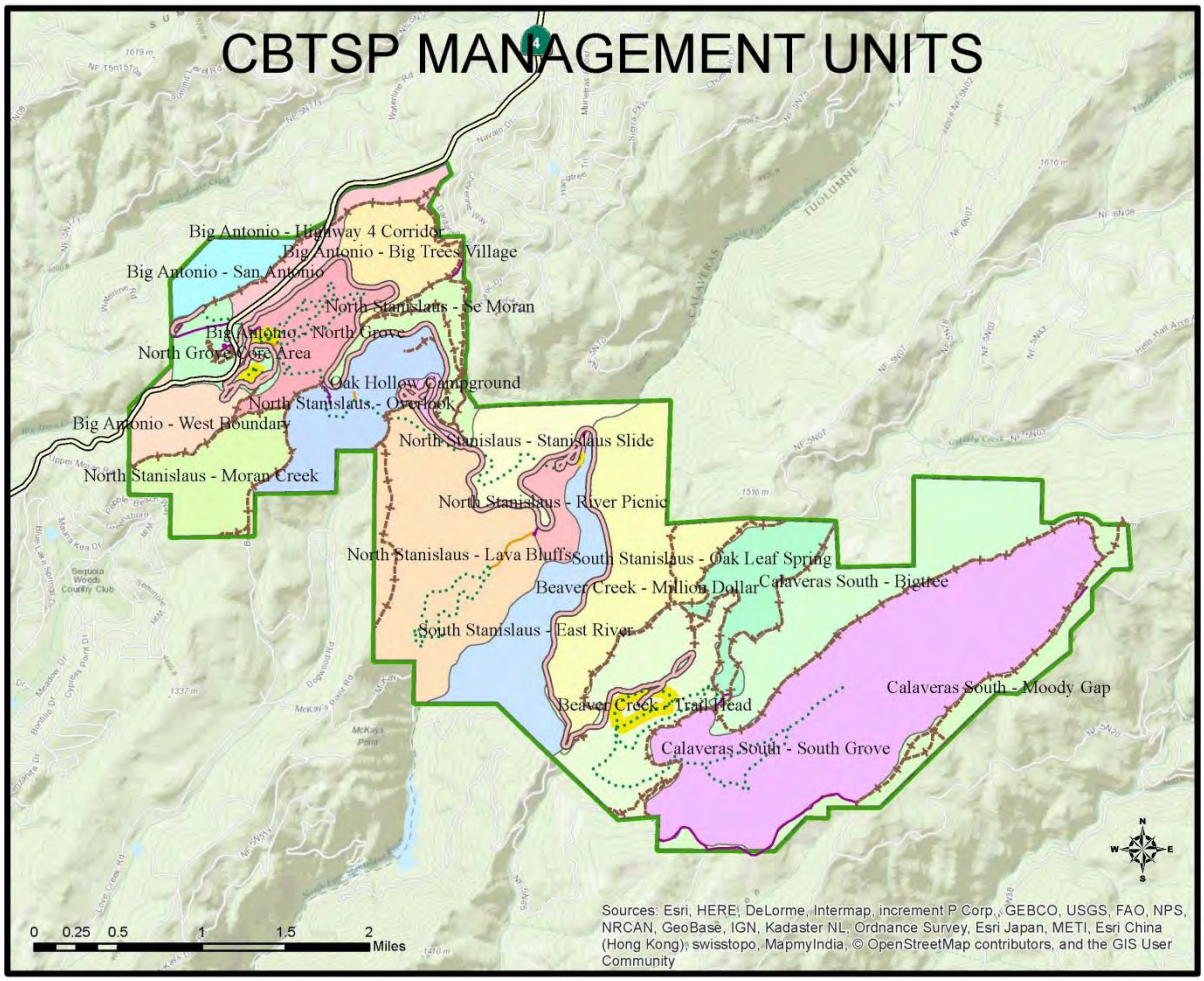


**Figure 9.** CBTSP management units.

## Appendix F - CEQA/NEPA Compliance Form

(California Environmental Quality Act & National Environmental Policy Act)

*Instructions: All applicants must complete the CEQA compliance section. Check the box that describes the CEQA status of the proposed project. You must also complete the documentation component and submit any surveys, and/or reports that support the checked CEQA status.*

*If NEPA is applicable to your project, you must complete the NEPA section in addition to the CEQA section. Check the box that describes the NEPA status of the proposed project. Submit any surveys, and/or reports that support the NEPA status. For both CEQA and NEPA, submittal of permits is only necessary if they contain conditions providing information regarding potential environmental impacts.*

*NOTE: Effective July 1, 2015, AB52 compliance is required.*

### CEQA STATUS
### (All applicants must complete this section)

*Check the box that corresponds with the CEQA compliance for your project. The proposed action is either Categorically Exempt from CEQA, requires a Negative Declaration, Mitigated Negative Declaration, or an Environmental Impact Report per CEQA.*

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### ☑ Categorical Exemption or Statutory Exemption

*If a project is exempt from CEQA, all applicants, including public agencies that provide a filed Notice of Exemption, are required to provide a clear and comprehensive description of the physical attributes of the project site, including potential and known special-status species and habitat, in order for the SNC to make a determination that the project is exempt. A particular project that ordinarily would fall under a specific category of exemption may require further CEQA review due to individual circumstances, i.e., it is within a sensitive location, has a cumulative impact, has a significant effect on the environment , is within a scenic highway, impacts an historical resource, or is on a hazardous waste site. Potential cultural/archaeological resources must be noted, but do not need to be specifically listed or mapped at the time of application submittal. Backup data informing the exemption decision, such as biological surveys, Cultural Information Center requests, research papers, etc. should accompany the full application. Applicants anticipating the SNC to file an exemption should conduct the appropriate surveys and submit an information request to an office of the California Historical Resources Information System (CHRIS).*

1. Describe how your project complies with the requirements for claiming a Categorical or Statutory Exemption per CEQA:
   The project has been filed using Classes 1 & 4, Sections 15301 & 15304. See CEQA documentation for further information.
2. If your organization is a state or local governmental agency, submit a signed, approved Notice of Exemption (NOE) documenting the use of the Categorical Exemption or Statutory Exemption, along with any permits, surveys, and/or reports that have been completed to support this CEQA status. The Notice of Exemption must bear a date stamp to show that it has been filed with the State Clearinghouse and/or County Clerk, as required by CEQA.
3. If your organization is a nonprofit, there is no other California public agency having discretionary authority over your project, and you would like the SNC to prepare a NOE

for your project, let us know that and list any permits, surveys, and/or reports that have been completed to support the CEQA status. All supplementary documentation must be provided to the SNC before the NOE can be prepared.
Click here to enter text.

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☐ **Negative Declaration OR**
☐ **Mitigated Negative Declaration**

*If a project requires a Negative Declaration or Mitigated Negative Declaration, then applicants must work with a qualified public agency, i.e., one that has discretionary authority over project approval or permitting, to complete the CEQA process.*

1. Describe how your project complies with the requirements for the use of a Negative Declaration or a Mitigated Negative Declaration per CEQA:
   Click here to enter text.

2. Submit the approved Initial Study and Negative Declaration/Mitigated Negative Declaration along with any Mitigation Monitoring or Reporting Plans, permits, surveys, and/or reports that have been completed to support this CEQA status. The IS/ND/MND must be accompanied by a signed, approved Notice of Determination, which must bear a date stamp to show that it has been filed with the State Clearinghouse and/or County Clerk, as required by CEQA.

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☐ **Environmental Impact Report**

*If a project requires an Environmental Impact Report, then applicants must work with a qualified public agency, i.e., one that has discretionary authority over project approval or permitting, to complete the CEQA process.*

1. Describe how your project complies with the requirements for the use of an Environmental Impact Report per CEQA:
   Click here to enter text.

2. Submit the Draft and Final Environmental Impact Report along with any Mitigation Monitoring or Reporting Plans, permits, surveys, and/or reports that have been completed to support this CEQA status. The EIR documentation must be accompanied by a signed, approved Notice of Determination, which must bear a date stamp to show that it has been filed with the State Clearinghouse and/or County Clerk, as required by CEQA.
   Click here to enter text.

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## NEPA STATUS

*Check the box that corresponds with the NEPA compliance for your project.*

☐ **Categorical Exclusion**
Submit the signed, approved Decision Memo and Categorical Exclusion, as well as documentation to support the Categorical Exclusion, including any permits, surveys, and/or reports that have been completed to support this NEPA status.

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☐ **Environmental Assessment & Finding of No Significant Impact**
Submit the signed, approved Environmental Assessment and Finding of No Significant Impact along with any permits, surveys, and/or reports that have been completed to support this NEPA status.

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☐ **Environmental Impact Statement**
Submit the Draft and approved, Final Environmental Impact Statement, along with the Record of Decision and any permits, surveys, and/or reports that have been completed to support this NEPA status.

