

**Placer County Water Agency  
Middle Fork American River Project  
(FERC No. 2079)**

***DRAFT***

**TERR 2 - SPECIAL-STATUS PLANTS  
TECHNICAL STUDY REPORT - 2008**



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## TABLE OF CONTENTS

	Page
1.0 Introduction .....	1
2.0 Study Objectives .....	1
3.0 Study Implementation .....	2
3.1 Study Elements Completed .....	2
3.1.1 Developed Preliminary Information on Special-Status Plants in the Study Area .....	2
3.1.2 Conducted Special-Status Plant Surveys .....	2
3.1.3 Developed Final Information on Special-Status Plants in the Study Area .....	2
3.2 Variances from the TERR 2 - TSP .....	3
3.3 Outstanding Study Elements .....	3
3.4 Proposed Modifications to the TERR 2 - TSP .....	3
4.0 Extent of Study Area .....	4
5.0 Study Approach .....	4
5.1 Develop Preliminary Information on Special-Status Plants in the Study Area .....	4
5.2 Conduct Special-Status Plant Surveys .....	5
5.2.1 Terrestrial Special-Status Plant and Moss Surveys .....	5
5.2.2 Aquatic and Riparian Special-Status Plant and Moss Surveys .....	11
6.0 Study Results .....	11
6.1 Develop Preliminary Information on Special-Status Plants in the Study Area .....	11
6.2 Conduct Special-Status Plant Surveys .....	11
6.2.1 Terrestrial Special-Status Plant and Moss Surveys .....	12
6.2.2 Aquatic and Riparian Special-Status Plant and Moss Surveys .....	15
7.0 Literature Cited .....	15



### **List of Tables**

Table TERR 2-1.	Existing Project Facilities and Features.
Table TERR 2-2.	Project Recreation Facilities.
Table TERR 2-3.	Dispersed Concentrated Use Areas.
Table TERR 2-4.	Potential Project Betterments.
Table TERR 2-5.	Quantitative Geomorphic and Riparian Sampling Sites.
Table TERR 2-6.	Location of Special-Status Plant Populations at Existing Project Facilities and Features, Project Recreation Facilities, and Dispersed Concentrated Use Areas.
Table TERR 2-7.	Location of Special-Status Plant Populations in the Study Area around Hell Hole Reservoir for the Existing Project.
Table TERR 2-8.	Location of Special-Status Plant Populations at Potential Project Betterments.
Table TERR 2-9.	Location of Special-Status Plant Populations in the Study Area for Hell Hole Reservoir Associated with the Hell Hole Reservoir Seasonal Storage Increase Betterment.

### **List of Figures**

Figure TERR 2-1.	TERR 2 - TSP Study Objectives and Related Study Elements.
Figure TERR 2-2.	Study Area around Hell Hole Reservoir for the Existing Project.
Figure TERR 2-3.	Study Area for Hell Hole Reservoir Associated with the Hell Hole Reservoir Seasonal Storage Increase Betterment.

### **List of Maps**

Map TERR 2-1.	Location of Quantitative Geomorphic and Riparian Sampling Sites.
Map TERR 2-2.	Location of Special-Status Plant Populations in Relation to Existing Project Facilities and Features, Project Recreation Facilities, and Dispersed Concentrated Use Areas (6 sheets).
Map TERR 2-3.	Location of Special-Status Plant Populations Associated with Potential Project Betterments (5 sheets).

**List of Appendices**

- Appendix A. Description of Potential Project Betterments.
- Appendix B. Target Special-Status Plant Species for the TERR 2 Special-Status Plant and Moss Surveys.
- Appendix C. Terrestrial, Aquatic, and Riparian Plants and Mosses Identified in the Study Area.
- Appendix D. Photographs of Stebbins' Phacelia and Typical Habitat in the Study Area.
- Appendix E. California Natural Diversity Database Field Survey Forms.

## **1.0 INTRODUCTION**

This report describes surveys conducted by the Placer County Water Agency (PCWA) in accordance with the TERR 2 - Special-Status Plants Technical Study Plan (TERR 2 - TSP) for the Middle Fork American River Project (MFP or Project). The TERR 2-TSP was included in Supporting Document (SD) H of the Pre-Application Document (PAD) (PCWA 2007). Specifically, this report provides a detailed description of the methods and results of special-status plant studies completed in 2006-2008.

For the purposes of this report, a special-status species is defined as any plant species that is granted protection by a federal or state agency. Federally listed species granted status by the U.S. Fish and Wildlife Service (USFWS) under the Federal Endangered Species Act (ESA) include threatened (FT), endangered (FE), proposed threatened or endangered (FPT, FPE), candidate (FC), or listed species proposed for delisting (FPD). The U.S. Department of Agriculture - Forest Service (USDA-FS) grants status to Forest Service Sensitive (FSS) plants and mosses, as designated on lists developed by each forest (USDA-FS 2006a and 2006b).

Plant species that are granted status by the California Department of Fish and Game (CDFG) under the California Endangered Species Act (CESA) include state threatened (ST), endangered (SE), rare (SR), and California Species of Special Concern (CSC).

The California Native Plant Society (CNPS) also maintains a rating system for rare, threatened, or endangered plants in California. Under the California Environmental Quality Act (CEQA), special-status plants include species listed on CNPS Lists 1B and 2. The ratings included on those lists are: 1B - rare, threatened, or endangered in California and elsewhere, and 2 - rare in California but more common elsewhere.

## **2.0 STUDY OBJECTIVES**

The objectives of the special-status plant studies described in the TERR 2 - TSP are:

- Document special-status plants, fungi, and mosses at existing Project facilities and features, Project recreation facilities, and dispersed concentrated use areas identified by stakeholders.
- Document special-status aquatic and riparian plants and mosses at quantitative geomorphic and riparian sampling sites in bypass reaches and the peaking reach.
- Document special-status plant species, fungi, and mosses at potential Project betterments, including new facilities, roads, and trails; staging areas and disposal sites; and new inundation areas.

Figure TERR 2-1 shows the TERR 2 - TSP study objectives and the study elements associated with each objective. It also shows where information developed is documented.

### **3.0 STUDY IMPLEMENTATION**

Study elements described in the TERR 2 - TSP were initiated in 2006 and were completed in 2008. In 2006, existing data on special-status plants and mosses in the study area was compiled. Field studies to document terrestrial, aquatic, and riparian special-status plants and mosses were conducted in 2006-2008. Study elements that have been completed are discussed further below.

#### **3.1 STUDY ELEMENTS COMPLETED**

##### **3.1.1 Developed Preliminary Information on Special-Status Plants in the Study Area**

- Reviewed existing technical data to obtain information on each special-status plant known to occur or potentially occurring in the watershed including status, blooming period or fertile period, habitat, and location of occurrence.
- Developed a list of target special-status plant species to be included in the TERR 2 special-status plant surveys.
- Conducted agency consultation to obtain approval of the target special-status plant species list.

##### **3.1.2 Conducted Special-Status Plant Surveys**

- Determined the appropriate timing for conducting field surveys through consultation with the MFP Terrestrial Working Group (TWG) and monitoring of reference populations.
- Conducted field surveys for special-status plants and mosses in the study area at existing Project facilities and features, Project recreation facilities, and dispersed concentrated use areas.
- Conducted field surveys for special-status plants and mosses in the study area at potential Project betterments.
- Conducted field surveys for aquatic and riparian special-status plants and mosses at quantitative geomorphic and riparian sampling sites in bypass and peaking reaches.

##### **3.1.3 Developed Final Information on Special-Status Plants in the Study Area**

- Developed tables and maps documenting the location and extent of special-status plants and mosses in the study area at existing Project facilities and features, Project recreation facilities, and dispersed concentrated use areas.
- Developed tables and maps documenting the location and extent of special-status plants and mosses in the study area at potential Project betterments.

- Prepared and submitted California Natural Diversity Database Field Survey Forms for each special-status plant population identified.

### **3.2 VARIANCES FROM THE TERR 2 - TSP**

All studies were conducted in accordance with the TERR 2 - TSP with the following exception. The TERR 2-TSP stated that special-status fungi would be included as part of special-status plant surveys. Special-status fungi identified as potentially occurring in the study area, based on literature review and agency consultation, include red-pored bolete (*Boletus pulcherrimus* (FSS)), branched collybia (*Dentrocollybia racemosa* (FSS)), and olive phaeocollybia (*Phaeocollybia olivacea* (FSS)). These sensitive species are found only in mature mixed-conifer forests. However, based on a review of vegetation community maps developed for the TERR 1 - TSP, it was determined that mature mixed conifer forest habitat is not present in the study area where maintenance activities occur or where potential Project betterments would be constructed. This information was presented to the TWG on March 3, 2008. Using this information, the TWG determined that it would not be necessary to include fungi in the special-status plant surveys conducted for the TERR 2 - TSP.

### **3.3 OUTSTANDING STUDY ELEMENTS**

There are no outstanding study elements. However, pursuant to the TERR 2 - TSP, if additional Project facilities and features, Project recreation facilities, or dispersed concentrated use areas are identified in the future, then these areas will be surveyed consistent with the TSP.

### **3.4 PROPOSED MODIFICATIONS TO THE TERR 2 - TSP**

There are no proposed modifications to the TERR 2 - TSP.

## 4.0 EXTENT OF STUDY AREA

The study area for the documentation of special-status plants and mosses includes:

<b>Study Area</b>	<b>Existing Project Facilities and Features, Project Recreation Facilities, and Dispersed Concentrated Use Areas Identified by Stakeholders</b>
10 feet	<ul style="list-style-type: none"> <li>▪ on either side of trails</li> </ul>
20 feet	<ul style="list-style-type: none"> <li>▪ around the perimeter of the large reservoirs, medium reservoirs, and diversion pools</li> <li>▪ outside the perimeter fence of powerhouses, switchyards, and substations</li> <li>▪ around ancillary support facilities and Project fences</li> </ul>
30 feet	<ul style="list-style-type: none"> <li>▪ on either side of penstocks, valve houses, and removable sections</li> <li>▪ around gaging stations and weirs</li> <li>▪ on either side of communication lines, powerlines, photovoltaic poles and lines, and roads and access points</li> </ul>
60 feet	<ul style="list-style-type: none"> <li>▪ around intakes, gatehouses, surge tanks, adits, portals, microwave reflectors, radio towers, sediment disposal areas, and drop inlets</li> </ul>
100 feet	<ul style="list-style-type: none"> <li>▪ around Project recreation facilities and dispersed concentrated use areas</li> </ul>
<b>Study Area</b>	<b>Potential Project Betterments</b>
100 feet	<ul style="list-style-type: none"> <li>▪ around new facilities, roads, and trails; staging areas and disposal sites; and new inundation areas</li> </ul>

Refer to Tables TERR 2-1 through TERR 2-4 for a list of Project facilities and features, Project recreation facilities, and dispersed concentrated use areas included in the study area for documentation of special-status plants and mosses.

The study area for the documentation of aquatic and riparian special-status plants and mosses also includes quantitative geomorphic and riparian sampling sites in bypass streams and peaking reaches (Table TERR 2-5 and Map TERR 2-1).

## 5.0 STUDY APPROACH

This section describes the study approach used to document special-status plants in the study area.

### 5.1 DEVELOP PRELIMINARY INFORMATION ON SPECIAL-STATUS PLANTS IN THE STUDY AREA

As part of the development of the PAD, the following sources were reviewed for information on special-status plants in the Middle Fork American River (MFAR) watershed:

- USDA-FS survey data for the Eldorado and Tahoe national forests
- CNPS's Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS 2007)
- CDFG California Natural Diversity Database (CNDDB) (CDFG 2007)

- USDA-FS Regional Forester's List of Sensitive Plant and Animal Species for Region 5 (USDA-FS 1998)
- Sensitive Plants of the Eldorado National Forest (USDA-FS 2006a)
- Tahoe National Forest Sensitive Plants and Fungi (USDA-FS 2006b)
- USFWS Species List (USFWS 2007)
- Eldorado National Forest Land and Resource Management Plan (USDA-FS 1990a)
- Tahoe National Forest Land and Resource Management Plan (USDA-FS 1990b)
- Sierra Nevada Forest Plan Amendment (USDA-FS 2004)

These sources were reviewed to obtain information on the status, blooming period or fertile period, and habitat of special-status plants or mosses potentially occurring in the MFP. Information on documented occurrences of these plants within the MFP was also obtained from the above sources. This information was provided as Table 7-1 in SD F of the PAD (PCWA 2007). Table 7-1 was reviewed and refined in consideration of additional site- and species-specific information provided by the TWG for the purpose of this report. This revised table represented the list of target special-status species for the TERR 2 surveys.

## **5.2 CONDUCT SPECIAL-STATUS PLANT SURVEYS**

Field surveys were conducted to document the presence of special-status plants in the study area. The surveys included terrestrial special-status plant and moss surveys, conducted in 2008, and aquatic and riparian special-status plant and moss surveys, conducted in 2006 and 2007. The following describes methods implemented for each survey.

### **5.2.1 Terrestrial Special-Status Plant and Moss Surveys**

Terrestrial special-status plant and moss surveys were conducted in June, July, and August 2008. This section provides a description of the survey methods implemented and data analysis conducted for terrestrial special-status plants at existing Project facilities and features, Project recreation facilities, and dispersed concentrated use areas. It also includes a description of additional survey methods and data analyses used for potential Project betterments.

#### **Survey Timing**

Surveys for special-status plants must be conducted at the proper time of year when rare, threatened, and endangered plants are both evident and identifiable (i.e., when the plants are flowering). Therefore, appropriate timing for conducting special-status plant surveys was determined based on a literature review of blooming periods for species potentially occurring in the study area. Based on the literature review, it was determined



that two surveys, an early season survey in May/June and a late season survey in July/August, would be necessary.

The survey timing was further refined in consultation with resource agencies through monitoring of known special-status plant populations occurring in the ENF and TNF. Reference population monitoring visits were conducted on May 7 and July 21, 2008 and were attended by Susan Durham and Annie Walker of USDA-FS, as well as the lead botanist and technical manager for the TERR-2 study.

During the May 7<sup>th</sup> monitoring visit, reference populations of Pleasant Valley mariposa lily (*Calochortus clavatus* var. *avius* - FSS, 1B.2), saw-toothed lewisia (*Lewisia serrata* - FSS, 1B.1), and Stebbins' phacelia (*Phacelia stebbinsi* - FSS, 1B.2) were observed. Based on the site visit, it was determined in consultation with resource agencies that mid-to-late June was the appropriate time period to conduct early season surveys.

Reference populations of subalpine fireweed (*Epilobium howellii* - FSS, 1B.3) were visited on July 21, 2008. Based on the site visit, it was determined in consultation with resource agencies that late July/early August was the appropriate time period to conduct late season surveys.

### **Existing Project Facilities and Features, Project Recreation Facilities and Dispersed Concentrated Use Areas**

All special-status plant surveys were conducted in accordance with the *Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities* (CDFG 2000). Two teams of two botanists searched for and recorded the occurrence of common and special-status plants in the study area using various systematic field techniques (e.g., zig-zag patterns, random meandering, and linear transects) as appropriate. Surveys were conducted only in accessible areas.

Surveys were floristic in nature, and nomenclature was based on The Jepson Manual (Hickman 1993). All plant species observed during field surveys were recorded and identified to the level necessary to determine whether they were a special-status plant, or a plant species with unusual or significant range extensions. Voucher specimens for non-listed plant species that were of interest to resource agencies were donated to the USDA-FS Herbarium. Samples of all moss species observed were collected and labeled with the date and location, as well as a description of the habitat where the moss was growing. All mosses were later identified to species by a bryologist.

For each special-status plant or moss population identified, the following data were recorded on datasheets developed for the TERR 2 surveys:

- Date
- General location
- Geographic Positioning System (GPS) location coordinates (in North American Datum (NAD) 83)



- Photograph number
- Vegetation community
- Population size (i.e., polygon size)
- Approximate number of individuals

When a special-status plant or moss species was identified on the perimeter of the study area, the study area was expanded to document the extent of the population. The location of each special-status species was mapped on a 7.5-minute USGS quadrangle. California Natural Diversity Database Field Survey Forms for each population identified were completed and submitted to CDFG.

During the special-status plant and moss surveys conducted at Hell Hole Reservoir, it was determined that one special-status plant, Stebbins' phacelia (*Phacelia stebbinsii* - FSS, CNPS 1B.2), was locally common in appropriate habitat along the shoreline of the reservoir. Surveyors searched accessible areas around the reservoir for Stebbins' phacelia and its habitat. Because the Stebbins' phacelia populations were often large, and extended into steep and inaccessible terrain, the following methods were implemented to document Stebbins' phacelia around the shoreline of Hell Hole Reservoir:

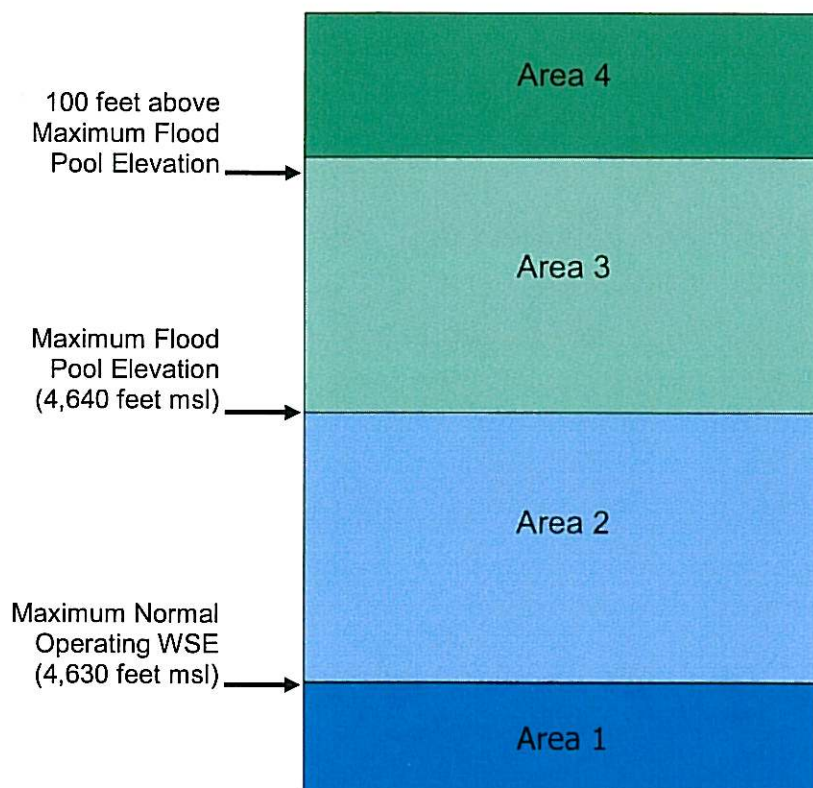
- GPS location information was obtained
- The extent of the population was marked on aerial photographs of the reservoir
- In cases where the population extended to inaccessible areas:
  - Population polygons were extended to include all adjacent appropriate habitat
  - The average density of the population (i.e., number of individuals per square foot) was estimated based on the number of individuals observed in accessible areas

Data obtained from field surveys on the location and extent of special-status plant populations were processed and developed into maps. Maps were developed by overlaying GIS layers of the location of special-status plant populations and existing Project facilities and features, Project recreation facilities, and dispersed concentrated use areas on full color orthophotographs of the study area. Tables were then developed listing each special-status plant population, its size (i.e., area in square feet and acres), the estimated number of individuals in the population, and associated existing Project facilities and features, Project recreation facilities, and/or dispersed concentrated use areas.

Additional analyses were conducted to provide information on the location and number of special-status plants and mosses occurring at various elevations along the shoreline of Hell Hole Reservoir. First, GIS shapefiles of each special-status plant population were overlain on contour maps of the bed and shoreline of Hell Hole Reservoir. Contour maps of the lower (westernmost) portion of the reservoir were created using an

interpolation of USGS 7.5 minute quadrangle contours. Contour maps of the upper (easternmost) portion of the reservoir were developed from topographic measurements collected by Air Maps USA in fall 2007 using aerial photogrammetric mapping techniques supported by ground control surveys.

The size (i.e., area in square feet and acres) of each special-status plant population (or portion thereof) and the number of individuals were then calculated in relation to contour lines representing various elevations associated with current Project operations. A schematic of specific elevations around Hell Hole Reservoir associated with the existing Project is provided as Figure 2-2.



**Figure TERR 2-2. Study Area around Hell Hole Reservoir for the Existing Project.**

Under the existing Project, the Hell Hole Dam Spillway is an uncontrolled channel. The elevation of the spillway crest and the maximum normal operating Water Surface Elevation (WSE) of Hell Hole Reservoir is 4,630 feet mean sea level (msl) and the maximum flood pool elevation is 4,640 feet msl. Calculations of the area of each population and number of special-status plant and moss individuals located at different elevations under the existing Project are grouped as follows:

- **Area 1** includes special-status plant and moss populations (or portions of populations) occurring at or below the current maximum normal operating WSE (4,630 feet msl).
- **Area 2** includes special-status plant and moss populations (or portions of

populations) occurring from the current maximum normal operating WSE (4,630 feet msl) to the maximum flood pool elevation (4,640 feet msl).

- **Area 3** includes special-status plant and moss populations (or portions of populations) occurring from the maximum flood pool elevation (4,640 feet msl) to approximately 100 feet above the normal maximum operating WSE.
- **Area 4** includes those portions of the special-status plant and moss populations intersecting Areas 1, 2, and/or 3 that extend beyond Area 3 (100 feet above the maximum flood pool elevation).

### **Potential Project Betterments**

PCWA is evaluating three potential Project betterments including

- Hell Hole Reservoir Seasonal Storage Increase
- French Meadows Powerhouse Capacity Upgrade
- Ralston Powerhouse Capacity Upgrade

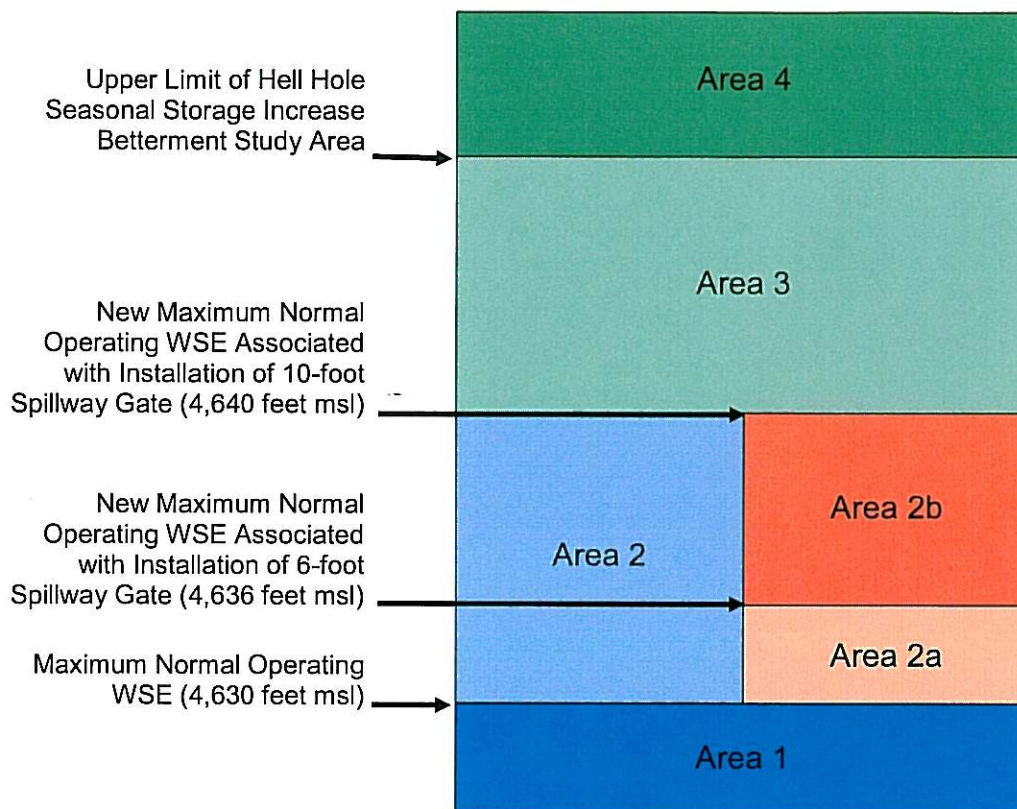
Refer to Appendix A for a brief description of these potential Project betterments. A detailed description of each potential Project betterment is provided in SD C of the PAD. Provided below is a description of survey and data analyses implemented for the three potential Project betterments, including a description of additional analyses conducted specifically for the Hell Hole Reservoir Seasonal Storage Increase Betterment.

#### *Hell Hole Reservoir Seasonal Storage Increase Betterment*

Special-status plant survey methods for the Hell Hole Reservoir Seasonal Storage Increase Betterment are the same as those described for surveys at existing Project facilities and features, Project recreation facilities, and dispersed concentrated used areas.

Additional analyses were conducted to provide information on the location and number of special-status plants and mosses within the study area for the Hell Hole Reservoir Seasonal Storage Increase Betterment. Under the proposed betterment, PCWA would install a 6- or 10-foot inflatable gate at the Hell Hole Dam Spillway to increase the storage capacity of the reservoir. The acreage of each special-status plant population (or portion thereof) and the number of individuals were calculated in relation to contour lines representing various elevations that could be affected (i.e., seasonally inundated) by installation of 6- or 10-foot spillway gates. A schematic showing elevations associated with installation of 6- or 10-foot spillway gates in Hell Hole Dam is provided as Figure 2-3.





**Figure TERR 2-3. Study Area for Hell Hole Reservoir Associated with the Hell Hole Reservoir Seasonal Storage Increase Betterment.**

Calculations of the area of each population and number of individuals in each population associated with the Hell Hole Reservoir Seasonal Storage Increase Betterment are grouped as follows:

- **Area 2a** includes special-status plant and moss populations (or portions of populations) occurring from the current maximum normal operating WSE of 4,630 feet to the potential new maximum normal operating WSE of 4,636 associated with the installation of a 6-foot spillway gate.
- **Area 2b** includes additional special-status plant and moss populations (or portions of populations) occurring from 4,636 feet msl to the potential new maximum normal operating WSE of 4,640 associated with the installation of a 10-foot spillway gate. The total reservoir area affected by installation of a 10-foot spillway gate includes both Areas 2a and 2b.

#### *French Meadows Powerhouse Capacity Upgrade Betterment*

Special-status plant survey methods for the French Meadows Powerhouse Capacity Upgrade Betterment are the same as those described for surveys at existing Project

facilities and features, Project recreation facilities, and dispersed concentrated used areas.

### *Ralston Powerhouse Capacity Upgrade Betterment*

Special-status plant survey methods for the Ralston Powerhouse Capacity Upgrade Betterment are the same as those described for surveys at existing Project facilities and features, Project recreation facilities, and dispersed concentrated used areas.

## **5.2.2 Aquatic and Riparian Special-Status Plant and Moss Surveys**

Aquatic and riparian special-status plant and moss surveys were conducted at quantitative geomorphic and riparian sampling sites along bypass and peaking reaches in August through October 2006 and August and September 2007. Surveys were conducted in accordance with the *Guidelines for Assessing the Effects of Proposed Project on Rare, Threatened, and Endangered Plants and Natural Communities* (CDFG 2000). Documentation of special-status plants and mosses was consistent the methods described above for terrestrial special-status plants and mosses at existing Project facilities and features, recreation areas, and dispersed concentrated use areas.

## **6.0 STUDY RESULTS**

Provided below are the results of documentation of terrestrial, aquatic, and riparian special-status plants in the study area, including the results of special-status plant surveys and development of tables and maps.

### **6.1 DEVELOP PRELIMINARY INFORMATION ON SPECIAL-STATUS PLANTS IN THE STUDY AREA**

Based on a literature review and consultation with the TWG, 48 special-status plant and moss species were determined to have the potential to occur in the vicinity of the MFP. Of these 48 species, two special-status plant species were documented as historically occurring within FERC boundaries—Red Hills soaproot (*Chlorogalum grandiflorum*) and Stebbins' phacelia (*Phacelia stebbinsi*). These 48 special-status plant species were determined by the TWG to be the target species for the TERR 2 surveys. The list of target special-status plant species is provided in Appendix B.

### **6.2 CONDUCT SPECIAL-STATUS PLANT SURVEYS**

No special-status plants or mosses listed under the federal ESA or CESA were documented during the terrestrial, aquatic, or riparian special-status plant surveys conducted in the study area. Only one special-status plant, Stebbins' phacelia (FSS, CNPS 1B.2), was detected in the vicinity of the MFP. Stebbins' phacelia is one of the two plants previously known to occur in the vicinity of the MFP within FERC boundaries. The other previously recorded special-status plant, Red Hills soaproot, was not detected during the TERR 2 surveys.

Detailed survey results are provided below. Refer to Appendix C for a comprehensive list of common and special-status plants and mosses identified during the terrestrial, aquatic, and riparian special-status plant surveys.

### **6.2.1 Terrestrial Special-Status Plant and Moss Surveys**

Fifty-six populations of Stebbins' phacelia (FSS, CNPS 1B.2) occupying approximately 123 acres were identified during terrestrial special-status plant and moss surveys. Of these 56 populations, 3 populations (approximately 2.6 acres) lie outside the TERR 3 study area and are therefore not addressed further in this document. Of the remaining 53 populations, 48 populations are located in the study area for existing Project facilities and features, Project recreation facilities, and dispersed concentrated use areas (refer to Tables TERR 2-1 through 2-3), and 38 populations are located in the study area for potential Project betterment facilities (33 populations around Hell Hole Reservoir intersect both the study area for existing Project facilities and features and the study area for potential Project betterments).

In general, Stebbins' phacelia populations were found within chaparral and oak woodland habitats with well-drained, rocky, granitic soils or in cracks in large granite outcroppings. These populations were often found in association with rat-tail fescue (*Vulpia myuros*) and cheatgrass (*Bromus tectorum*) (both non-native grass species common throughout the study area), and mountain jewelflower (*Streptanthus tortuosus* ssp. *orbiculatus*). Appropriate habitat for Stebbins' phacelia was especially prevalent along the shoreline of Hell Hole Reservoir. In this vicinity, Stebbins' phacelia was widespread, with densities estimated at approximately 0.5 to 1.0 individual per square foot. Photographs of representative populations of Stebbins' phacelia and typical habitat are provided in Appendix D. California Natural Diversity Database Field Survey Forms submitted to CDFG are provided as Appendix E.

#### **Existing Project Facilities and Features, Project Recreation facilities, and Dispersed Concentrated Use Areas**

A total of 48 populations of Stebbins' phacelia occupying approximately 112 acres were identified within the study area at existing Project facilities and features, Project recreation facilities, and dispersed concentrated use areas. Provided below is a summary of the location and size of these populations.

- Ten populations at Project roads
- One population at Duncan Creek Diversion Pool
- Three populations at Project recreation facilities
- One population at French Meadows Reservoir/Duncan Creek-Middle Fork Tunnel Gatehouse
- Thirty-three populations around Hell Hole Reservoir, including:

- Hell Hole Middle Fork Tunnel Gatehouse Road
- French Meadows Powerhouse Road
- Hell Hole Dam and Outlet Works
- Upper Hell Hole Campground
- Grey Horse Dispersed Concentrated Use Area

Maps showing the location and extent of Stebbins' phacelia populations in the study area for existing Project facilities and features, Project recreation facilities, and dispersed concentrated use areas are provided as Maps TERR 2-2 and 2-2a through 2-2e. Refer to Table TERR 2-6 for a list of each Stebbins' phacelia population, its area, the estimated number of individual plants in each population, and the associated existing Project facilities and features, Project recreation facilities, and/or dispersed concentrated use areas.