**Project #730-306-9/27/2010**
**CEQA#9408a**

**State of California**
**Department of Parks and Recreation**

## NOTICE OF EXEMPTION

**TO**: Office of Planning and Research
1400 Tenth Street
Sacramento, CA 95814

**FROM**: Department of Parks and Recreation
Central Valley District
22708 Broadway Street
Columbia, CA 95310

**PROJECT TITLE:** North Grove Forest Restoration Project Amendment

**LOCATION:** Calaveras Big Trees State Park

**COUNTY:** Calaveras

**DESCRIPTION OF THE NATURE AND PURPOSE OF PROJECT**: Conduct forest thinning and hazard fuel reduction on 1080 acres at Calaveras Big Trees State Park to reduce the threat of catastrophic wildfire and improve native forest composition and structure to historic conditions.

Work will:

- Manually remove shrubs, shade-tolerant trees less than 8" DBH, and all dead and diseased vegetation.
- Place fuels in 5'X5' piles; and burn piles prior to conducting prescribed burn.
- Cut 5' W fire lines throughout the 1080 acres to prepare and perform the prescribed burn.

Work in the 35 acre area of the Bigtree National Forest has been completed.

This NOE supersedes SCH # 2010118195

**PUBLIC AGENCY APPROVING THE PROJECT**: California Department of Parks and Recreation

**NAME OF DIVISION OR DISTRICT CARRYING OUT THE PROJECT**: Central Valley District

**EXEMPT STATUS**:

☒ Categorical Exemption Class: 1 & 4 Section: 15301, 15304

REASONS WHY PROJECT IS EXEMPT: Project consists of maintenance or minor alteration of existing public facilities or topographical features involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination; and minor public alterations in the condition of land, water, and/or vegetation which do not involve the removal of healthy, mature, scenic trees except for forestry purposes; included as "resource management projects", "prescribed burns to maintain native vegetation" and "prescribed burns to restore native vegetation, reduce fuel loads, and control invasive exotic or alien species" in the Department of Parks and Recreation's list of exempt activities, in accordance with CCR§ 15300.4.

**CONTACT**: *Heather M Reith, DEC*
*Central Valley District*

**TELEPHONE: (209) 536-2887**
**EMAIL:** heather.reith@parks.ca.gov

Jess C. Cooper

**Jess C. Cooper, District Superintendent**

**DATE** 4/10/13

**Project #730-306-9/27/2010**
**CEQA# 9408**

**State of California**
**Department of Parks and Recreation**

# NOTICE OF EXEMPTION

**TO**: Office of Planning and Research
1400 Tenth Street
Sacramento, CA 95814

**FROM**: Department of Parks and Recreation
Central Valley District
22708 Broadway Street
Columbia, CA 95310

**PROJECT TITLE: Vegetation Removal and Prescribed Burn**

**LOCATION: Calaveras Big Trees State Park** **COUNTY: Calaveras & Tuolumne**

**DESCRIPTION OF THE NATURE AND PURPOSE OF PROJECT**: Remove vegetation and conduct prescribed burn in the areas known as Bigtree National Forest (BTNF) and North Grove sites at Calaveras Big Trees State Park to reduce the threat of wildfire and improve native forest composition and structure.

**BTNF:** Work will manually remove woody debris on 35 acres in BTNF; place debris in 5'X5' piles; and burn piles prior to conducting prescribed burn. Rake duff down to mineral soil approximately 10' around the base of old growth sugar pine trees greater than 40" diameter at breast height (DBH) to prevent high intensity heating and scorching during prescribed burn. Cut 5' W fire lines throughout the 35 acres to prepare and perform the prescribed burn.

**North Grove:** Work will manually remove shrubs, shade-tolerant trees less than 6" DBH, and all dead and diseased vegetation, on 125 acres in North Grove. Place fuels in 5'X5' piles; and burn piles prior to conducting prescribed burn. Cut 5' W fire lines throughout the 125 acres to prepare and perform the prescribed burn.

**PUBLIC AGENCY APPROVING THE PROJECT**: California Department of Parks and Recreation

**NAME OF DIVISION OR DISTRICT CARRYING OUT THE PROJECT**: Central Valley District

**EXEMPT STATUS**:
☒ Categorical Exemption Classes: 1, 4 Sections: 15301, 15304

REASONS WHY PROJECT IS EXEMPT: Project consists of maintenance or minor alteration of existing public facilities or topographical features involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination; and minor public alterations in the condition of land, water, and/or vegetation which do not involve the removal of healthy, mature, scenic trees except for forestry purposes; included as "prescribed burns to maintain native vegetation" and "prescribed burns to restore native vegetation, reduce fuel loads, and control invasive exotic or alien species" in the Department of Parks and Recreation's list of exempt activities, in accordance with CCR§ 15300.4.

**CONTACT**: *Heather M Reith, DEC*
*Central Valley District*

**TELEPHONE: (209) 536-2887**
**EMAIL:** hreith@parks.ca.gov

Jess C. Cooper

**Jess C. Cooper, District Superintendent**

**DATE** 11/15/10

# Vegetation Removal and Prescribed Burn

**SCH Number:** 2010118195

**Document Type:** NOE - Notice of Exemption

**Project Lead Agency:** Parks and Recreation, Department of

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**Project Description**

Remove vegetation and conduct prescribed burn in the areas known as Bigtree National Forest (BTNF) and North Grove sites at Calaveras Big Trees State Park to reduce the threat of wildfire and improve native forest composition and structure. BTNF: Work will manually remove woody debris on 35 acres in BTNF; place debris in 5'X5' piles and burn piles prior to conducting prescribed burn. Rake duff down to mineral soil approximately 10' around the base of old growth sugar pine trees greater than 40" diameter at breast height (DBH) to prevent high intensity heating and scorching during prescribed burn. Cut 5' W fire lines throughout the 35 acres to prepare and perform the prescribed burn. North Grove: Work will manually remove shrubs, shade-tolerant trees less than 6" DBH, and all dead and diseased vegetation, on 126 acres in North Grove. Place fuels in 5'X5' piles; and burn piles prior to conducting prescribed burn. Cut 5' W fire lines throughout the 125 acres to prepare and perform the prescribed burn.

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**Contact Information**

**Primary Contact:**
Heather M Reith
California Department of Parks and Recreation
209 536 2887
Central Valley District
22708 Broadway Street
Columbia, CA 95310

---

**Project Location**

County: Calaveras, Tuolumne
City:
Region:
Cross Streets:
Latitude/Longitude:
Parcel No:
Township:
Range:
Section:
Base:
Other Location Info: Calaveras Big Trees State Park

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**Exempt Status**

- [ ] Ministerial
- [ ] Declared Emergency
- [ ] Emergency Project
- [x] Categorical Exemption
- [ ] Statutory Exemption

**Type, Section or Code Number** C: 1,4; S: 15301,15304

**Reasons for Exemption**

Project consists of maintenance or minor alteration of existing public facilities or topographical features involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination; and minor public alterations in the condition of land, water, and/or vegetation which do not involve the removal of healthy, mature, scenic trees except for the forestry purposes; included as "prescribed burns to maintain native vegetation" and "prescribed burns to restore native vegetation, reduce fuel loads, and control invasive exotic or alien species" in the Department of Parks and Recreation's list of exempt activities, in accordance with CCR S 15300.4.

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**Date Received:** 11/15/2010

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CEQAnet HOME | NEW SEARCH

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

CEQA ID No.

Project ID No. 730-306-9/27/2010

PCA No.

# PROJECT EVALUATION (PEF)

| PROJECT CONCEPT | | |
|---|---|---|
| PROJECT TITLE<br>North Grove Forest Restoration Project Amendment | | PARK UNIT NAME<br>Calaveras Big Trees State Park |
| DISTRICT NAME<br>Central Valley | | FACILITY NO.<br>306 |
| PROJECT MANAGER<br>Heather Reith | PHONE NO.<br>209-536-2887 | EMAIL<br>Heather.Reith@parks.ca.gov |
| DISTRICT PROJECT MANAGER<br>Liz Steller | PHONE NO.<br>209-536-5932 | EMAIL<br>Liz.Steller@parks.ca.gov |
| PROJECT BID DATE | CONSTRUCTION START DATE<br>March 2013 | FUNDING SOURCE |

## PROJECT DESCRIPTION

*Identify the scope of the project in detail, including its purpose, location, and potential impacts. If the ground is to be disturbed, describe the depth and extent of excavation. Describe the existing site conditions, including previous development. Note if work will impact or extend beyond park property. Indicate if work will be done in conjunction with, or as part of, other projects. (Use additional pages if necessary.)*

**Original Project Description:** Project includes having labor crews manually cut and stack in piles the live and dead surface fuels consisting of shrubs, dogwoods, and small shade-tolerant trees up to 6 inch diameter at breast height. All dead, diseased, and approximately 90% live understory shrubs and small trees will be removed to break the vertical fuel ladder to larger trees and to the giant sequoias, creating a more defensible forest system against wildland fire. Lightning strikes are not uncommon at Calaveras Big Trees State Park, and the North Grove is extremely vulnerable at this time. Some pockets of larger specimen dogwoods will be spared for visitor enjoyment. This fuel treatment would be phase one of an overall restoration project that will include prescribed fire in the future. Work tools and equipment includes chainsaws, loppers, and other hand tools. Labor crews will not be responsible for burning the piles as this will be done during the winter and spring seasons and/or in conjunction with a prescribed burn plan. The project area is approximately 125 acres and is not currently funded.

**Added Information for Amendment:** The North Grove Forest Restoration project will include an additional 1,081 acres of forest land to be treated for wildland fire protection of the North Grove Giant Sequoia forest. These additional acres surround the North Grove (see map) and will help to secure a perimeter around the grove. Project will manually cut and stack in piles the live and dead surface fuels consisting of shrubs, dogwoods, and small shade-tolerant trees up to 8 inch diameter at breast height. The goal of the project is to reduce fuel loads from 400 stems per acre to 50-70 stems per acre therefore larger size shade-tolerant trees may be manually cut to achieve the project goal. Surface woody debris will be reduced from 35-80 tons/acre to less than 10 tons/acre by piling and burning. Work will retain all giant sequoia and all healthy black oak, pacific yew, sugar pine, & ponderosa pine. All work will be done by Natural Resources State Park staff, California Conservation Corps, California Department of Forestry and Fire crews, and California Conservation Corps-Veterans Program.

## DOCUMENTS ATTACHED

- ☒ 7.5 minute (quad) map of project area *(**Required**)*
- ☒ Site Map *(**Required** - Scale should show relationship to existing buildings, roads, landscape features, etc.)*
- ☐ Graphics (*Specify - photos, diagrams, drawings, cross-sections, etc.*):
- ☐ Other (*Specify*):

## REGULATORY REQUIREMENTS

| *IS AN APPLICATION, PERMIT, OR CONSULTATION REQUIRED?* | YES | MAYBE | NO | CONTACT |
|---|---|---|---|---|
| Coastal Development Permit | ☐ | ☐ | ☒ | ☐ |
| DFG Stream Alteration Permit | ☐ | ☐ | ☒ | ☐ |
| State & Federal Endangered Species Consultation | ☐ | ☐ | ☒ | ☐ |
| Corps of Engineers 404 Permit | ☐ | ☐ | ☒ | ☐ |
| RWQCB or NPDES Permit | ☐ | ☐ | ☒ | ☐ |
| DPR Right to Enter or Temporary Use Permit | ☐ | ☐ | ☒ | ☐ |
| PRC 5024 Review | ☒ | ☐ | ☐ | ☐ |
| Americans with Disabilities Act | ☐ | ☐ | ☒ | ☐ |
| Stormwater Management Plan | ☐ | ☐ | ☒ | ☐ |
| Encroachment Permit *(Specify Agency)*: | ☐ | ☐ | ☒ | ☐ |
| Other *(Specify)*: | ☐ | ☐ | ☐ | ☐ |

*COMMENTS:*

## DEPARTMENT POLICY COMPLIANCE

| | YES | NO |
|---|---|---|
| *HAS A GENERAL PLAN BEEN APPROVED FOR THE UNIT?* | ☒ | ☐ |
| If YES, is the project consistent with the GP? | ☒ | ☐ |
| If NO, what is the project justification? | | |
| Is it a temporary facility? (No permanent resource commitment) | ☐ | ☐ |
| Health and Safety? | ☐ | ☐ |
| Is it a Resource Management Project? | ☐ | ☐ |
| Is it repairing, replacing, or rehabilitating an existing facility? | ☐ | ☐ |
| *IS THE PROJECT WITHIN A CLASSIFIED SUBUNIT?* | | |
| Natural Preserve | ☐ | ☒ |
| Cultural Preserve | ☐ | ☒ |
| State Wilderness | ☐ | ☒ |
| *IS THE PROJECT CONSISTENT WITH THE DEPARTMENT'S CULTURAL RESOURCE MANAGEMENT DIRECTIVES?* | ☑ | ☐ |
| *IS THE PROJECT CONSISTENT WITH THE DEPARTMENT'S OPERATIONS MANUAL CHAPTER 0300?* | ☑ | ☐ |

*COMMENTS:*

| SUPERINTENDENT PROJECT CONCEPT APPROVAL OR DESIGNEE | TITLE | DATE |
|---|---|---|
| [signature] | Calaveras Sector Superintendent | 2/25/2013 |

## RESOURCES

***Explain all 'Yes' or 'Maybe' answers in the "Evaluation and Comments" section (reference by letter and number). Attach additional pages, if necessary.***

| YES | MAYBE | NO | **A. EARTH** – *WILL THE PROJECT:* |
|---|---|---|---|
| ☐ | ☐ | ☒ | 1. Create unstable soil or geologic conditions? |
| ☐ | ☐ | ☒ | 2. Adversely affect topographic features? |
| ☐ | ☐ | ☒ | 3. Adversely affect any unusual or significant geologic features? |
| ☐ | ☐ | ☒ | 4. Increase wind or water erosion? |
| ☐ | ☐ | ☒ | 5. Adversely affect sand deposition or erosion of a sand beach? |
| ☐ | ☐ | ☒ | 6. Expose people, property, or facilities to geologic hazards or hazardous waste? |
| ☐ | ☐ | ☒ | 7. Adversely affect any paleontological resource? |

| YES | MAYBE | NO | **B. AIR** – *WILL THE PROJECT:* |
|---|---|---|---|
| ☐ | ☐ | ☒ | 1. Adversely affect general air quality or climatic patterns? |
| ☐ | ☐ | ☒ | 2. Introduce airborne pollutants that may affect plant or animal vigor or viability? |
| ☒ | ☐ | ☐ | 3. Increase levels of dust or smoke? |
| ☐ | ☒ | ☐ | 4. Adversely affect visibility? |

| YES | MAYBE | NO | **C. WATER** – *WILL THE PROJECT:* |
|---|---|---|---|
| ☐ | ☐ | ☒ | 1. Change or adversely affect movement in marine or fresh waters? |
| ☐ | ☐ | ☒ | 2. Change or adversely affect drainage patterns or sediment transportation rates? |
| ☐ | ☐ | ☒ | 3. Adversely affect the quantity or quality of groundwater? |
| ☐ | ☐ | ☒ | 4. Adversely affect the quantity or quality of surface waters? |
| ☐ | ☐ | ☒ | 5. Expose people or property to flood waters? |
| ☐ | ☐ | ☒ | 6. Adversely affect existing or potential aquatic habitat(s)? |

| YES | MAYBE | NO | **D. PLANT LIFE** – *WILL THE PROJECT:* |
|---|---|---|---|
| ☐ | ☐ | ☒ | 1. Adversely affect any native plant community? |
| ☐ | ☐ | ☒ | 2. Adversely affect any unique, rare, endangered, or protected plant species? |
| ☐ | ☒ | ☐ | 3. Introduce a new species of plant to the area? |
| ☐ | ☐ | ☒ | 4. Adversely affect agricultural production? |
| ☐ | ☐ | ☒ | 5. Adversely affect the vigor or structure of any tree? |
| ☐ | ☒ | ☐ | 6. Encourage the growth or spread of alien (non-native) species? |
| ☐ | ☐ | ☒ | 7. Interfere with established fire management plans or practices? |

| YES | MAYBE | NO | **E. ANIMAL LIFE** – *WILL THE PROJECT:* |
|---|---|---|---|
| ☐ | ☒ | ☐ | 1. Adversely affect any native or naturalized animal population? |
| ☐ | ☒ | ☐ | 2. Adversely affect any unusual, rare, endangered, or protected species? |
| ☐ | ☐ | ☒ | 3. Adversely affect any animal habitat? |
| ☐ | ☐ | ☒ | 4. Introduce or encourage the proliferation of any non-native species? |

| YES | MAYBE | NO | **F. CULTURAL RESOURCES** – *WILL THE PROJECT:* |
|---|---|---|---|
| ☐ | ☒ | ☐ | 1. Adversely affect a prehistoric or historic archeological site? |
| ☐ | ☒ | ☐ | 2. Adversely affect a prehistoric or historic building, structure, or object? |
| ☐ | ☐ | ☐ | 3. Cause an adverse physical or aesthetic effect on an eligible or contributing building, structure, object, or cultural landscape? |
| ☐ | ☒ | ☐ | 4. Diminish the informational or research potential of a cultural resource? |
| ☐ | ☒ | ☐ | 5. Increase the potential for vandalism or looting? |
| ☐ | ☐ | ☒ | 6. Disturb any human remains? |
| ☐ | ☐ | ☒ | 7. Restrict access to a sacred site or inhibit the traditional religious practice of a Native American community? |

F1-2, 4-7 checked by District Cultural Specialist Linda Dick Bissonnette, 2/28/13. F3 to be completed by a Historian.

| YES | MAYBE | NO | **G. AESTHETIC RESOURCES** – *WILL THE PROJECT:* |
|---|---|---|---|
| ☐ | ☐ | ☒ | 1. Adversely affect a scenic vista or view? |
| ☐ | ☐ | ☒ | 2. Significantly increase noise levels? |
| ☐ | ☐ | ☒ | 3. Adversely affect the quality of the scenic resources in the immediate area or park-wide? |
| ☐ | ☐ | ☒ | 4. Create a visually offensive site? |
| ☐ | ☐ | ☒ | 5. Be incompatible with the park design established for this unit or diminish the intended sense of "a special park quality" for the visitor? |

| YES | MAYBE | NO | H. RECREATIONAL RESOURCES – *WILL THE PROJECT:* |
|---|---|---|---|
| ☒ | ☐ | ☐ | 1. Be in a public use area? |
| ☐ | ☐ | ☒ | 2. Have an adverse effect on the quality of the intended visitor experience? |
| ☐ | ☐ | ☒ | 3. Have an adverse effect on the quality or quantity of existing or future recreational opportunities or facilities? |
| ☐ | ☐ | ☒ | 4. Have an adverse effect on the accessibility of recreational facilities (e.g., ADA requirements)? |

## EVALUATION AND COMMENTS

Project activities have the capability of temporarily increasing levels of dust, smoke, and air quality during tree felling activities and pile burning. Project activities could cause impacts to sensitive wildlife and could potentially introduce a new species of plant to the area and/or encourage the growth or spread of alien (non-native) species. Implementation of the conditions outlined in the ES comment section will address potential project impacts to sensitive resources and reduce them to less than significant impacts.