Table TERR 2-7 provides an analysis of Stebbins' phacelia populations that are located at different elevations of Hell Hole Reservoir:

- **Area 1** (which includes those portions of special-status plant populations occurring at or below the current maximum normal operating WSE of 4,630 feet msl) includes a portion of one Stebbins' phacelia population occupying 0.41 acres and containing approximately 9,000-18,000 individuals.
- **Area 2** (which includes those portions of special-status plant populations occurring from the maximum normal operating WSE to the maximum flood pool elevation at 4,640 feet msl) includes portions of 30 Stebbins' phacelia populations occupying approximately 7 acres and containing approximately 153,000-306,000 individuals.
- **Area 3** (which includes those portions of special-status plant populations occurring from the maximum flood pool elevation to the upper limit of the study area) includes portions of 31 Stebbins' phacelia populations occupying approximately 46 acres and containing approximately 997,000-1,994,000 individuals.
- **Area 4** (which includes those portions of the special-status plant and moss populations intersecting Areas 1, 2, and/or 3 that extend beyond Area 3) includes portions of 24 Stebbins' phacelia populations occupying approximately 52 acres and containing approximately 1,136,500-2,273,000 individuals.

### **Potential Project Betterments**

A total of 38 populations of Stebbins' phacelia were identified in the study area for the potential Project betterments. Provided below are the results of surveys and data analyses conducted for each Project betterment.



### *Hell Hole Reservoir Seasonal Storage Increase Betterment*

Thirty-three populations of Stebbins' phacelia were identified in the study area for the Hell Hole Reservoir Seasonal Storage Increase Betterment. Maps TERR 2-3a - 2-3c show the location of these populations of Stebbins' phacelia. Table TERR 2-8 lists each Stebbins' phacelia population, its area, the estimated number of individual plants in each population, and associated Hell Hole Reservoir Seasonal Storage Increase Betterment facilities.

Table TERR 2-9 provides an analysis of Stebbins' phacelia populations at different elevations associated with the installation of a 6-foot or 10-foot spillway gate as part of the Hell Hole Reservoir Seasonal Storage Increase Betterment.

- **Area 2a** (which includes those portions of special-status plant populations occurring from the current maximum normal operating WSE of 4,630 feet msl up to the new potential maximum normal operating WSE of 4,636 feet msl resulting from installation of a 6-foot spillway gate) includes 30 Stebbins' phacelia populations occupying 2.5 acres and containing approximately 54,000-108,000 individuals.
- **Area 2b** (which includes those portions of special-status plant populations occurring between 4,636 feet msl and the new potential maximum normal operating WSE of 4,640 feet msl resulting from the installation of a 10-foot spillway gate in Hell Hole Dam) includes 29 populations of Stebbins phacelia occupying 4.5 and containing 99,000-198,000 individuals. The total reservoir area affected by installation of a 10-foot spillway gate includes both Areas 2a and 2b.

### *French Meadows Powerhouse Capacity Upgrade Betterment*

Five populations of Stebbins' phacelia were identified along Forest Road 14N09A, which would be widened as part of the potential French Meadows Powerhouse Capacity Upgrade Betterment. These populations occupy 8 acres and contain approximately 178,000 to 356,000 individuals. Refer to Map TERR 2-3d for the location of these populations. Table TERR 2-8 lists each Stebbins' phacelia population, its area, the estimated number of individual plants in each population, and associated French Meadows Powerhouse Capacity Upgrade Betterment facilities.

### *Ralston Powerhouse Capacity Upgrade Betterment*

No special-status plant populations were identified in the study area for the potential Ralston Powerhouse Capacity Upgrade Betterment.



### 6.2.2 Aquatic and Riparian Special-Status Plant and Moss Surveys

No special-status plants or mosses were identified during the aquatic and riparian special-status plant surveys. A list of common aquatic and riparian plants recorded during these surveys are included in Appendix C.

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## TABLES

**Table TERR 2-1. Existing Project Facilities and Features.**

<b>Dams, Reservoirs, and Diversion Pools</b>	
<b>Large Dams</b>	
French Meadows Dam and Outlet Works	
Hell Hole Dam and Outlet Works	
<b>Medium Dams</b>	
Middle Fork Interbay Dam	
Ralston Afterbay Dam	
<b>Small Dams</b>	
Duncan Creek Diversion Dam	
North Fork Long Canyon Diversion Dam	
South Fork Long Canyon Diversion Dam	
<b>Large Reservoirs</b>	
French Meadows Reservoir	
Hell Hole Reservoir	
<b>Medium Reservoirs</b>	
Middle Fork Interbay	
Ralston Afterbay	
<b>Small Diversion Pools</b>	
Duncan Creek Diversion Pool	
North Fork Long Canyon Diversion Pool	
South Fork Long Canyon Diversion Pool	
<b>Water Conveyance Systems</b>	
<b>Tunnels</b>	
Duncan Creek-Middle Fork Tunnel	
French Meadows-Hell Hole Tunnel	
Hell Hole - Middle Fork Tunnel	
Middle Fork - Ralston Tunnel	
Ralston - Oxbow Tunnel	
<b>Diversion Pipes and Drop Inlets</b>	
North Fork Long Canyon Diversion Pipe and Drop Inlet	
South Fork Long Canyon Diversion Pipe and Drop Inlet	
<b>Surge Shafts and Adits</b>	
Brushy Canyon Adit	
Hell Hole - Middle Fork Tunnel Surge Shaft and Tank	
Middle Fork - Ralston Tunnel Surge Shaft and Tank	
<b>Removable Sections and Portals</b>	
Duncan Creek - Middle Fork Tunnel Portal	
French Meadows - Hell Hole Tunnel Removable Section	
Hell Hole - Middle Fork Tunnel Removable Section	
Middle Fork - Ralston Tunnel Removable Section	
North Fork Long Canyon Crossing Removable Section	
<b>Intakes and Gatehouses</b>	
Duncan Creek - Middle Fork Tunnel Intake	
French Meadows - Hell Hole Tunnel Gatehouse	
French Meadows - Hell Hole Tunnel Intake	
Hell Hole - Middle Fork Tunnel Gatehouse	
Hell Hole - Middle Fork Tunnel Intake	
Middle Fork - Ralston Tunnel Intake and Gatehouse	
Ralston - Oxbow Tunnel Intake	

**Table TERR 2-1. Existing Project Facilities and Features (continued).**

<b>Water Conveyance Systems (continued)</b>	
<b>Penstocks and Valve Houses</b>	
French Meadows Powerhouse Penstock and Butterfly Valve House	
Middle Fork Powerhouse Penstock and Butterfly Valve House	
Ralston Powerhouse Penstock and Butterfly Valve House	
<b>Powerhouses, Switchyards, and Substations</b>	
French Meadows Powerhouse and Switchyard	
Hell Hole Powerhouse	
Middle Fork Powerhouse and Upper and Lower Switchyards	
Ralston Powerhouse and Switchyard	
Oxbow Powerhouse and Switchyard	
Hell Hole Substation	
<b>Gaging Stations and Weirs</b>	
<b>Stream Gages and Weirs</b>	
Duncan Creek Gage and Weir above Diversion Dam (USGS Gage and Weir No. 11427700)	
Duncan Creek Gage and Weir below Diversion Dam (USGS Gage and Weir No. 11427750)	
Middle Fork American River Gage and Weir below French Meadows Dam (USGS Gage and Weir No. 11427500)	
Middle Fork American River Gage at Interbay Dam (USGS Gage No. 11427770)	
Middle Fork American River Gage above Middle Fork Powerhouse (USGS Gage No. 11427760)	
Middle Fork American River Gage below Oxbow Powerhouse (USGS Gage No. 11433300)	
North Fork Long Canyon Gage and Weir at Diversion Dam (USGS Gage and Weir No. 11433085)	
South Fork Long Canyon Gage and Weir at Diversion Dam (USGS Gage and Weir No. 11433065)	
Rubicon River Gage and Weir below Hell Hole Dam (USGS Gage and Weir No. 11428800)	
<b>Diversion Gages</b>	
North Fork Long Canyon Gage at Diversion Dam (USGS Gage No. 11433080)	
South Fork Long Canyon Gage at Diversion Dam (USGS Gage No. 11433060)	
<b>Reservoir Gages</b>	
French Meadows Reservoir Gage (USGS Gage No. 11427400)	
French Meadows Reservoir Staff Gage	
Hell Hole Reservoir Gage (USGS Gage No. 11428700)	
Hell Hole Reservoir Staff Gage	
Middle Fork Interbay Reservoir Gage	
Ralston Afterbay Reservoir Gage	
<b>Powerhouse Gages</b>	
French Meadows Powerhouse Gage (USGS Gage No. 11427200)	
Middle Fork Powerhouse Gage (USGS Gage No. 11428600)	
Oxbow Powerhouse Gage (USGS Gage No. 11433212)	
Ralston Powerhouse Gage (USGS Gage No. 11427765)	
<b>Leakage Weirs</b>	
French Meadows Dam Leakage Weirs Nos. 1-6	
Hell Hole Dam Leakage Weir	
<b>Project Communication Lines and Powerlines</b>	
<b>French Meadows Area</b>	
French Meadows Dam Generator Building to French Meadows Dam Outlet Works Powerline	
French Meadows Dam Generator Building to French Meadows Dam Spillway Gates Powerline	

**Table TERR 2-1. Existing Project Facilities and Features (continued).**

<b>Project Communication Lines and Powerlines (continued)</b>	
<b>Hell Hole Area</b>	
French Meadows Powerhouse to French Meadows Powerhouse Penstock and Butterfly Valve House Communication Line/Powerline	
French Meadows Powerhouse and Switchyard to Hell Hole - Middle Fork Tunnel Gatehouse, Dormitory Facility, Operator's Cottages, and Hell Hole Powerhouse Communication Line/Powerline	
Dormitory and Cottages Water Supply Tank Powerline	
Hell Hole Powerhouse to Rubicon River Gage and Weir below Hell Hole Dam Communication Line/Powerline	
<b>Middle Fork Interbay Area</b>	
Middle Fork Powerhouse to Middle Fork Powerhouse Butterfly Valve House Communication Line/Powerline	
Middle Fork Powerhouse Butterfly Valve House to Radio Repeater near Hell Hole - Middle Fork Tunnel Surge Tank (underground) Communication Line/Powerline	
Middle Fork Powerhouse to Middle Fork - Ralston Tunnel Intake and Gatehouse Communication Line/Powerline	
Middle Fork Powerhouse to Middle Fork American River Gage above Middle Fork Powerhouse Communication Line/Powerline	
<b>Ralston - Oxbow Area</b>	
Ralston - Oxbow Tunnel Intake to Ralston Powerhouse Communication Line	
Ralston Powerhouse to Ralston Powerhouse Butterfly Valve House Communication Line/Powerline	
Ralston Afterbay Dam Generator Building to Ralston - Oxbow Tunnel Intake Communication Line/Powerline	
Oxbow Powerhouse to Ralston Afterbay Dam Generator Building Communication Line/Powerline	
<b>Photovoltaic Poles and Powerlines</b>	
Photovoltaic Poles and Powerline to Duncan Creek Gage above Diversion Dam	
Photovoltaic Pole and Powerline at Duncan Creek Gage below Diversion Dam	
Photovoltaic Pole and Powerline at Middle Fork American River Gage below French Meadows Dam	
Photovoltaic Pole and Powerline at Middle Fork American River Gage above Middle Fork Powerhouse	
Photovoltaic Pole and Powerline at North Fork Long Canyon Gage at Diversion Dam	
Photovoltaic Pole and Powerline at South Fork Long Canyon Gage at Diversion Dam	
Photovoltaic Pole at Middle Fork American River Gage below Oxbow Powerhouse	
<b>Microwave Reflectors and Radio Towers</b>	
Passive Microwave Reflector Station above Middle Fork Interbay	
Radio Communications Tower near French Meadows - Hell Hole Tunnel Gatehouse	
Radio Communications Tower and Repeater near Hell Hole - Middle Fork Tunnel Surge Shaft and Tank	
Passive Microwave Reflector Station above Ralston Afterbay	
<b>Disposal Sites</b>	
Duncan Diversion Dam Sediment Disposal Area	
North Fork Long Canyon Crossing Sediment Disposal Area	
Middle Fork Interbay Sediment Disposal Area	
Ralston Ridge Sediment Disposal Area	
Indian Bar Sediment Disposal Area	
<b>Ancillary Facilities</b>	
French Meadows Dam Generator Building	
French Meadows Dam Staging Area	
Dormitory Facility	
Dormitory and Cottages Water Supply Tank	

**Table TERR 2-1. Existing Project Facilities and Features (continued).**

<b>Ancillary Facilities (continued)</b>	
Hell Hole Staging Areas	
Operator Cottages and Shop	
Ralston Afterbay Dam Generator Building	
Storage Building at Middle Fork - Ralston Tunnel Surge Shaft and Tank	
Wabena Meadows Snow Course	
Miranda Cabin Snow Course	
Diamond Crossing Snow Course	
Talbot Camp Snow Course	
<b>Project Fences</b>	
<b>Slope Fences</b>	
French Meadows Powerhouse Penstock Rock Fence	
French Meadows Powerhouse Slope Fence	
Long Canyon Crossing Slope Fence	
Middle Fork Powerhouse Upper Switchyard Slope Fence	
Middle Fork Interbay Dam Slope Fence	
Oxbow Powerhouse Slope Fence	
Ralston Powerhouse Penstock and Butterfly Valve House Slope Fences	
Ralston Powerhouse Slope Fence	
<b>Public Safety Fences</b>	
Dormitory Facility Barrier Fence	
Hell Hole Dam General Parking Area Barrier Fence	
North Fork Long Canyon Crossing Removable Section Barrier Fence	
<b>Project Roads and Access Points</b>	
<b>Duncan Creek Area</b>	
Duncan Creek Diversion Intake Road and Diversion Pool Access Point	
Duncan Creek Diversion Dam Road	
Duncan Creek Diversion Pool Road and Access Point	
<b>French Meadows Area</b>	
Duncan Creek - Middle Fork Tunnel Portal Road and Spillway Access Point	
French Meadows - Hell Hole Tunnel Gatehouse Road	
French Meadows Dam Outlet Works and Leakage Weirs Road	
French Meadows Dam Staging Area Road	
Middle Fork American River Gage and Weir below French Meadows Dam Road	
<b>Hell Hole Area</b>	
Hell Hole Dam and Powerhouse Road and Spillway Southern Access Point	
Rubicon River Gage and Weir below Hell Hole Dam Road	
Hell Hole Dam Leakage Weir Road	
Hell Hole Dam Spillway Northern Access Point	
French Meadows - Hell Hole Tunnel Portal Road	
French Meadows Powerhouse Road	
Hell Hole - Middle Fork Tunnel Gatehouse Road	
Dormitory Facility Road	
Hell Hole Dam Spillway Discharge Channel Road	
<b>Long Canyon Area</b>	
North Fork Long Canyon Diversion North Road	
North Fork Long Canyon Diversion South Road	
North Fork Long Canyon Diversion Drop Inlet Road	