## ENVIRONMENTAL REVIEW

***To Be Completed by Qualified Specialist(s) ONLY.***
***Attach additional reviews or continuation pages, as necessary.***

**ARCHEOLOGIST COMMENTS** ☐ No Significant Impact ☒ Conditions ☐ Mitigation ☐ Potential Impact

There are 8 recorded archaeological sites in the expanded project area/Area of Direct Impacts (not to mention those that are adjacent). The District Archaeologist and Project Manager will field check them together when conditions permit (and flag their boundaries if necessary prior to forest treatments) to implement the stipulations in the 9/17/12 PRC 5024 review for the North Grove Forest Restoration project. That is, trees to be felled will be felled away from sites, burn piles will be placed outside of site boundaries, and fire lines will also be dug outside of site boundaries, to avoid significant negative impacts to sites and associated features from intense thermal effects and other physical disturbance/impacts. If these conditions are implemented successfully, the amended project will qualify for a categorical exemption as far as archaeological resources and CEQA are concerned.

☐ PRC 5024 Attached

| SIGNATURE | PRINTED NAME |
|---|---|
| *Linda Dick Bissonnette* | Linda Dick-Bissonnette |
| TITLE | DATE |
| Associate State Archaeologist | 2/28/13 |

**HISTORIAN COMMENTS** ☐ No Significant Impact ☐ Conditions ☐ Mitigation ☐ Potential Impact

☐ PRC 5024 Attached

| SIGNATURE | PRINTED NAME |
|---|---|
| | Dan Osanna |
| TITLE | DATE |
| State Historian III | |

**ENVIRONMENTAL SCIENTIST COMMENTS** ☒ No Significant Impact ☒ Conditions ☐ Mitigation ☐ Potential Impact

B3, B4 – Air: Temporary increases in levels of dust or smoke may occur during tree felling activities and pile burning. Dust levels will settle after the trees have been felled and will not create any significant impacts to air quality. Piles will be burned during the appropriate season and weather conditions with burn permits and smoke management permit from Cal Fire and Calaveras Air Pollution Control District. This will reduce smoke levels in the air and reduce chances of affecting visibility.

D3, D6 – Plant Life: Ground disturbing activities have potential to encourage the growth or spread of invasive plant species and equipment has the potential to encourage or introduce invasive plant species. All Construction equipment used on this project shall be clean and free of soil and plant material before arrival at the project site and before leaving the park in order to prevent introduction of invasive plants to the area. Areas will be monitored in the future to determine if there has been an introduction of invasive plants to the park. If establishment occurs the species will be eradicated immediately through hand pulling.

E1, E2 – Animal Life: To the extent possible, all work activities should occur during the non-breeding season. If initiation of construction activities which could potentially cause "take" of nesting migratory birds or raptors (as determined by a DPR-approved biologist) are necessary during the breeding season of March 1 to August 31, then surveys by a DPR-approved biologist will be required. Surveys will be conducted 2 weeks prior to start of work. If nesting migratory birds or raptors are located in the project area then a buffer area of 250 feet will be installed around raptor nest trees and 100 feet around migratory bird nests in trees and shrubs. No work will occur in the buffer areas until the nest is vacated and the juveniles have fledged (as determined by a DPR-approved biologist). Project manager will contact the district's ES one month prior to start of work to schedule surveys.

| SIGNATURE | PRINTED NAME |
|---|---|
| Heather M Reith | Heather M. Reith |
| TITLE: District Environmental Scientist | DATE: 3/12/13 |

**MAINTENANCE CHIEF/SUPERVISOR COMMENTS** ☑ No Significant Impact ☐ Conditions ☐ Mitigation ☐ Potential Impact

| SIGNATURE | PRINTED NAME |
|---|---|
| Alec Varner | Alec Varner |
| TITLE: Maintenance Chief I | DATE: 3/12/13 |

**OTHER SPECIALIST COMMENTS** ☐ No Significant Impact ☐ Conditions ☐ Mitigation ☐ Potential Impact

| SIGNATURE | PRINTED NAME |
|---|---|
| | Gary Olson |

| TITLE | DATE |
|---|---|
| Park Superintendent | |

**Sector Superintendent Comment Review** ☒ Conditions Acceptable ☐ Conditions Not Acceptable (comment and discuss with Specialist) ☐ Mitigation Acceptable ☐ Mitigation Not Acceptable (comment ad discuss with Specialist)

| SIGNATURE | PRINTED NAME |
|---|---|
| G Martin | Greg Martin |
| TITLE | DATE |
| Calaveras Sector Superintendent | 3/25/13 |

## ENVIRONMENTAL COORDINATOR REVIEW

| YES | MAYBE | NO | CUMULATIVE IMPACTS |
|---|---|---|---|
| ☐ | ☐ | ☒ | 1. Will the project be conducted in conjunction with or at the same time as other projects at the park? |
| ☐ | ☐ | ☒ | 2. Will the project be part of a series of inter-related projects? |
| ☐ | ☐ | ☒ | 3. Are there any other projects that must be completed for any part of this project to become operational? |
| ☐ | ☐ | ☒ | 4. Are there any other projects (including deferred maintenance) that have been completed or any probable future projects that could contribute to the cumulative impacts of this project? |
| ☐ | ☐ | ☒ | 5. Are any of the projects that relate to the proposed work outside the General Plan? |

*COMMENTS:*

*RECOMMENDATION:*

- ☐ Not a project for the purposes of CEQA compliance.
- ☒ The project is exempt. A Notice of Exemption should be filed.
- ☐ A Negative Declaration should be prepared.
- ☐ A Mitigated Negative Declaration should be prepared.
- ☐ An EIR should be prepared.

| SIGNATURE | PRINTED NAME |
|---|---|
| Heather M Reith | Heather M. Reith |
| TITLE | DATE |
| Natural Resources Environmental Coordinator | 3/25/13 |

## DISTRICT SUPERINTENDENT REVIEW

*COMMENTS:*

***I acknowledge any constraints placed on the project as a result of the specialists' comments above and recommend the project proceed.***

| DISTRICT SUPERINTENDENT APPROVAL SIGNATURE | TITLE | DATE |
|---|---|---|
| Jean C. Cooper | SCS-V | 3/25/13 |

**Reith, Heather@Parks**

**From:** Osanna, Dan@Parks
**Sent:** Wednesday, February 27, 2013 8:52 AM
**To:** Reith, Heather@Parks
**Cc:** Steller, Liz@Parks
**Subject:** RE: Request for Project Evaluation-Expedited Review

**Follow Up Flag:** Follow up
**Flag Status:** Flagged

Hi Heather:

Our comments will not change. The original still applies.

Thanks,
Dan

**From:** Reith, Heather@Parks
**Sent:** Tuesday, February 26, 2013 4:18 PM
**To:** Martin, Greg@Parks; Olson, Gary@Parks; Varner, Alec@Parks; Dick-Bissonnette, Linda@Parks; Osanna, Dan@Parks
**Cc:** Steller, Liz@Parks
**Subject:** Request for Project Evaluation-Expedited Review
**Importance:** High

# Subject: Request for Project Evaluation Expedited Review

Attached is the Project Evaluation Form (PEF) for the **North Grove Forest Restoration Project Amendment** project at **Calaveras Big Trees State Park**. Please complete your review and return your review pages to me, along with any additional supporting materials by **March 5, 2013**. This PEF is an amendment of the original PEF (see attached). Please review your original comments and if they still apply cross out the original signature and date and add a new signature and date to your comment page. Please forward only that comment page if you do not have any additional comments. If you have additional comments use the attached DPR183 to write your new comments and route your comments to me by March 5.

This PEF is being expedited because we have an opportunity to get fuels work done to secure the perimeter of the North Grove giant sequoia forest. It is also a program that is putting veterans back to work through training them in fuels reduction projects.

The Project Manager is **Heather Reith** and he/she can be reached at **209-795-3488** or by email at **Heather.Reith@parks.ca.gov**. If you have any questions related to the project or the project design please contact the Project Manager. Make sure to cc the Sector Superintendent in charge of the unit and me on any correspondence pertaining to this project.

*Thank you,*
*Heather M. Reith*

**Reith, Heather@Parks**

| | |
|---|---|
| **From:** | Olson, Gary@Parks |
| **Sent:** | Tuesday, March 12, 2013 11:57 AM |
| **To:** | Reith, Heather@Parks; Martin, Greg@Parks; Varner, Alec@Parks; Dick-Bissonnette, Linda@Parks; Osanna, Dan@Parks |
| **Cc:** | Steller, Liz@Parks |
| **Subject:** | RE: Request for Project Evaluation-Expedited Review |

I have no additional comments.

Gary Olson
209-795-8904

---

**From:** Reith, Heather@Parks
**Sent:** Monday, March 11, 2013 1:27 PM
**To:** Martin, Greg@Parks; Olson, Gary@Parks; Varner, Alec@Parks; Dick-Bissonnette, Linda@Parks; Osanna, Dan@Parks
**Cc:** Steller, Liz@Parks
**Subject:** RE: Request for Project Evaluation-Expedited Review

Hello!

Please forward your review by the end of the day tomorrow (3/12/2013). This pertains to those who have not submitted their review.

**Thank you,**
*Heather M. Reith*

Heather M. Reith
Environmental Scientist
California State Parks
Central Valley District
District Office: (209) 536-2887
Big Trees Office: (209) 795-3488
Cell: (209) 840-8565
Fax: (209) 536-2978

**"Without continual growth and progress such words as improvement, achievement, and success have no meaning."**
-- Benjamin Franklin

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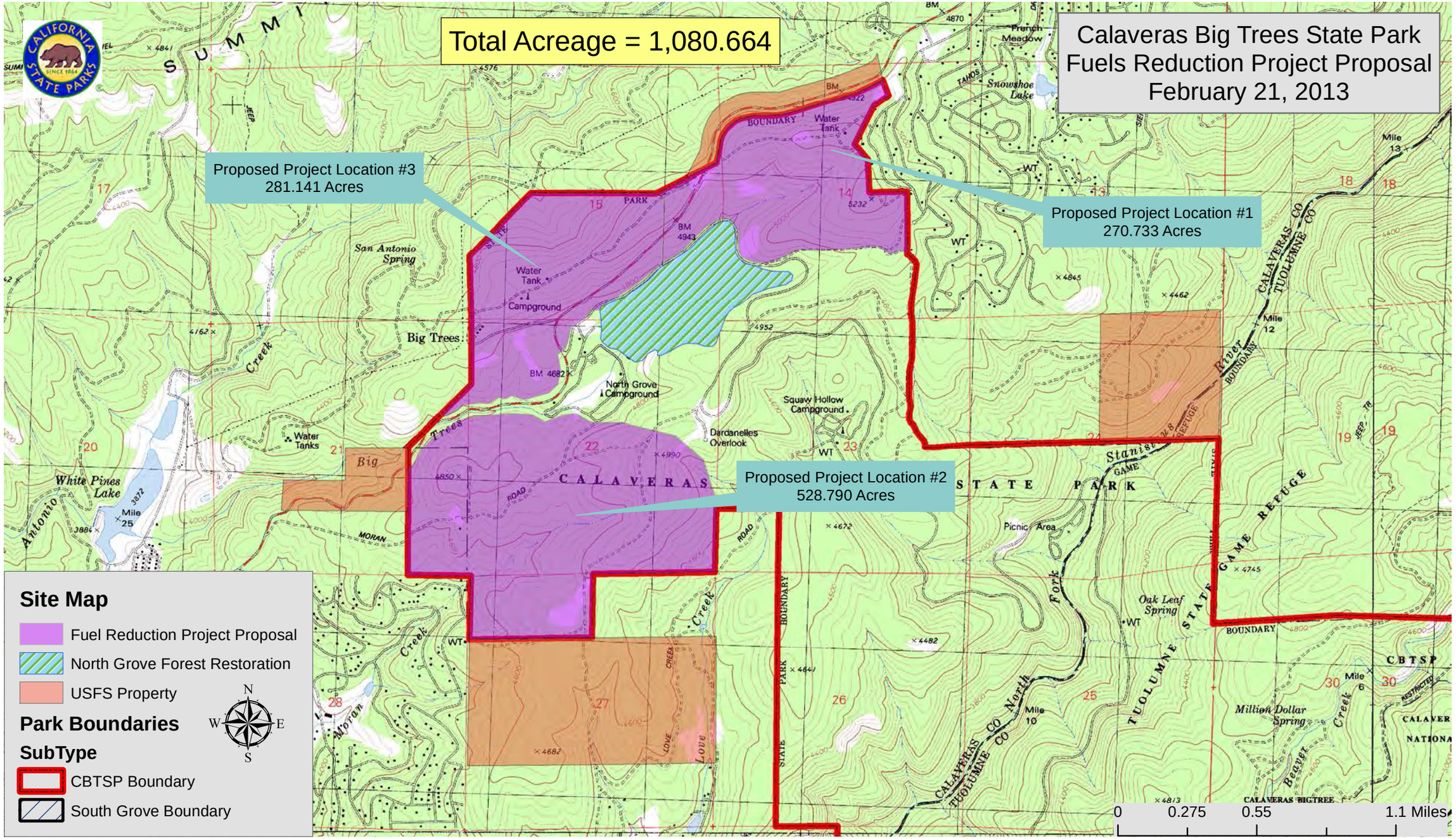
**From:** Reith, Heather@Parks
**Sent:** Tuesday, February 26, 2013 4:18 PM
**To:** Martin, Greg@Parks; Olson, Gary@Parks; Varner, Alec@Parks; Dick-Bissonnette, Linda@Parks; Osanna, Dan@Parks
**Cc:** Steller, Liz@Parks
**Subject:** Request for Project Evaluation-Expedited Review
**Importance:** High

# Subject: Request for Project Evaluation


Total Acreage = 1,080.664
Calaveras Big Trees State Park
Fuels Reduction Project Proposal
February 21, 2013
Proposed Project Location #3
281.141 Acres
Proposed Project Location #1
270.733 Acres
Proposed Project Location #2
528.790 Acres
Site Map
Fuel Reduction Project Proposal
North Grove Forest Restoration
USFS Property
Park Boundaries
SubType
CBTSP Boundary
South Grove Boundary
N
S
E
W
0
0.275
0.55
1.1 Miles
CALAVERAS BIG TREES STATE PARK
Big Trees
San Antonio Spring
White Pines Lake
Water Tank
Campground
North Grove Campground
Squaw Hollow Campground
Dardanelles Overlook
Water Tanks
Snowshoe Lake
French Meadow
Picnic Area
Oak Leaf Spring
Million Dollar Spring
Beaver Creek
Moran Creek
Love Creek
North Fork Stanislaus River
CALAVERAS CO
TUOLUMNE CO
TUOLUMNE STATE GAME REFUGE
CALAVERAS BIGTREE
CBTSP
Mile 6
Mile 10
Mile 12
Mile 13
Mile 25
BM 4943
BM 4682
BM 4870
BM 5232
BM 4522
BOUNDARY
PARK
ROAD
MORAN
WT

STATE OF CALIFORNIA

# CALAVERAS BIG TREES STATE PARK

Resources - Wildlife Survey

**Species** California Spotted Owl **Date** 6/13/13

**Survey Route** Big Tree Village / "Oak Hollow" **Unit** (300/CBT) Mastin Grove

**Outing Results** Negative **Observers** Heather Reitz (SES), S. Strauss (SPST), Angie, Felicia Bratti

**Habitat** Mixed Conifer

**Visit Number** #1 **Sky Condition** Clear

**Period** Nesting **Wind** 1-3 mph

**Survey Type** Vocal Immitation **Temperature** 53° F

**Total Detections** Ø

**Survey Begin Time** 2138 **Survey End Time** 2208 **Total Survey Time** Ø hrs, 30 minutes

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Pt. # | 1 | Begin | 2138 | End | 2148 | Detection | Ø | Bearing | |
| Pt. # | 3 | Begin | 2158 | End | 2208 | Detection | Ø | Bearing | |
| Pt. # | | Begin | | End | | Detection | | Bearing | |
| Pt. # | | Begin | | End | | Detection | | Bearing | |
| Pt. # | | Begin | | End | | Detection | | Bearing | |
| Pt. # | | Begin | | End | | Detection | | Bearing | |
| Pt. # | | Begin | | End | | Detection | | Bearing | |
| Pt. # | | Begin | | End | | Detection | | Bearing | |
| Pt. # | | Begin | | End | | Detection | | Bearing | |
| Pt. # | | Begin | | End | | Detection | | Bearing | |

**Survey Description**

Point #1: very noisy campers and highway noise

Point #3: heard songbird or bat squeaking

STATE OF CALIFORNIA

# CALAVERAS BIG TREES STATE PARK

Resources - Wildlife Survey

Species: California Spotted Owl

Date: 7/11/13

Survey Route: "Oak Hollow"/Big Trees Village

Unit: North Grove (306/CBT)