**Table TERR 2-1. Existing Project Facilities and Features (continued).**

<b>Project Roads and Access Points (continued)</b>	
<b>Long Canyon Area (continued)</b>	
South Fork Long Canyon Diversion and Drop Inlet Road	
North Fork Long Canyon Crossing Removable Section North Road and Parking Area	
North Fork Long Canyon Crossing Removable Section South Road	
<b>Middle Fork Interbay Area</b>	
Middle Fork Powerhouse Butterfly Valve House Road	
Middle Fork Powerhouse Penstock and Butterfly Valve House Road	
Middle Fork Interbay Dam and Powerhouse Road and Interbay Access Points	
Middle Fork Powerhouse Upper Switchyard Road	
<b>Ralston-Oxbow Area</b>	
Brushy Canyon Adit Road	
Oxbow Powerhouse Road	
Ralston Powerhouse Butterfly Valve House Road	
Ralston - Oxbow Tunnel Intake Road	
Ralston Afterbay Road and Boat Ramp	
Ralston Afterbay Dam Road and Afterbay Access Point	
Ralston Afterbay Sediment Removal Access Point	
<b>Project Trails</b>	
<b>Duncan Creek Area</b>	
Duncan Creek Diversion Dam North Trail	
Duncan Creek Diversion Dam South Trail	
Photovoltaic Poles and Powerline to Duncan Creek Gage above Diversion Dam Trail	
Duncan Creek Gage and Weir above Diversion Trail	
Duncan Creek Gage and Weir below Diversion Trail	
<b>French Meadows Area</b>	
Middle Fork American River Gage and Weir below French Meadows Dam Trail	
<b>Middle Fork Interbay Area</b>	
Middle Fork American River Gage above Middle Fork Powerhouse Trail	
Passive Microwave Reflector Station above Middle Fork Interbay Trail	
<b>Ralston Afterbay Area</b>	
Passive Microwave Reflector Station above Ralston Afterbay Trail	
Middle Fork American River Gage below Oxbow Powerhouse Trail	

**Table TERR 2-2. Project Recreation Facilities.**

<b>French Meadows Area</b>
Ahart Campground
Coyote Group Campground
Poppy Campground
French Meadows Campground
Gates Group Campground
Lewis Campground
French Meadows Picnic Area
McGuire Picnic Area
French Meadows Boat Ramp
McGuire Boat Ramp
Dolly Creek Water Supply
French Meadows Campground Water Supply
<b>Hell Hole Area</b>
Big Meadows Campground
Hell Hole Campground
Upper Hell Hole Campground
Hell Hole Vista
Hell Hole General Parking Area
Hell Hole Boat Ramp Parking Area
Hell Hole Boat Ramp
Big Meadows Campground Water Supply
<b>Ralston Afterbay Area</b>
Ralston Picnic Area
Ralston Picnic Area Cartop Boat Ramp
Indian Bar Rafting Access and General Parking
<b>Long Canyon Area</b>
Middle Meadows Group Campground
Middle Meadows Group Campground Water Supply



**Table TERR 2-3. Dispersed Concentrated Use Areas.**

<b>Dispersed Concentrated Use Areas</b>	
<b>French Meadows Reservoir Area</b>	
Area near French Meadows-Hell Hole Tunnel Gatehouse	
Area immediately downstream of French Meadows Dam (both sides of river)	
Area located immediately northwest of French Meadows Dam	
Area near bridge over the Middle Fork American River, upstream French Meadows Reservoir	
<b>Duncan Creek Diversion Dam Area</b>	
Area on north side of Duncan Creek Diversion Dam	
Area near Duncan Creek Gage and Weir, upstream of Duncan Creek Diversion Dam	
Area near new bridge crossing Duncan Canyon on the road to the Grizzly, etc.	
<b>Hell Hole Reservoir Area</b>	
Area on west side of Hell Hole Reservoir, between dam and Hell Hole Boat Ramp	
Grey Horse Area	
<b>Long Canyon Area</b>	
Area surrounding South Fork Long Canyon Diversion Dam	
Areas along South Fork Long Canyon Creek, downstream of South Fork Long Canyon Diversion Dam	
<b>Middle Fork Interbay Area</b>	
Shoreline area surrounding Middle Fork Interbay	
<b>Ralston Afterbay Area</b>	
Ralston Afterbay Sediment Disposal Area	
Shoreline area surrounding Ralston Afterbay	
Area along Middle Fork American River, between Ralston Picnic Area and the new gage	
Area at confluence of North Fork of the Middle Fork American River and Middle Fork American River	
Indian Bar, Willow Bar, and Junction Bar Areas	

**Table TERR 2-4. Potential Project Betterments.**

<b>Hell Hole Reservoir Seasonal Storage Increase</b>	
<b>Hell Hole Dam</b>	
<b>Modified Facilities</b>	
Hell Hole Dam Spillway Crest Gates	
Hell Hole Dam Parapet Walls	
<b>New Facilities</b>	
Hell Hole Dam Spillway Crest Gates Control Building	
Hell Hole Dam Spillway Crest Gates Control Building Powerline	
<b>Temporary Construction and Staging Areas</b>	
Hell Hole Dam Spillway Crest Gates Construction Road	
Hell Hole Dam Spillway Crest Gates Construction Work Area	
Hell Hole Dam Spillway Crest Gates and Control Building Construction Staging Area	
Hell Hole Dam Parapet Wall Construction Staging and Work Area	
Hell Hole Dam Spillway Crest Gates Control Building Construction Work Area	
Hell Hole Dam Spillway Crest Gates Control Building Powerline Construction Work Area	
Hell Hole Dam Spillway Crest Gates Control Building Powerline Construction Staging Area	
<b>Hell Hole-Middle Fork Tunnel Gatehouse</b>	
<b>Modified Facilities</b>	
Hell Hole - Middle Fork Tunnel Gatehouse Parapet Wall	
<b>Temporary Construction and Staging Areas</b>	
Hell Hole-Middle Fork Tunnel Gatehouse Parapet Wall Construction Staging and Work Area	
<b>French Meadows Powerhouse</b>	
<b>Modified Facilities</b>	
French Meadows Powerhouse Parapet Wall	
<b>Temporary Construction and Staging Areas</b>	
French Meadows Powerhouse Parapet Wall Construction Staging and Work Area	
<b>South Fork Long Canyon Diversion</b>	
<b>Modified Facilities</b>	
South Fork Long Canyon Diversion Dam Crest Gates	
<b>New Facilities</b>	
South Fork Long Canyon Diversion Dam Crest Gates Generator Building	
<b>Temporary Construction and Staging Areas</b>	
South Fork Long Canyon Diversion Dam Crest Gates and Generator Building Construction Staging and Work Area	
<b>French Meadows Powerhouse Capacity Upgrade</b>	
<b>French Meadows Reservoir</b>	
<b>Modified Facilities</b>	
French Meadows - Hell Hole Tunnel Intake Trash Rack	
<b>Temporary Construction and Staging Areas</b>	
French Meadows - Hell Hole Tunnel Intake Trash Rack Construction Staging Area	
French Meadows - Hell Hole Tunnel Intake Trash Rack Construction Work Area	
French Meadows - Hell Hole Tunnel Intake Trash Rack Construction Road	
<b>French Meadows Powerhouse</b>	
<b>Modified Facilities</b>	
French Meadows Powerhouse Switchyard	
<b>New Facilities</b>	
French Meadows Powerhouse	

**Table TERR 2-4. Potential Project Betterments (continued).**

<b>French Meadows Powerhouse Capacity Upgrade (continued)</b>	
<b>French Meadows Powerhouse (continued)</b>	
French Meadows Powerhouse Penstock	
French Meadows - Hell Hole Tunnel Surge Shaft/Tank	
French Meadows - Hell Hole Tunnel Surge Pipeline	
French Meadows - Hell Hole Tunnel Surge Shaft or Pipeline Road	
<b>Temporary Construction and Staging Areas</b>	
French Meadows Powerhouse/Switchyard Construction Work Area	
French Meadows Powerhouse/Switchyard Construction Staging Area	
French Meadows Powerhouse Penstock Construction Work Area	
French Meadows Powerhouse Penstock Construction Staging Areas	
French Meadows - Hell Hole Tunnel Surge Shaft/Tank or Pipeline Construction Staging Areas	
French Meadows - Hell Hole Tunnel Surge Shaft/Tank Construction Work Area	
French Meadows - Hell Hole Tunnel Surge Pipeline Construction Work Area	
French Meadows - Hell Hole Tunnel Surge Shaft or Pipeline Road Construction Staging and Work Area	
<b>Non-Project Facilities Modified During Construction</b>	
Forest Road 14N09A	
Forest Road 14N09A Construction Staging and Work Area	
<b>Middle Fork Powerhouse</b>	
<b>Modified Facilities</b>	
Middle Fork Powerhouse Upper and Lower Switchyard	
<b>Ralston Powerhouse Capacity Upgrade</b>	
<b>Ralston Powerhouse</b>	
<b>Modified Facilities</b>	
Ralston Powerhouse	
<b>Temporary Construction and Staging Areas</b>	
Ralston Powerhouse Construction Staging Area	

**Table TERR 2-5. Quantitative Geomorphology and Riparian Sampling Sites.**

2006 Geomorphology and Riparian Quantitative Study Site Names <sup>1,2</sup>	Reach Location (river mile)
<b>Middle Fork American River</b>	
MF-10	44.7
MF-9	36.2
MF-7	29.4
MF-6	28.6
MF-4	26.2
MF-3	16.95
MF-2	10.4
MF-1	4.8
<b>Rubicon River</b>	
R-16	28.1
R-15	25.7
R-13	20.9
R-12	19.5
R-10	14.3
R-5	3.8
R-4	3.5
R-3	2.6
R-2	1.2
R-1	0.7
<b>Duncan Creek</b>	
D-3	8.3
D-2	6.3
D-1	4.6
<b>Long Canyon Creek</b>	
LC-2	9
LC-1	0
SFLC-1	2.3
NFLC-1	1.9

<sup>1</sup>The sampling was done as part of early physical habitat characterization studies of the MFP rivers (PCWA 2007).

<sup>2</sup>Study Site numbers correspond to the 2006 Rosgen Study Reaches and may not be consecutive due to the inaccessibility of some reaches (PCWA 2007).

Table TERR 2-6. Location of Special-Status Plant Populations at Existing Project Facilities and Features, Project Recreation Facilities, and Dispersed Concentrated Use Areas.

Scientific Name	Common Name	Map ID <sup>1</sup>	Area		Number of Individuals	Associated Project Facilities or Features, Recreation Facilities, or Dispersed Concentrated Use Areas		
			Square Feet	Acres		Project Facility or Feature	Project Recreation Facility	Dispersed Concentrated Use Area
Ralston Area (Brushy Canyon)								
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	BC01	11,236	0.26	150	Brushy Canyon Adit Road	—	—
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	BC02	26,703	0.61	40	Brushy Canyon Adit Road	—	—
Subtotal		2 populations	37,939	0.87	190			
Duncan Creek Area								
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	DC01	—	—	4	Duncan Creek Diversion Pool	—	Area near Duncan Creek Gage and Weir, upstream of Duncan Creek Diversion Dam
Subtotal		1 population	—	—	4			
French Meadows Area								
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	FM01	—	—	1	<ul style="list-style-type: none"><li>Duncan Creek - Middle Fork Tunnel Portal</li><li>French Meadows Reservoir</li></ul>	—	—
Subtotal		1 population	—	—	1			
Hell Hole Area								
Populations Located in the Vicinity of Off-Reservoir Project Facilities, Features, and Recreation Facilities								
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH01	25	0.00	2	Hell Hole Dam Spillway Discharge Channel Road	—	—
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH02	250	0.00	5	Hell Hole Dam Spillway Discharge Channel Road	—	—
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH03	600	0.01	5	Hell Hole Dam Spillway Discharge Channel Road	—	—
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH04	4	0.00	5	Hell Hole Dam Spillway Discharge Channel Road	—	—
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH05	25	0.00	5	Hell Hole Dam Spillway Discharge Channel Road	—	—
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH06	50	0.00	5	Hell Hole Dam Spillway Discharge Channel Road	—	—
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH07	35,038	0.80	17,500 – 35,000	—	Hell Hole General Parking Area	—
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH09	126,886	2.91	63,500 – 127,000	—	Hell Hole Campground	—
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH14	93,831	2.15	47,000 – 94,000	—	Hell Hole Vista	—
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH17	3,902	0.09	2,000 – 4,000	French Meadows - Hell Hole Tunnel Portal Road	—	—
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH18	1,812	0.04	1,000 – 2,000	French Meadows - Hell Hole Tunnel Portal Road	—	—
Subtotal		11 populations	262,424	6.04	131,000 – 262,000			



Table TERR 2-6. Location of Special-Status Plant Populations at Existing Project Facilities and Features, Project Recreation Facilities, and Dispersed Concentrated Use Areas (continued).

Scientific Name	Common Name	Map ID <sup>1</sup>	Area		Number of Individuals	Associated Project Facilities or Features, Recreation Facilities, or Dispersed Concentrated Use Areas		
			Square Feet	Acres		Project Facility or Feature	Project Recreation Facility	Dispersed Concentrated Use Area
Hell Hole Area (continued)								
Populations Located in the Vicinity of Hell Hole Reservoir								
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH08	65,082	1.49	32,500 – 65,000	<ul style="list-style-type: none"><li>Hell Hole – Middle Fork Tunnel Gatehouse Road</li><li>Hell Hole Reservoir</li></ul>	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH10	304,335	6.99	152,000 – 304,000	<ul style="list-style-type: none"><li>French Meadows Powerhouse Road</li><li>Hell Hole Reservoir</li></ul>	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH15	49,849	1.14	25,000 – 50,000	<ul style="list-style-type: none"><li>French Meadows Powerhouse Road</li><li>Hell Hole Reservoir</li></ul>	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH19	21,313	0.49	10,500 – 21,000	<ul style="list-style-type: none"><li>French Meadows Powerhouse Road</li><li>Hell Hole Reservoir</li></ul>	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH21	14,375	0.33	7,000 – 14,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH22	62,334	1.43	31,000 – 62,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH23	23,824	0.55	12,000 – 24,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH24	244,131	5.60	122,000 – 244,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH25	19,457	0.45	9,500 – 19,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH26	71,357	1.64	35,500 – 71,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH27	93,382	2.14	46,500 – 93,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH28	167,013	3.83	83,500 – 167,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH29	423,790	9.73	212,000 – 424,000	Hell Hole Reservoir	–	Gray Horse Area
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH30	358,404	8.23	179,000 – 358,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH31	246,920	5.67	123,500 – 247,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH32	82,348	1.89	41,000 – 82,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH33	50,889	1.17	25,500 – 51,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH34	399,123	9.16	199,500 – 399,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH35	439,293	10.08	219,500 – 439,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH36	11,224	0.26	5,500 – 11,000	Hell Hole Reservoir	Upper Hell Hole Campground	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH37	1,413	0.03	500 – 1,000	Hell Hole Reservoir	Upper Hell Hole Campground	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH38	160,315	3.68	80,000 – 160,000	Hell Hole Reservoir	Upper Hell Hole Campground	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH39	17,919	0.41	9,000 – 18,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH40	27,979	0.64	14,000 – 28,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH41	891,483	20.47	445,500 – 891,000	Hell Hole Reservoir	–	–

Table TERR 2-6. Location of Special-Status Plant Populations at Existing Project Facilities and Features, Project Recreation Facilities, and Dispersed Concentrated Use Areas (continued).

Scientific Name	Common Name	Map ID <sup>1</sup>	Area		Number of Individuals	Associated Project Facilities or Features, Recreation Facilities, or Dispersed Concentrated Use Areas		
			Square Feet	Acres		Project Facility or Feature	Project Recreation Facility	Dispersed Concentrated Use Area
Hell Hole Area (continued)								
Populations Located in the Vicinity of Hell Hole Reservoir (continued)								
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH42	36,557	0.84	18,500 – 37,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH43	17,561	0.40	9,000 – 18,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH44	89,308	2.05	44,500 – 89,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH45	48,850	1.12	24,500 – 49,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH46	36,949	0.85	18,500 – 37,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH47	95,286	2.19	47,500 – 95,000	Hell Hole Reservoir	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH51	7,348	0.17	3,500 – 7,000	<ul style="list-style-type: none"><li>Hell Hole Dam and Outlet Works</li><li>Hell Hole Reservoir</li></ul>	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH52	11,585	0.27	6,000 – 12,000	<ul style="list-style-type: none"><li>Hell Hole Dam and Outlet Works</li><li>Hell Hole Reservoir</li></ul>	–	–
Subtotal:		33 populations	4,591,000	105.39	2,295,500 – 4,591,000			
Grand Total:		48 populations	4,891,364	112.30	2,445,500 – 4,891,000			
Populations Located Outside Project Boundaries								
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH48	36,085	0.83	18,000 – 36,000	–	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH49	16,235	0.37	8,000 – 16,000	–	–	–
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH50	60,985	1.40	30,500 – 61,000	–	–	–

<sup>1</sup>Refer to Map TERR 2-2a through 2-2e.  
<sup>2</sup>If the population extended beyond the survey area, the entire extent of the population was included.  
<sup>3</sup>*Phacelia stebbinsii* density for polygons HH7 through HH52 was estimated to be between 0.5 and 1 individuals per square foot. Numbers are rounded to the nearest thousand.

**Table TERR 2-7. Location of Special-Status Plant Populations in the Study Area around Hell Hole Reservoir for the Existing Project.**

<b>Area 1</b>					
Below the current maximum normal operating WSE (4,630 feet msl).					
Species		Population Number <sup>1</sup>	Area <sup>2</sup>		Number of individuals <sup>3</sup>
Scientific Name	Common Name		Square Feet	Acres	
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH39	17,910	0.41	9,000 – 18,000
<b>Total:</b>			<b>17,910</b>	<b>0.41</b>	<b>9,000 – 18,000</b>

<b>Area 2</b>					
From the current maximum normal operating WSE (4,630 feet msl) to the maximum flood pool elevation (4,640 feet msl).					
Species		Population Number <sup>1</sup>	Area <sup>2</sup>		Number of Individuals <sup>3</sup>
Scientific Name	Common Name		Square Feet	Acres	
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH08	4,926	0.11	2,500 – 5,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH10	11,956	0.27	6,000 – 12,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH15	5,271	0.12	2,500 – 5,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH19	4,944	0.11	2,500 – 5,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH21	4,645	0.11	2,500 – 5,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH22	8,185	0.19	4,000 – 8,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH23	4,368	0.10	2,000 – 4,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH24	36,123	0.83	18,000 – 36,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH25	19,447	0.45	9,500 – 19,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH26	11,747	0.27	6,000 – 12,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH27	6,210	0.14	3,000 – 6,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH28	6,367	0.15	3,000 – 6,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH29	1,151	0.03	500 – 1,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH30	15,627	0.36	8,000 – 16,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH31	9,992	0.23	5,000 – 10,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH32	12,513	0.29	6,500 – 13,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH33	3,365	0.08	1,500 – 3,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH34	3,416	0.08	1,500 – 3,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH35	4,478	0.10	2,000 – 4,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH36	7,765	0.18	4,000 – 8,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH37	1,408	0.03	500 – 1,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH38	3,878	0.09	2,000 – 4,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH39	9	0.00	4 – 9
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH40	1,988	0.05	1,000 – 2,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH41	14,821	0.34	7,500 – 15,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH42	23,089	0.53	11,500 – 23,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH43	11,091	0.25	5,500 – 11,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH45	20,123	0.46	10,000 – 20,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH46	24,792	0.57	12,500 – 25,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH47	22,321	0.51	11,000 – 22,000
<b>Total:</b>			<b>306,018</b>	<b>7.03</b>	<b>153,000 – 306,000</b>



**Table TERR 2-7. Location of Special-Status Plant Populations in the Study Area around Hell Hole Reservoir for the Existing Project (continued).**

<b>Area 3</b> From the maximum flood pool elevation (4,640 feet msl) to the upper limit of the study area					
Species		Population Number <sup>1</sup>	Area <sup>2</sup>		Number of Individuals <sup>3</sup>
Scientific Name	Common Name		Square Feet	Acres	
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH08	60,155	1.38	30,000 – 60,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH10	157,092	3.61	78,500 – 157,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH15	36,009	0.83	18,000 – 36,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH19	16,370	0.38	8,000 – 16,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH21	9,693	0.22	5,000 – 10,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH22	53,958	1.24	27,000 – 54,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH23	19,372	0.44	9,500 – 19,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH24	133,628	3.07	67,000 – 134,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH25	9	0.00	5 – 9
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH26	58,783	1.35	29,500 – 59,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH27	86,712	1.99	43,500 – 87,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH28	81,216	1.86	40,500 – 81,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH29	104,403	2.40	52,000 – 104,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH30	157,382	3.61	78,500 – 157,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH31	184,850	4.24	92,500 – 185,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH32	64,727	1.49	32,500 – 65,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH33	45,630	1.05	23,000 – 46,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH34	206,916	4.75	103,500 – 207,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH35	135,118	3.10	67,500 – 135,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH36	3,388	0.08	1,500 – 3,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH38	37,041	0.85	18,500 – 37,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH40	25,917	0.59	13,000 – 26,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH41	169,159	3.88	84,500 – 169,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH42	13,468	0.31	6,500 – 13,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH43	6,470	0.15	3,000 – 6,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH44	7,269	0.17	3,500 – 7,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH45	25,295	0.58	12,500 – 25,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH46	12,157	0.28	6,000 – 12,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH47	67,556	1.55	34,000 – 68,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH51	5,672	0.13	2,800 – 5,600
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH52	8,848	0.20	4,500 – 9,000
<b>Total:</b>			<b>1,994,262</b>	<b>45.78</b>	<b>997,000 – 1,994,000</b>

**Table TERR 2-7. Location of Special-Status Plant Populations in the Study Area around Hell Hole Reservoir for the Existing Project (continued).**

<b>Area 4</b> Includes portions of those populations intersecting Areas 1, 2, and /or 3 that extend beyond Area 3.					
Species		Population Number <sup>1</sup>	Area <sup>2</sup>		Number of Individuals <sup>3</sup>
Scientific Name	Common Name		Square Feet	Acres	
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH10	135,286	3.1	67,500 – 135,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH15	8,569	0.2	4,500 – 9,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH21	37	0.00	18 – 37
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH22	191	0.00	95 – 191
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH24	74,379	1.71	37,000 – 74,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH23	84	0.00	42 – 84
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH26	826	0.02	413 – 826
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH27	460	0.01	230 – 460
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH28	79,429	1.82	40,000 – 80,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH29	318,235	7.31	159,000 – 318,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH41	707,499	16.24	354,000 – 707,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH40	74	0.00	37 – 74
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH30	185,394	4.26	92,500 – 185,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH31	52,078	1.20	26,000 – 52,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH32	5,108	0.12	2,500 – 5,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH33	1,895	0.04	1,000 – 2,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH35	299,696	6.88	150,000 – 300,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH34	188,789	4.33	94,000 – 188,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH38	119,396	2.74	59,500 – 119,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH44	82,039	1.88	41,000 – 82,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH45	3,432	0.08	1,500 – 3,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH47	5,409	0.12	2,500 – 5,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH51	1,676	0.04	1,000 – 2,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH52	2,737	0.06	1,500 – 3,000
<b>Total:</b>			<b>2,272,717</b>	<b>52.17</b>	<b>1,136,500 – 2,273,000</b>

<sup>1</sup>Refer to Map TERR 2-2a through 2-2e for the location of each population within the study area. Only those populations associated with Project facilities and features are included.

<sup>2</sup>Includes only the portion of the population that falls between the specified elevations.

<sup>3</sup>Numbers of individuals for polygons HH7 through HH52 was estimating assuming a density of 0.5 to 1.0 individuals per square foot. Numbers are rounded to the nearest thousand.

Table TERR 2-8. Location of Special-Status Plant Populations at Potential Project Betterments.

Proposed Betterments	Scientific Name	Common Name	Polygon Identification Number <sup>2</sup>	Area <sup>3</sup>		Number of Individuals (estimated) <sup>4</sup>
				Square Feet	Acres	
Hell Hole Reservoir Seasonal Storage Increase <sup>1</sup>						
Hell Hole Dam						
Modified Facilities						
Hell Hole Dam Spillway Crest Gates	—	—	—	—	—	—
Hell Hole Dam Parapet Walls	<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH51	7,348	0.17	4,000–7,000
	<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH52	11,585	0.27	6,000–12,000
New Facilities						
Hell Hole Dam Spillway Crest Gates Control Building	—	—	—	—	—	—
Hell Hole Dam Spillway Crest Gates Control Building Powerline	—	—	—	—	—	—
Temporary Construction and Staging Areas						
Hell Hole Dam Spillway Crest Gates Construction Road	—	—	—	—	—	—
Hell Hole Dam Spillway Crest Gates Construction Work Area	—	—	—	—	—	—
Hell Hole Dam Spillway Crest Gates and Control Building Construction Staging Area	—	—	—	—	—	—
Hell Hole Dam Parapet Wall Construction Staging and Work Area	<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH51	7,348	0.17	4,000–7,000
	<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH52	11,585	0.27	6,000–12,000
Hell Hole Dam Spillway Crest Gates Control Building Powerline Construction Staging Area	—	—	—	—	—	—
Hell Hole-Middle Fork Tunnel Gatehouse						
Modified Facilities						
Hell Hole – Middle Fork Tunnel Gatehouse Parapet Wall	<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH08	65,082	1.5	33,000–65,000
Temporary Construction and Staging Areas						
Hell Hole-Middle Fork Tunnel Gatehouse Parapet Wall Construction Staging and Work Area	<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH08	65,082	1.5	33,000–65,000
French Meadows Powerhouse						
Modified Facilities						
French Meadows Powerhouse Parapet Wall	—	—	—	—	—	—

**Table TERR 2-8. Location of Special-Status Plant Populations at Potential Project Betterments (continued).**

Proposed Betterments	Scientific Name	Common Name	Polygon Identification Number <sup>2</sup>	Area (sq. ft.) <sup>3</sup>	Area (acres)	Number of Individuals (estimated) <sup>4</sup>
<b>French Meadows Powerhouse (continued)</b>						
<b>Temporary Construction and Staging Areas</b>						
French Meadows Powerhouse Parapet Wall Construction Staging and Work Area	—	—	—	—	—	—
<b>South Fork Long Canyon Diversion</b>						
<b>Modified Facilities</b>						
South Fork Long Canyon Diversion Dam Crest Gates	—	—	—	—	—	—
<b>New Facilities</b>						
South Fork Long Canyon Diversion Dam Crest Gates Generator Building	—	—	—	—	—	—
<b>Temporary Construction and Staging Areas</b>						
South Fork Long Canyon Diversion Dam Crest Gates and Generator Building Construction Staging and Work Area	—	—	—	—	—	—

Proposed Betterments	Scientific Name	Common Name	Polygon Identification Number <sup>2</sup>	Area (sq. ft.) <sup>3</sup>	Area (acres)	Number of Individuals (estimated) <sup>4</sup>
<b>French Meadows Powerhouse Capacity Upgrade</b>						
<b>French Meadows Reservoir</b>						
<b>Modified Facilities</b>						
French Meadows – Hell Hole Tunnel Intake Trash Rack	—	—	—	—	—	—
<b>Temporary Construction and Staging Areas</b>						
French Meadows – Hell Hole Tunnel Intake Trash Rack Construction Staging Area	—	—	—	—	—	—
French Meadows – Hell Hole Tunnel Intake Trash Rack Construction Work Area	—	—	—	—	—	—
French Meadows – Hell Hole Tunnel Intake Trash Rack Construction Road	—	—	—	—	—	—

**Table TERR 2-8. Location of Special-Status Plant Populations at Potential Project Betterments (continued).**

Proposed Betterments	Scientific Name	Common Name	Polygon Identification Number <sup>2</sup>	Area (sq. ft.) <sup>3</sup>	Area (acres)	Number of Individuals (estimated) <sup>4</sup>
<b>French Meadows Powerhouse</b>						
<b>Modified Facilities</b>						
French Meadows Powerhouse Switchyard	—	—	—	—	—	—
<b>New Facilities</b>						
French Meadows Powerhouse	—	—	—	—	—	—
French Meadows Powerhouse Penstock	—	—	—	—	—	—
French Meadows – Hell Hole Tunnel Surge Shaft/Tank	—	—	—	—	—	—
French Meadows – Hell Hole Tunnel Surge Pipeline	—	—	—	—	—	—
French Meadows – Hell Hole Tunnel Surge Shaft or Pipeline Road	—	—	—	—	—	—
<b>Temporary Construction and Staging Areas</b>						
French Meadows Powerhouse/Switchyard Construction Work Area	—	—	—	—	—	—
French Meadows Powerhouse/Switchyard Construction Staging Area	—	—	—	—	—	—
French Meadows Powerhouse Penstock Construction Work Area	—	—	—	—	—	—
French Meadows Powerhouse Penstock Construction Staging Areas	—	—	—	—	—	—
French Meadows – Hell Hole Tunnel Surge Shaft/Tank or Pipeline Construction Staging Areas	—	—	—	—	—	—
French Meadows – Hell Hole Tunnel Surge Shaft/Tank Construction Work Area	<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH20	20,791	0.48	10,000–20,000
French Meadows – Hell Hole Tunnel Surge Pipeline Construction Work Area	<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH20	20,791	0.48	10,000–20,000
French Meadows – Hell Hole Tunnel Surge Shaft or Pipeline Road Construction Staging and Work Area	—	—	—	—	—	—

**Table TERR 2-8. Location of Special-Status Plant Populations at Potential Project Betterments (continued).**

Proposed Betterments	Scientific Name	Common Name	Polygon Identification Number <sup>2</sup>	Area (sq. ft.) <sup>3</sup>	Area (acres)	Number of Individuals (estimated) <sup>4</sup>
<b>Non-Project Facilities Modified During Construction</b>						
Forest Road 14N09A	<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH11	19,859	0.46	10,000–20,000
	<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH12	23,045	0.53	12,000–23,000
	<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH13	26,649	0.61	13,000–27,000
Forest Road 14N09A	<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH16	265,900	6.1	133,000–266,000
	<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH20	20,791	0.48	10,000–20,000
Forest Road 14N09A Construction Staging and Work Area	<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH20	20,791	0.48	10,000–20,000
<b>Middle Fork Powerhouse</b>						
<b>Modified Facilities</b>						
Middle Fork Powerhouse Upper and Lower Switchyard	—	—	—	—	—	—

Proposed Betterments	Scientific Name	Common Name	Polygon Identification Number <sup>2</sup>	Area (sq. ft.) <sup>3</sup>	Area (acres)	Number of Individuals (estimated) <sup>4</sup>
<b>Ralston Powerhouse Capacity Upgrade</b>						
<b>Ralston Powerhouse</b>						
<b>Modified Facilities</b>						
Ralston Powerhouse	—	—	—	—	—	—
<b>Temporary Construction and Staging Areas</b>						
Ralston Powerhouse Construction Staging Area	—	—	—	—	—	—

<sup>1</sup>This list includes only facilities associated with the Hell Hole Seasonal Storage Increase Betterment. It does not include the potential inundation areas along the shoreline of Hell Hole Reservoir.

<sup>2</sup>Refer to Map TERR 2-2a through 2-2e for the location of each population within the study area. Only those populations associated with project facilities and features are included.

<sup>3</sup>If the population extended beyond the survey area, the entire extent of the population is included.

<sup>4</sup>Number of individuals for polygons HH7 through HH52 was estimated assuming a density of 0.5 to 1.0 individuals per square foot. Numbers are rounded to the nearest thousand.