Outing Results: 1 detection

Observers: Heather Reith (SES), Felicia Bratti, Mia Keady

Habitat: Mixed Conifer

Visit Number: # 2

Sky Condition: clear

Period: Fledging

Wind: Ø mph

Survey Type: Vocal Immitation

Temperature: 65°F

Total Detections: 1

Survey Begin Time: 2140 Survey End Time: 2256 Total Survey Time: 1 hr, 16 minutes

| Pt. # | Begin | End | Detection | Bearing |
|---|---|---|---|---|
| 4 | 2140 | 2147 | 1 | S 154° E |
| 5 | 2154 | 2204 | Ø | |
| 6 | 2211 | 2221 | Ø | |
| 7 | 2227 | 2237 | Ø | |
| 8 | 2246 | 2256 | Ø | |
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Survey Description

Point #4: Possible juvenile begging call

STATE OF CALIFORNIA

# CALAVERAS BIG TREES STATE PARK

Resources - Wildlife Survey

Species: Northern Goshawk

Date: 7/17/13

Survey Route: Moran Road

Unit: 300/ Calaveras Big Trees

Outing Results: Negative

Observers: Sarah Browns (SP), Felicia Brady, Mia Keady

Habitat: Mixed Conifer

Visit Number: #1

Sky Condition: clear

Period: Fledgling

Wind: 2mph

Survey Type: Broadcast Audio

Temperature: 83° F

Total Detections: Ø

Survey Begin Time: 1131

Survey End Time: 1419

Total Survey Time: 2 hrs. 50 minutes

| Pt. # | Begin | End | Detection | Bearing |
|---|---|---|---|---|
| 4 | 1132 | 1138 | Ø | |
| 5 | 1154 | 1200 | Ø | |
| 6 | 1220 | 1226 | Ø | |
| 3 | 1349 | 1355 | Ø | |
| 2 | 1413 | 1419 | Ø | |
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Survey Description

Point #2: burg kill trees (≈10)

Point #4: heard distant call (similar to wail), most likely Northern Flicker / songbird

STATE OF CALIFORNIA

# CALAVERAS BIG TREES STATE PARK

Resources - Wildlife Survey

Species: Northern Goshawk

Date: 7/17/13

Survey Route: "Oak Hollow" / Big Tree Village

Unit: 3000/ABS (North Grove)

Outing Results: Negative

Observers: S. Sirovich, M. Keady, F. Bratti

Habitat: Mixed Conifer

Visit Number: #1

Sky Condition: clear

Period: Fledging

Wind: 3-5 mph

Survey Type: Broadcast Audio

Temperature: 90°

Total Detections: Ø

Survey Begin Time: 1524 Survey End Time: 1616 Total Survey Time: Ø hrs. 52 minutes

| Pt. # | Begin | End | Detection | Bearing |
|---|---|---|---|---|
| 4 | 1524 | 1530 | Ø | |
| 5 | 1539 | 1544 | Ø | |
| 6 | 1550 | 1556 | Ø | |
| 7 | 1609 | 1616 | Ø | |
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Survey Description

Point #4: Broad noise from Walter Smith Mem. Parkway

Point #5: Bug kill trees near snag on left-hand fire road

STATE OF CALIFORNIA

# CALAVERAS BIG TREES STATE PARK

Resources - Wildlife Survey

**Species** California Spotted Owl **Date** 6/4/14

**Survey Route** "Oak Hollow"/Big Tree Village **Unit** 300/Calaveras Big Trees

**Outing Results** Negative **Observers** Heather Reith (SES), Heather Ross (SMA), Sarah Strauss (SRA)

**Habitat** Mixed conifer

**Visit Number** #1 **Sky Condition** clear

**Period** Nesting **Wind** Ø mph

**Survey Type** Vocal Immitation **Temperature** 57°F

**Total Detections** Ø

**Survey Begin Time** 23:16 **Survey End Time** 23:58 **Total Survey Time** Ø hrs. 42 minutes

| Pt. # | Begin | End | Detection | Bearing |
|---|---|---|---|---|
| 7 | 23:16 | 23:26 | Ø | |
| 6 | 23:32 | 23:42 | Ø | |
| 5 | – | – | – | |
| 4 | 23:48 | 23:58 | Ø | |
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**Survey Description**

Point #4: heard a dog barking in the distance, faint.

Point #5: accidentally skipped pt. 5

STATE OF CALIFORNIA

# CALAVERAS BIG TREES STATE PARK

Resources - Wildlife Survey

**Species** California Spotted Owl **Date** 6/4/14

**Survey Route** Moran Road **Unit** 300 / Calaveras Big Trees

**Outing Results** Negative **Observers** Heather Reitz (SES), Sarah Strauss (SPA), Heather Ross (SMA)

**Habitat** Mixed Conifer

**Visit Number** #1 **Sky Condition** clear

**Period** Nesting **Wind** Ø mph

**Survey Type** Vocal Immitation **Temperature** 56°F

**Total Detections** Ø

**Survey Begin Time** 00:07 **Survey End Time** 00:54 **Total Survey Time** Ø hrs, 45 minutes

| Pt. # | Begin | End | Detection | Bearing |
|---|---|---|---|---|
| 4 | 0009 | 0014 | Ø | |
| 3 | 0025 | 0035 | Ø | |
| 2 | 0044 | 0054 | Ø | |
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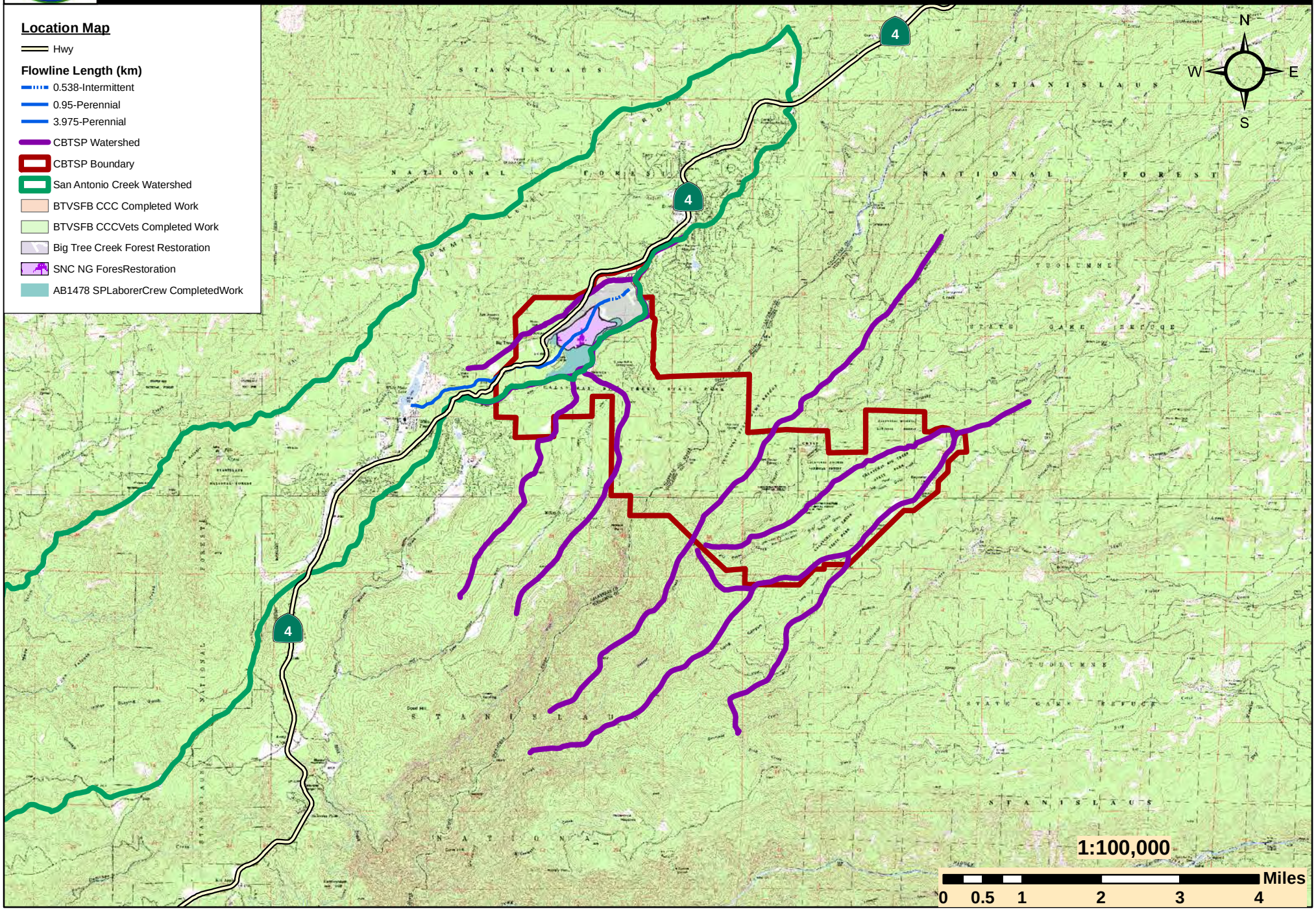
**Survey Description**

Point #4: heard songbird or bat squeaking.