**Table TERR 2-9. Location of Special-Status Plant Populations in the Study Area for Hell Hole Reservoir Associated with the Hell Hole Reservoir Seasonal Storage Increase Betterment.**

<b>Area 2a</b>					
From the current maximum normal operating WSE (4,630 feet msl) to the potential new maximum normal operating WSE (4,636 feet msl) with installation of 6' gate					
Species		Population Number <sup>1</sup>	Area <sup>2</sup>		Number of Individuals <sup>3</sup>
Scientific Name	Common Name		Square Feet	Acres	
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH08	17	0.00	8 – 17
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH10	3,404	0.08	1,500 – 3,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH15	393	0.01	200 – 400
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH19	737	0.02	350 – 700
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH21	922	0.02	450 – 900
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH22	1,921	0.04	1,000 – 2,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH23	356	0.01	200 – 400
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH24	9,139	0.21	4,500 – 9,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH25	9,476	0.22	4,500 – 9,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH26	1,780	0.04	1,000 – 2,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH27	208	0.00	100 – 200
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH28	2,630	0.06	1,500 – 3,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH29	70	0.00	35 – 70
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH30	3,117	0.07	1,500 – 3,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH31	3,257	0.07	1,500 – 3,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH32	3,708	0.09	2,000 – 4,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH33	441	0.01	200 – 400
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH34	150	0.00	100 – 200
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH35	788	0.02	400 – 800
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH36	4,822	0.11	2,500 – 5,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH37	1,129	0.03	500 – 1,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH38	2,049	0.05	1,000 – 2,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH39	9	0.00	4 – 9
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH40	412	0.01	200 – 400
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH41	3,574	0.08	2,000 – 4,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH42	13,417	0.31	6,500 – 13,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH43	5,275	0.12	2,500 – 5,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH45	10,251	0.24	5,000 – 10,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH46	14,225	0.33	7,000 – 14,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH47	10,049	0.23	5,000 – 10,000
<b>Total:</b>			<b>107,727</b>	<b>2.47</b>	<b>54,000 – 108,000</b>



**Table TERR 2-9. Location of Special-Status Plant Populations in the Study Area for Hell Hole Reservoir Associated with the Hell Hole Reservoir Seasonal Storage Increase Betterment (continued).**

Area 2b					
From the new potential maximum normal operating WSE (4,636 feet msl) with installation of a 6' gate to the new potential maximum normal operating WSE (4,640 feet msl) with installation of 10' gate					
Species		Population Number <sup>1</sup>	Area <sup>2</sup>		Number of Individuals <sup>3</sup>
Scientific Name	Common Name		Square Feet	Acres	
<i>Phacelia stebbinsii</i>	Stebbins' phacelia -	HH08	4,909	0.11	2,500 – 5,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH10	8,552	0.20	4,500 – 9,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH15	4,878	0.11	2,500 – 5,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH19	4,206	0.10	2,000 – 4,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH21	3,723	0.09	2,000 – 4,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH22	6,264	0.14	3,000 – 6,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH23	4,012	0.09	2,000 – 4,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH24	26,984	0.62	13,500 – 27,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH25	9,972	0.23	5,000 – 10,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH26	9,967	0.23	5,000 – 10,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH27	6,002	0.14	3,000 – 6,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH28	3,737	0.09	2,000 – 4,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH29	1,081	0.02	500 – 1,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH30	12,509	0.29	6,500 – 13,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH31	6,734	0.15	3,500 – 7,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH32	8,806	0.20	4,500 – 9,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH33	2,924	0.07	1,500 – 3,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH34	3,265	0.07	1,500 – 3,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH35	3,690	0.08	18,500 – 37,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH36	2,943	0.07	1,500 – 3,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH37	279	0.01	150 – 300
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH38	1,829	0.04	1,000 – 2,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH40	1,576	0.04	1,000 – 2,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH41	11,247	0.26	5,500 – 11,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH42	9,671	0.22	5,000 – 10,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH43	5,816	0.13	3,000 – 6,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH45	9,872	0.23	5,000 – 10,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH46	10,567	0.24	5,500 – 11,000
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	HH47	12,272	0.28	6,000 – 12,000
<b>Total:</b>			<b>198,290</b>	<b>4.55</b>	<b>99,000 – 198,000</b>

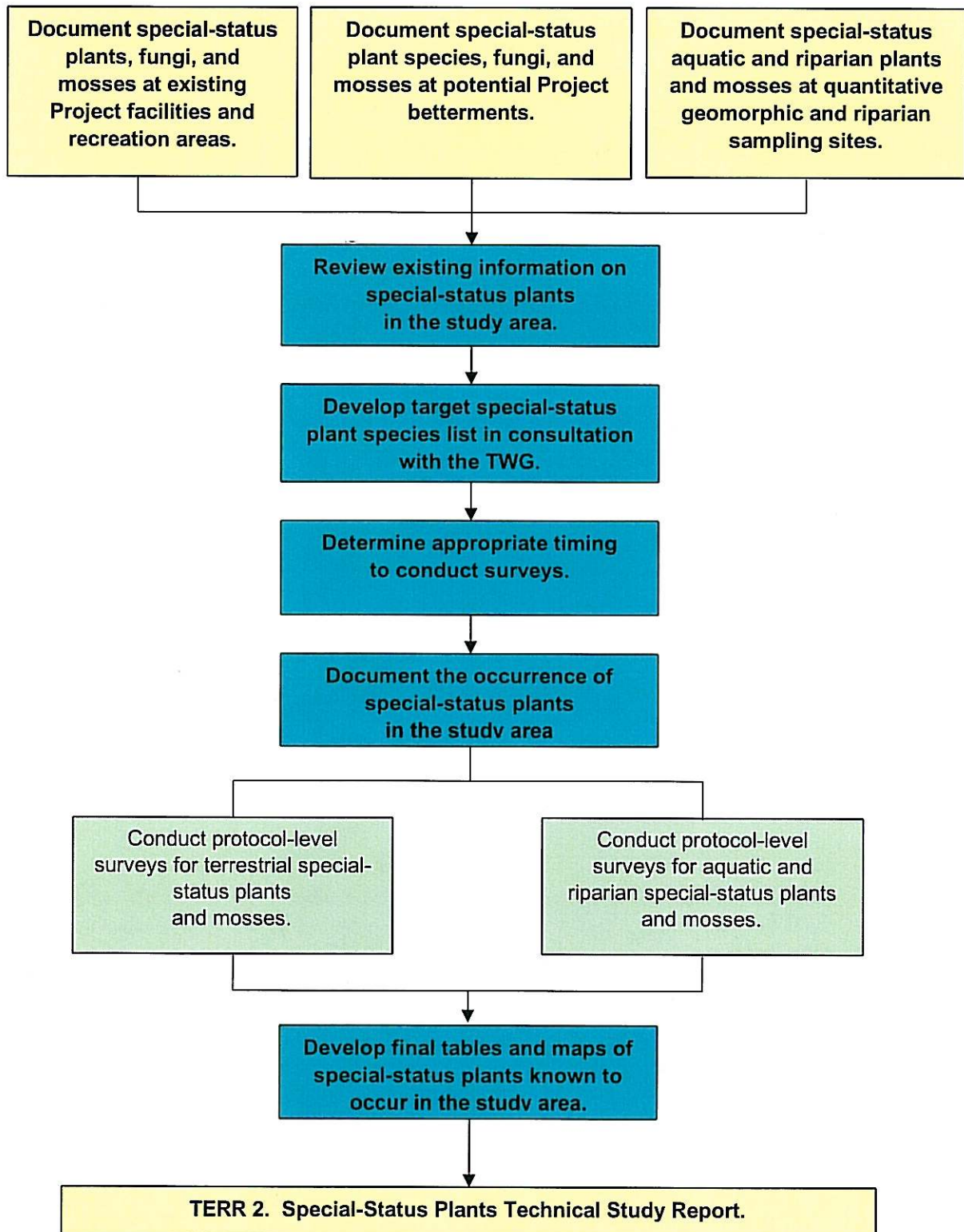
<sup>1</sup>Refer to Map TERR 2-3a through 2-3d for the location of each population within the study area. Only those populations associated with Project facilities and features are included.

<sup>2</sup>Includes only the portion of the population that falls between the specified elevations.

<sup>3</sup>Numbers of individuals for polygons HH7 through HH52 was estimated assuming a density of 0.5 to 1.0 individuals per square foot. Numbers are rounded to the nearest thousand.

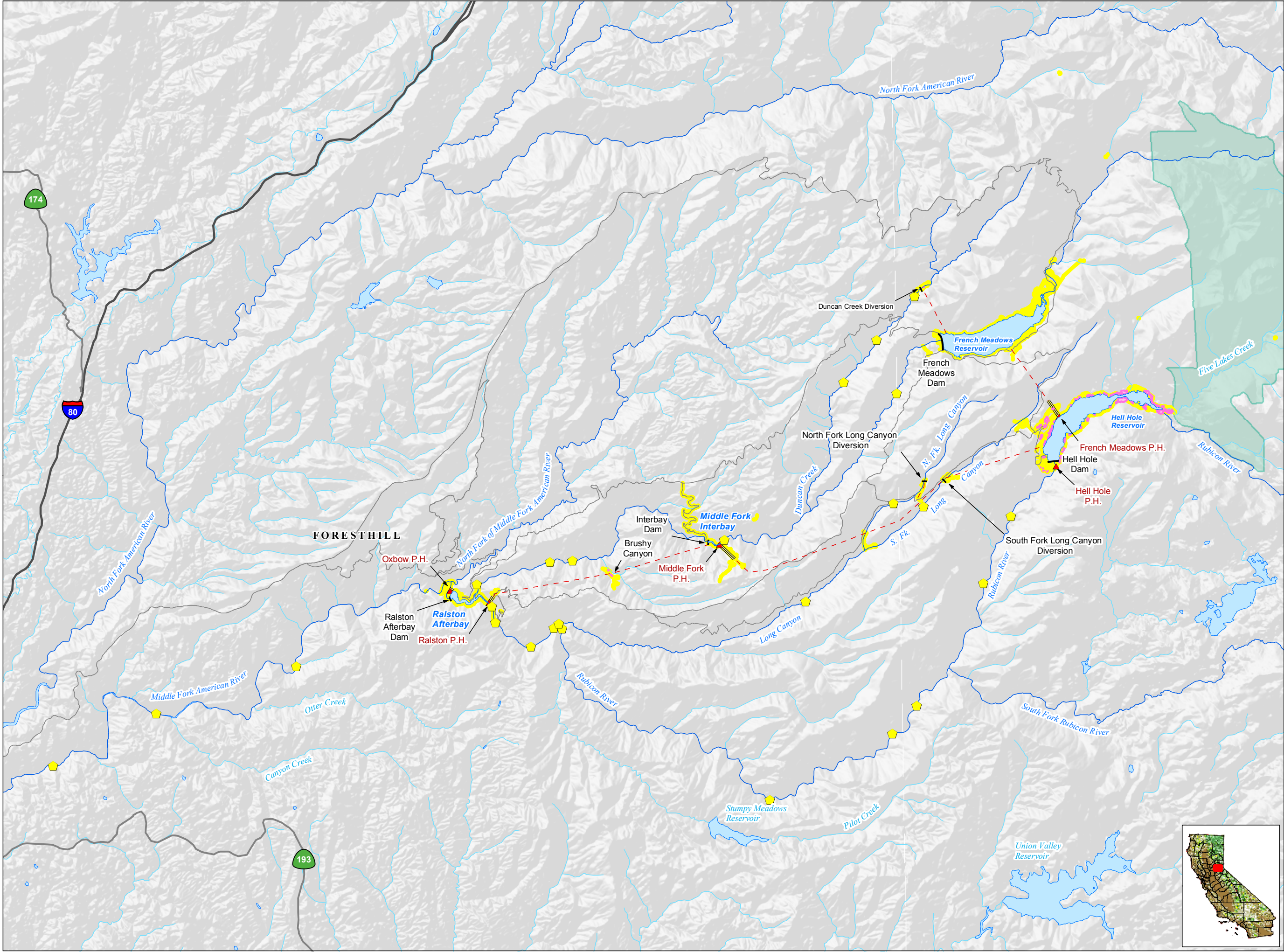
## FIGURES

**Figure TERR 2-1. Study Objectives and Related Study Elements and Reports.**



## **MAPS**





**Project Facilities**

- ▲ Powerhouse
- Dam
- - - Tunnel
- === Penstock

**Transportation**

- Major Road
- Minor Road

**Hydrography**

- Watercourse
- Water Body

**Designated Boundary**

- Wilderness Area

**TERR 2 Survey Data**

- Quantitative Geomorphic and Riparian Sampling Site
- TERR 2 Study Area
- Stebbins' phacelia populations

**PCWA**  
Placer County Water Agency  
Middle Fork American River Project

**Map TERR 2-1**  
Location of Quantitative Geomorphic and Riparian Sampling Sites

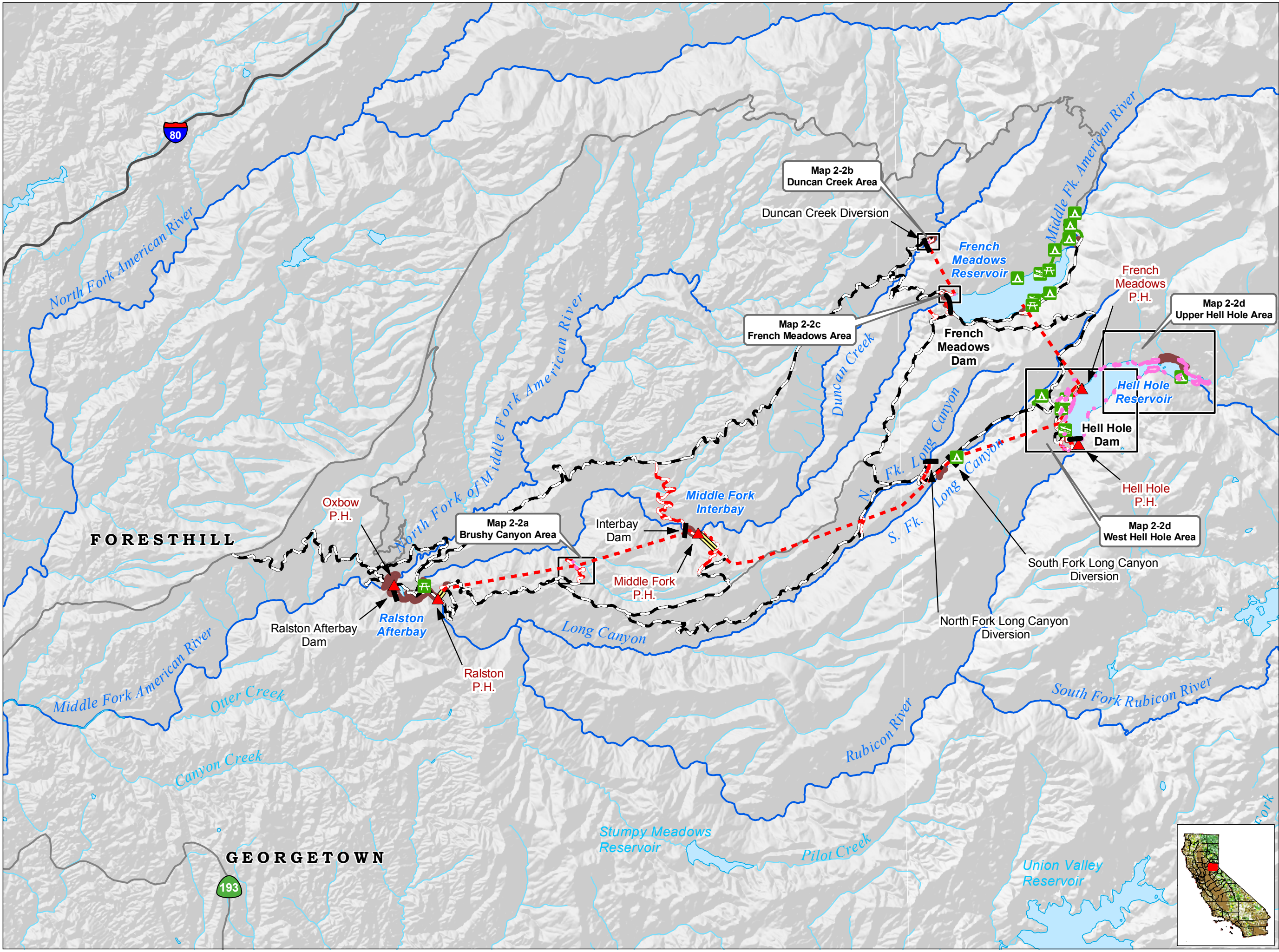
**Projection: CA State Plane, Zone 2**  
**Datum: NAD 83**

Date: 2/3/09

0 0.5 1 2 3 Miles

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**Project Facilities**

- ▲ Powerhouse
- Dam
- - - Tunnel
- == Penstock

**Project Recreation Facilities**

- 🚤 Boat Ramp
- 🏕️ Developed Campground
- 🍷 Picnic Area
- 📷 Scenic Viewpoint
- Dispersed Concentrated Use Area

**Transportation**

- Project Road
- - - Non-Project General Access Road
- Major Road
- Minor Road

**Hydrography**

- Watercourse
- Water Body

**Special-status Plants**

- Stebbins' phacelia population



Placer County Water Agency  
Middle Fork American River Project

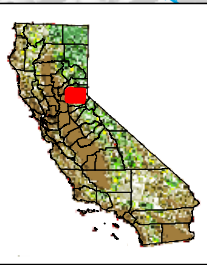
**Map TERR 2-2**  
Location of Special-Status Plant Populations  
in Relation to Existing Project Facilities  
and Features, Project Recreation Facilities,  
and Dispersed Concentrated Use Areas  
Overview Map



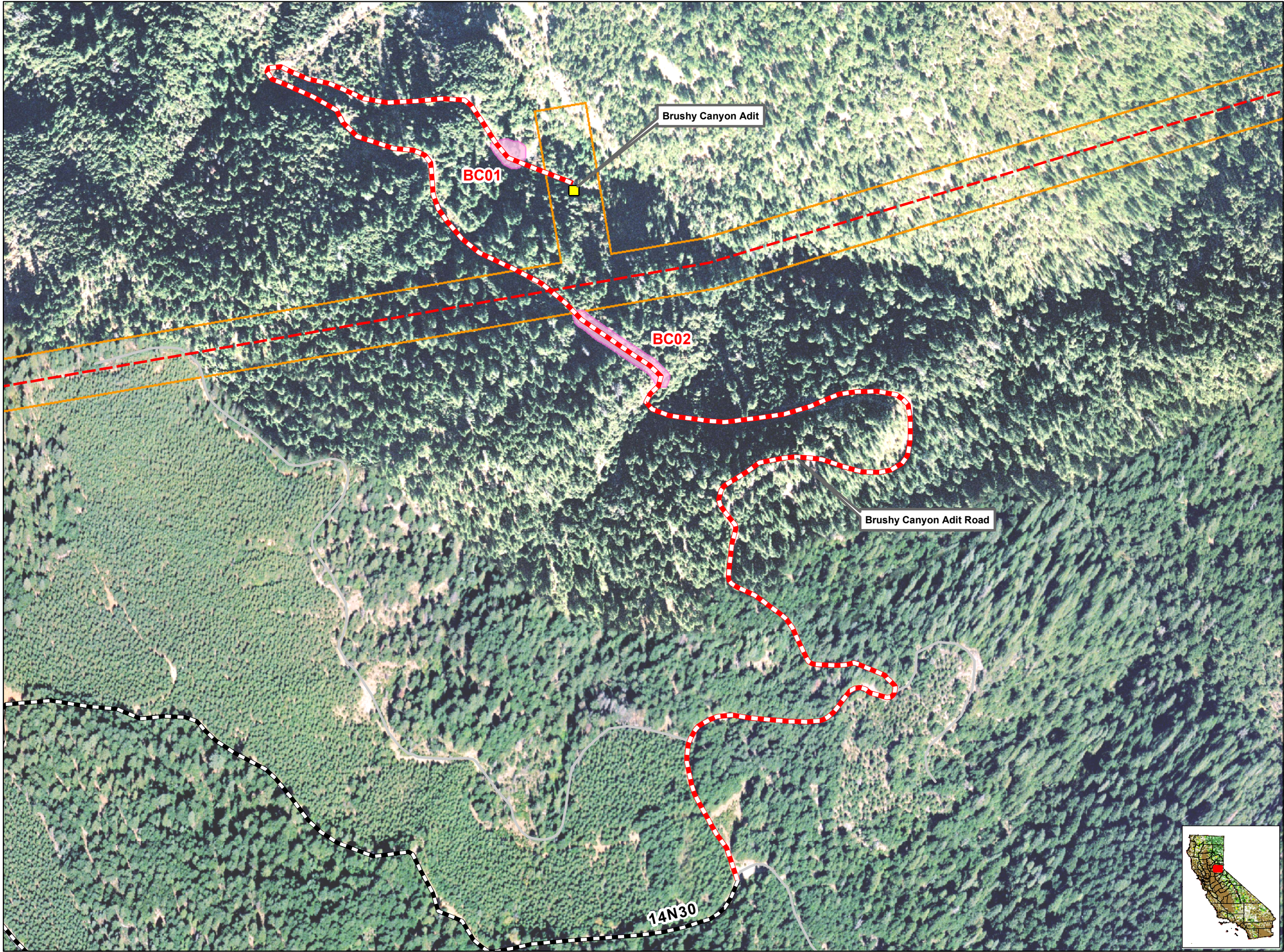
0 1 2 3  
Miles

Projection: CA State Plane, Zone 2  
Datum: NAD 83

Date: 2/3/09







**PCWA Facilities and Features**

- Dam
- Ancillary and Other Facilities
- Powerhouse
- Gage
- Penstock
- Tunnel
- Pipeline
- Access Point
- FERC Boundary

**Project Power and Communication Lines:**

- Communication
- Power
- Power (underground)
- Communication/Power
- Communication/Power (underground)

**Transportation**

- Non-Project General Access Road
- Project Road
- Project Trail
- Recreation Access Road
- Recreation Water Supply Facility Access Road or Trail
- Other Road

**Project Recreation Facilities**

- Picnic Area
- Boat Ramp
- Scenic Viewpoint
- Developed Campground
- Water Supply Line
- Dispersed Concentrated Use Area

**Other Facilities**

PG & E Transmission Lines:

- 230 kV
- 60 kV

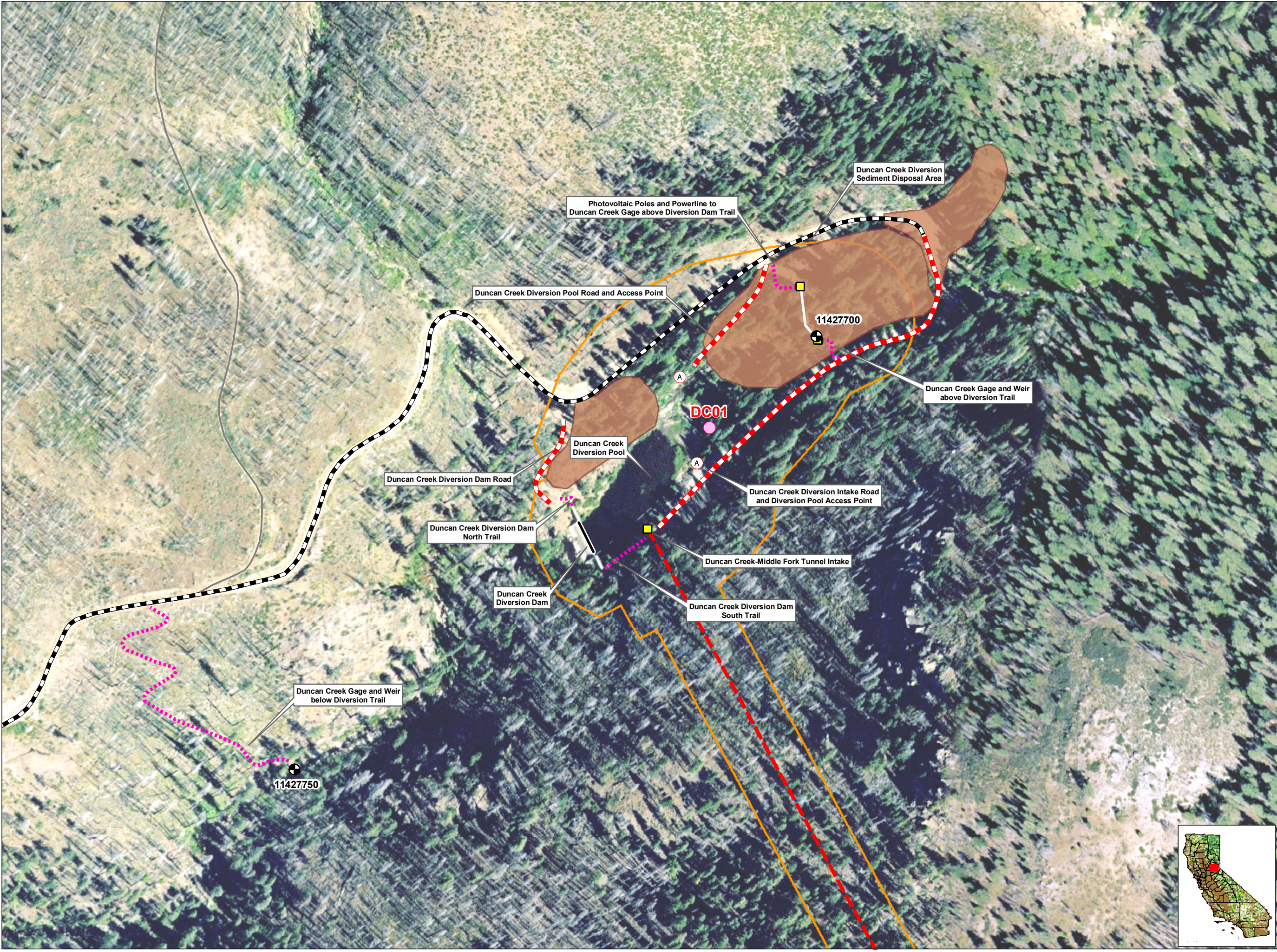
**Special-status Plants**

- Stebbins' phacelia population

Placer County Water Agency  
Middle Fork American River Project  
**Map TERR 2-2a**  
**Location of Special-Status Plant Populations in Relation to Existing Project Facilities and Features, Project Recreation Facilities, and Dispersed Concentrated Use Areas**  
**Brushy Canyon Area**

0 100 200 Feet  
Projection: Ca. Stateplane, Zone 2  
Datum: NAD 83  
Date: 2/3/09





**PCWA Facilities and Features**

- Dam
- Ancillary and Other Facilities
- Powerhouse
- Gage
- Penstock
- Tunnel
- Pipeline
- Access Point
- FERC Boundary

**Project Power and Communication Lines:**

- Communication
- Power
- Power (underground)
- Communication/Power
- Communication/Power (underground)

**Transportation**

- Non-Project General Access Road
- Project Road
- Project Trail
- Recreation Access Road
- Recreation Water Supply Facility Access Road or Trail
- Other Road

**Project Recreation Facilities**

- Picnic Area
- Boat Ramp
- Scenic Viewpoint
- Developed Campground
- Water Supply Line
- Dispersed Concentrated Use Area

**Other Facilities**

PG & E Transmission Lines:

- 230 kV
- 60 kV

**Special-status Plants**

- Stebbins' phacelia population

Placer County Water Agency  
Middle Fork American River Project  
**Map TERR 2-2b**  
**Location of Special-Status Plant Populations in Relation to Existing Project Facilities and Features, Project Recreation Facilities, and Dispersed Concentrated Use Areas**  
**Duncan Creek Area**

0 125 250 Feet

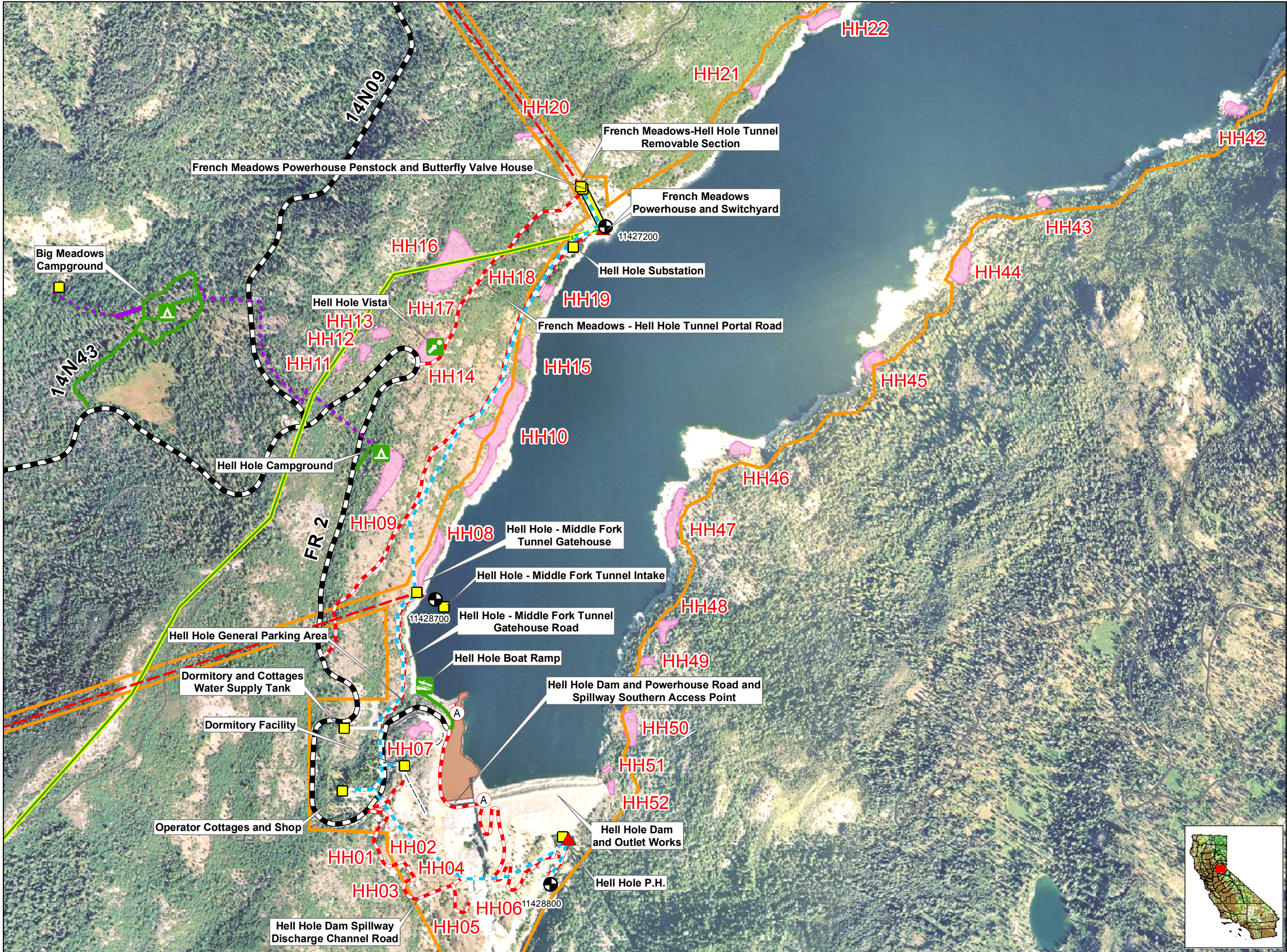
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Date: 2/3/09









**PCWA Facilities and Features**

- Dam
- Ancillary and Other Facilities
- Powerhouse
- Gage
- Penstock
- Tunnel
- Pipeline
- Access Point
- FERC Boundary

**Project Power and Communication Lines:**

- Communication
- Power
- Power (underground)
- Communication/Power
- Communication/Power (underground)