Point #3: heard bear-proof food locker or dumpster slam in the distance

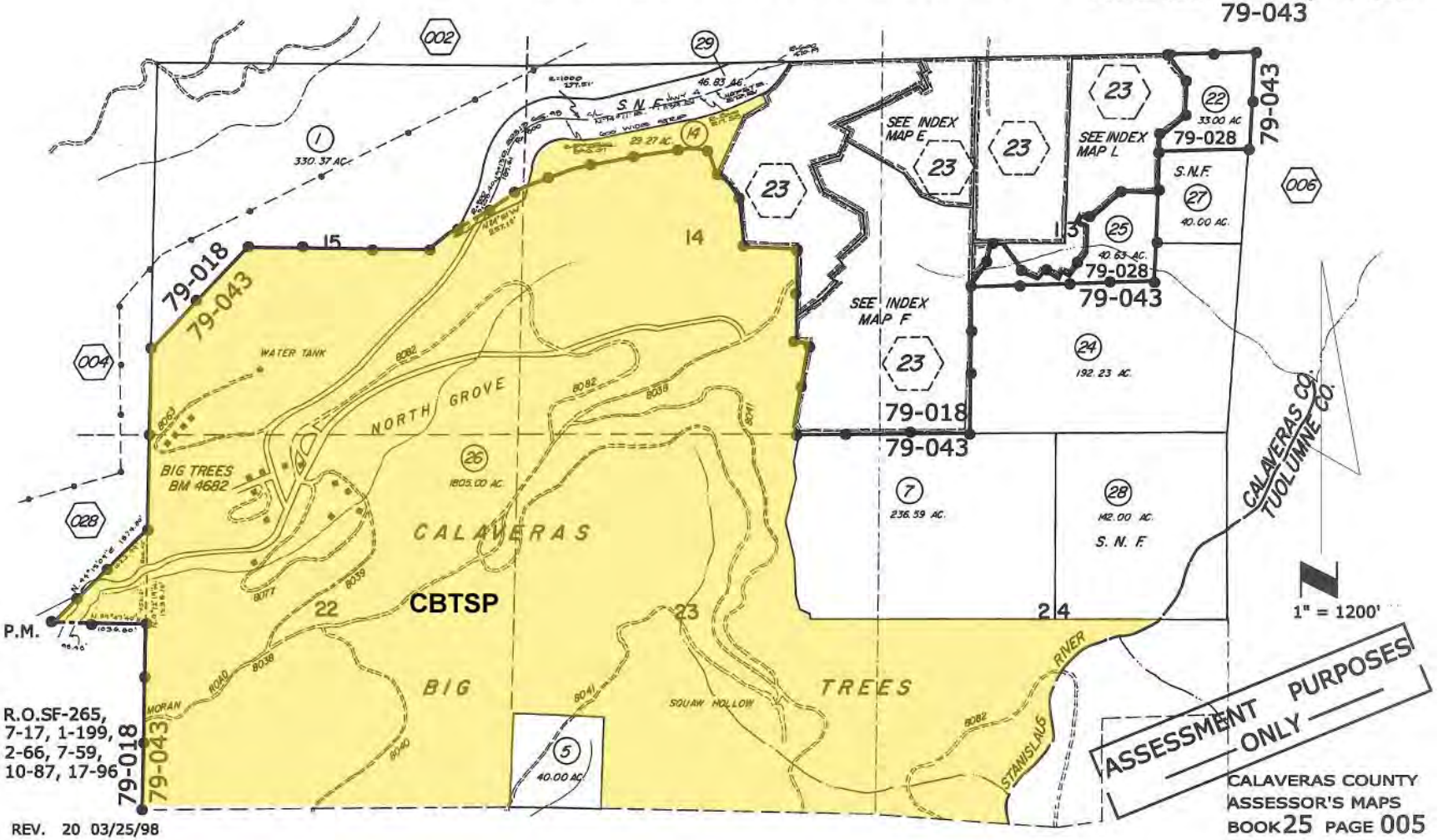
# Calaveras Big Trees State Park
# Big Tree Creek Watershed Forest Restoration

Nathanial Wigington
August 25, 2015
NAD83 CA Teale Albers



# T.5N., R.15E. M.D.M. SECS. 13-15, 22-24

TAX AREA CODE 79-018, 79-028
79-043




R.O.SF-265,
7-17, 1-199,
2-66, 7-59,
10-87, 17-96

REV. 20 03/25/98

CALAVERAS COUNTY
ASSESSOR'S MAPS
BOOK 25 PAGE 005

08.25.2015

08.25.2015

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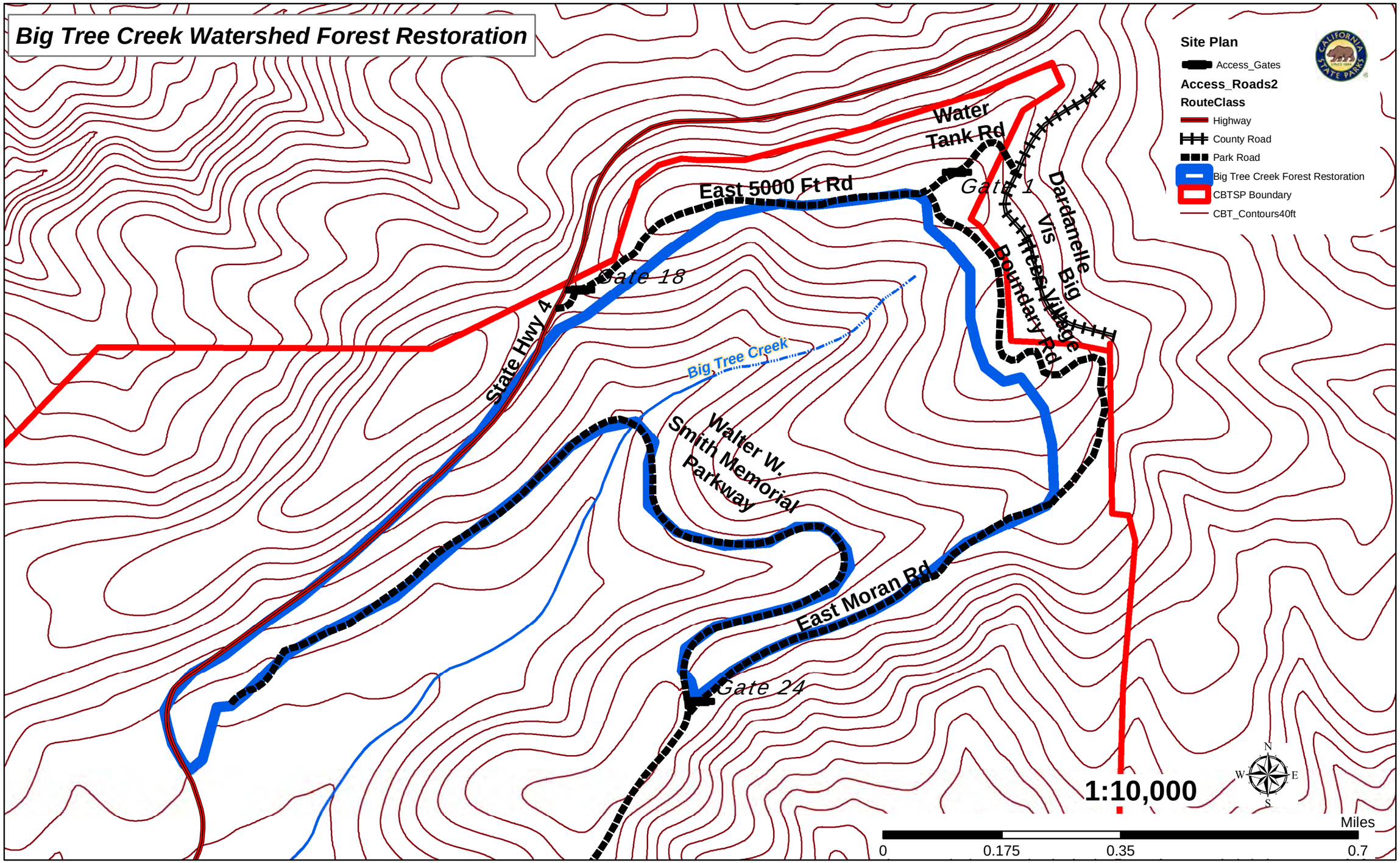
# *Site Plan*

The BTCW-FRP will restore 235 acres of mixed conifer forest within the upper portion of Big Tree Creek Watershed. Work will selectively thin the understory of small trees, shrubs, and selectively remove surface and ladder fuels. Work will focus on leaving patches of wildlife habitat. Excessive fuels removed will be burned in piles; bucked into rounds and hauled to the maintenance yard; chipped and hauled to the maintenance yard; and/or taken to a biomass utilization facility. All work will be done within the upper Big Tree Creek Watershed and down slope to the boundary of the North Grove of giant sequoias.

The site plan depicts the project area, access routes, and project orientation. The project area is approximately 10,233,261.22 square feet and is depicted on the site plan as blue polygon. The project is accessible by using the park's fire roads and the Walter W. Smith Memorial Parkway. The northeast portion of the project is accessed through Big Trees Village Boundary Fire Road (gate 1). This road is accessed by traveling north east on state route 4 and through the community of Big Trees Village, specifically by Dardanelle Vista Road. The southeast portion of the project is accessible by using East Moran Fire Road (gate 24).

The work will provide connect the SNC funded "North Grove Forest Restoration Project" and the California Conservation Corps and California State Park funded "Big Trees Village Shaded Fuel Break". The work will provide protection and buffer from wildfires to protect the watershed and its associated mixed conifer forest. The work will increase the amount of acreage restored for protection of the State's treasured giant sequoias and the community of Big Trees Village.

See next page for graphic:


Big Tree Creek Watershed Forest Restoration
Site Plan
Access_Gates
Access_Roads2
RouteClass
Highway
County Road
Park Road
Big Tree Creek Forest Restoration
CBTSP Boundary
CBT_Contours40ft
Water Tank Rd
East 5000 Ft Rd
Gate 1
Dardanelle
Big Vis
Trees Village
Boundary Rd
Gate 18
State Hwy 4
Big Tree Creek
Walter W. Smith Memorial Parkway
East Moran Rd
Gate 24
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# Calaveras Big Trees State Park
# Big Tree Creek Watershed Forest Restoration

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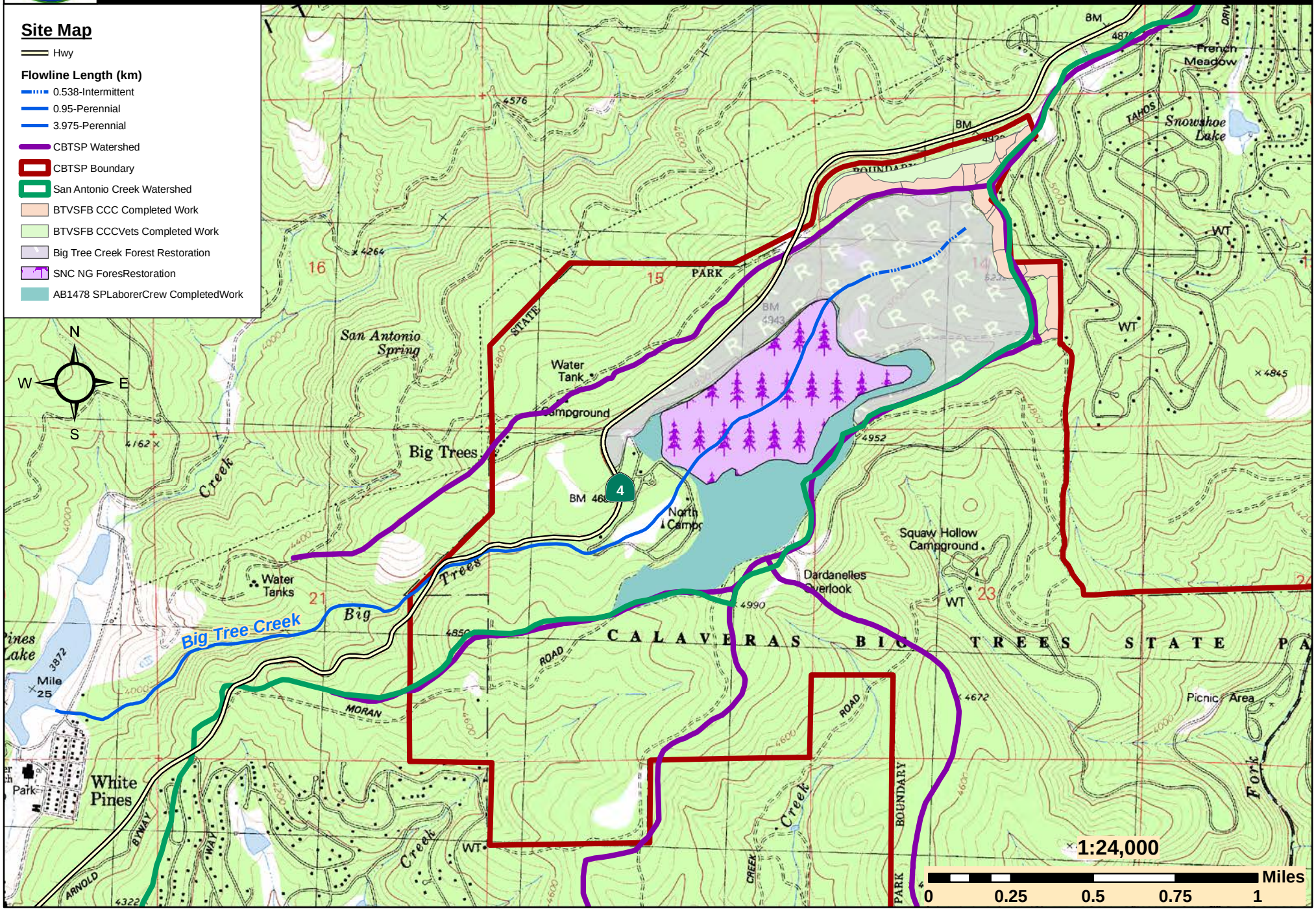
August 25, 2015
NAD83 CA Teale Albers



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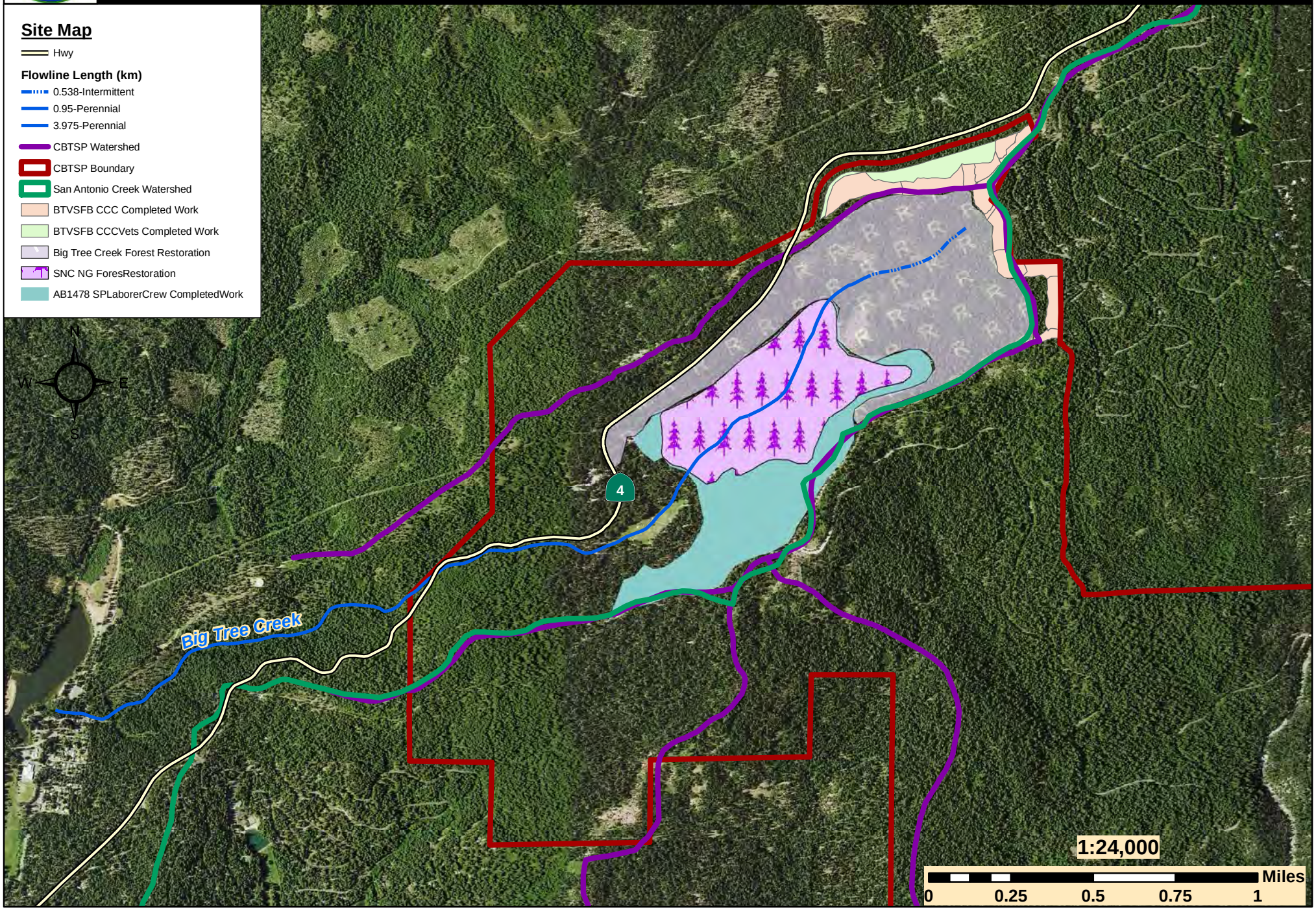
# Big Tree Creek Watershed Forest Restoration

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