**Transportation**

- Non-Project General Access Road
- Project Road
- Project Trail
- Recreation Access Road
- Recreation Water Supply Facility Access Road or Trail
- Other Road

**Project Recreation Facilities**

- Picnic Area
- Boat Ramp
- Scenic Viewpoint
- Developed Campground
- Water Supply Line
- Dispersed Concentrated Use Area

**Other Facilities**

PG & E Transmission Lines:

- 230 kV
- 60 kV

**Special-status Plants**

- Stebbins' phacelia population

Placer County Water Agency  
Middle Fork American River Project  
Map TERR 2-2d

**Location of Special-Status Plant Populations in Relation to Existing Project Facilities and Features, Project Recreation Facilities, and Dispersed Concentrated Use Areas**  
Lower Hell Hole Area

0 500 1,000 Feet  
Projection: Ca. Stateplane, Zone 2  
Datum: NAD 83  
Date: 2/3/09





**PCWA Facilities and Features**

- Dam
- Ancillary and Other Facilities
- Powerhouse
- Gage
- Penstock
- Tunnel
- Pipeline
- Access Point
- FERC Boundary

**Project Power and Communication Lines:**

- Communication
- Power
- Power (underground)
- Communication/Power
- Communication/Power (underground)

**Transportation**

- Non-Project General Access Road
- Project Road
- Project Trail
- Recreation Access Road
- Recreation Water Supply Facility Access Road or Trail
- Other Road

**Project Recreation Facilities**

- Picnic Area
- Boat Ramp
- Scenic Viewpoint
- Developed Campground
- Water Supply Line
- Dispersed Concentrated Use Area

**Other Facilities**

PG & E Transmission Lines:

- 230 kV
- 60 kV

**Special-status Plants**

- Stebbins' phacelia population

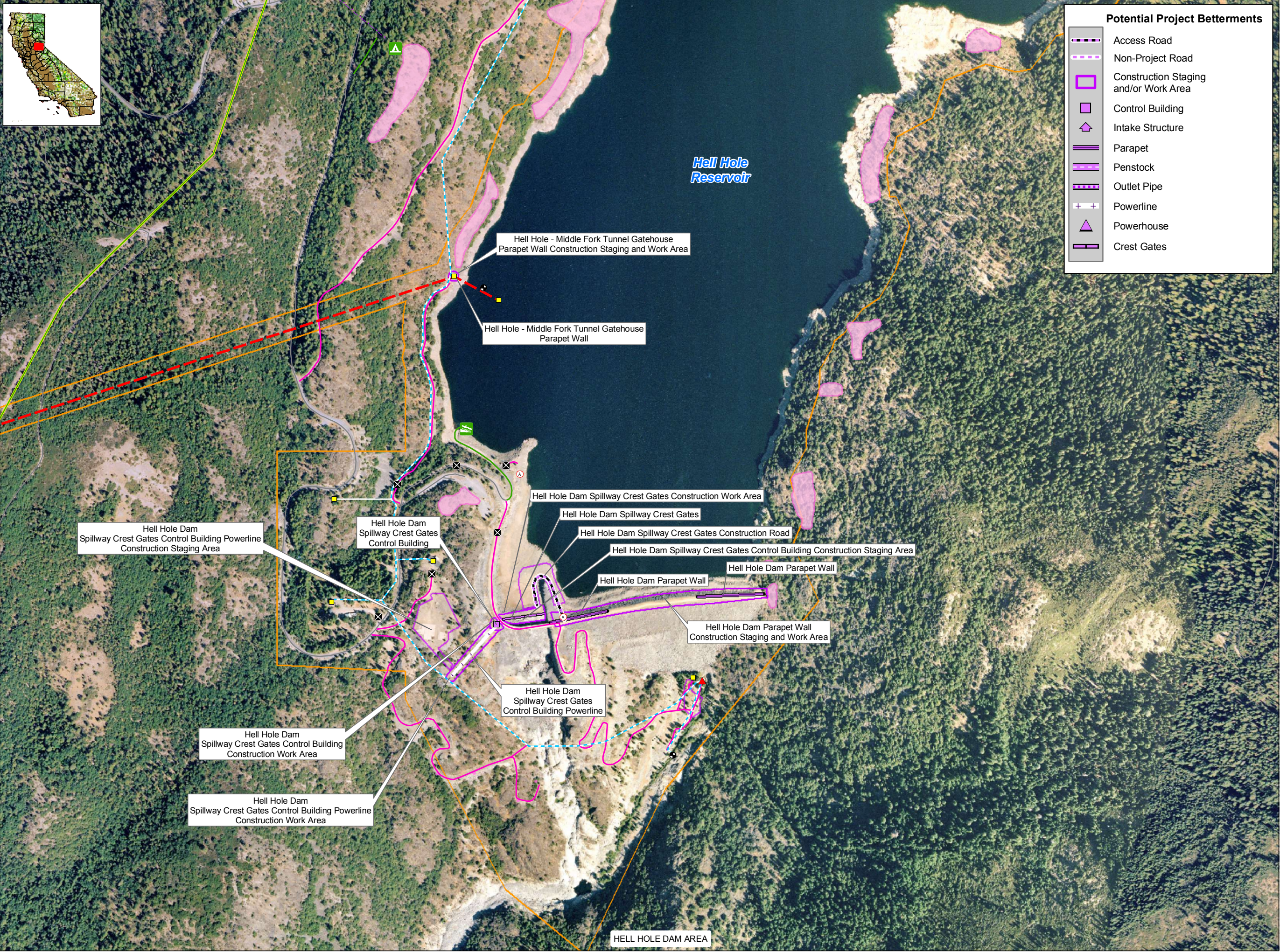
Placer County Water Agency  
Middle Fork American River Project  
**Map TERR 2-2e**  
**Location of Special-Status Plant Populations in Relation to Existing Project Facilities and Features, Project Recreation Facilities, and Dispersed Concentrated Use Areas**  
**Upper Hell Hole Area**

Projection: Ca. Stateplane, Zone 2  
Datum: NAD 83  
Date: 2/3/09









**Potential Project Betterments**

- Access Road
- Non-Project Road
- Construction Staging and/or Work Area
- Control Building
- Intake Structure
- Parapet
- Penstock
- Outlet Pipe
- Powerline
- Powerhouse
- Crest Gates

**PCWA Facilities and Features**

- Dam
- Ancillary and Other Facilities
- Powerhouse
- Gage
- Penstock
- Tunnel
- Gate
- Access Point
- Public Safety Fence
- FERC Boundary

**Project Power and Communication Lines:**

- Communication
- Power
- Power (underground)
- Communication/Power
- Communication/Power (underground)

**Transportation**

- Road
- Project Road
- Project Trail
- Recreation Access Road

**Project Recreation Facilities**

- Picnic Area
- Boat Ramp
- Scenic Viewpoint
- Developed Campground
- Water Supply Line

**Other Facilities**

PG & E Transmission Lines:

- 230 kV
- 60 kV

**Special-status Plants**

- Stebbins' phacelia population

NOTE: Boundary of the potential betterment-related change in reservoir inundation area to be determined

**PCWA**

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Middle Fork American River Project

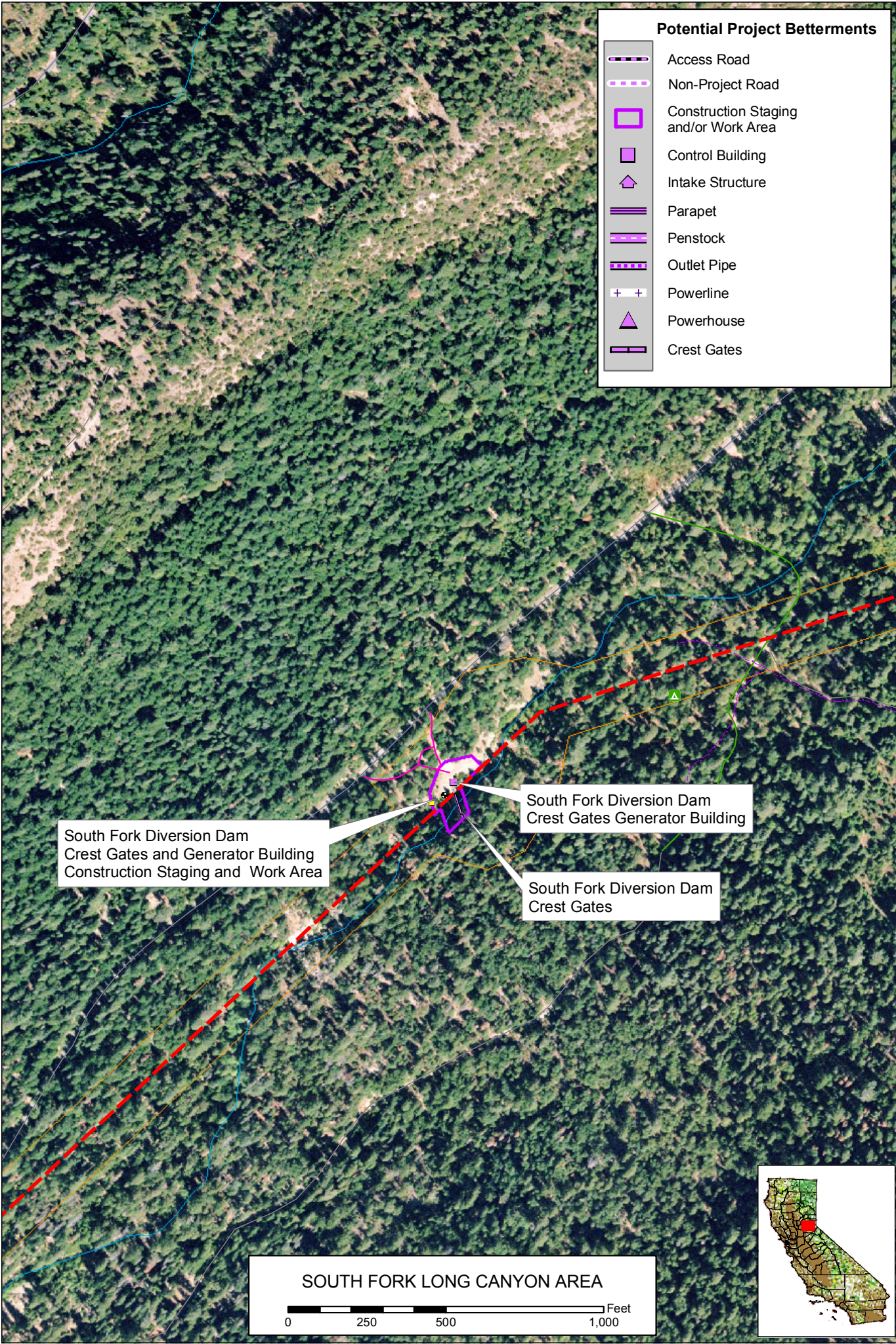
**Map TERR 2-3a**  
**Location of Special-Status Plant Populations**  
**Associated with the Hell Hole Reservoir**  
**Seasonal Storage Increase Betterment**

0 250 500 Feet

Projection: Ca. Stateplane, Zone 2  
Datum: NAD 83

Date: 2/3/09





**Potential Project Betterments**

- Access Road
- Non-Project Road
- Construction Staging and/or Work Area
- Control Building
- Intake Structure
- Parapet
- Penstock
- Outlet Pipe
- Powerline
- Powerhouse
- Crest Gates

**PCWA Facilities and Features**

- Dam
- Ancillary and Other Facilities
- Powerhouse
- Gage
- Penstock
- Tunnel
- Gate
- Access Point
- Public Safety Fence
- FERC Boundary

**Project Power and Communication Lines:**

- Communication
- Power
- Power (underground)
- Communication/Power
- Communication/Power (underground)

**Transportation**

- Road
- Project Road
- Project Trail
- Recreation Access Road

**Project Recreation Facilities**

- Picnic Area
- Boat Ramp
- Scenic Viewpoint
- Developed Campground
- Water Supply Line

**Other Facilities**

PG & E Transmission Lines:

- 230 kV
- 60 kV

**Special-status Plants**

- Stebbins' phacelia population

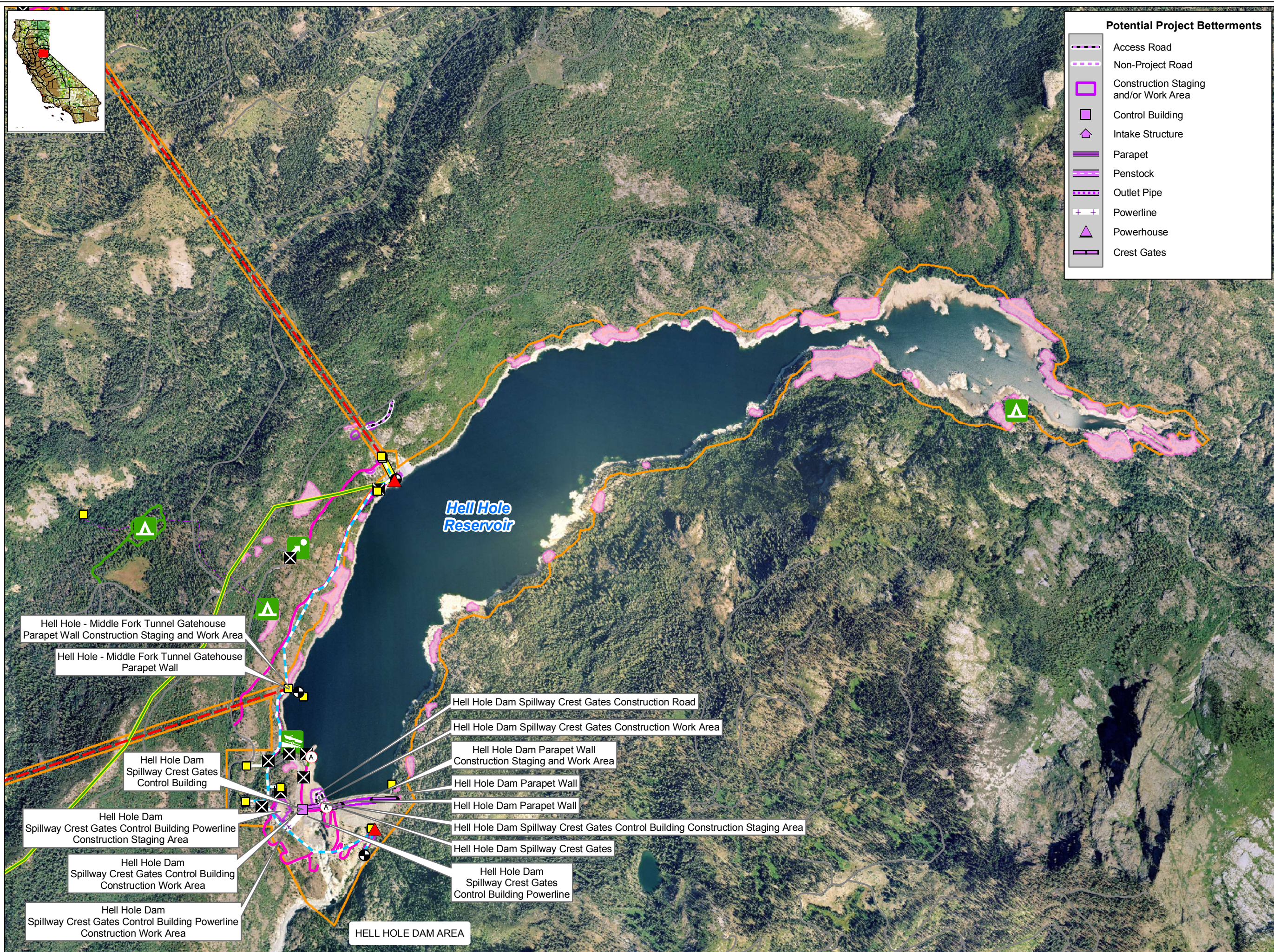
**PCWA**

Placer County Water Agency  
Middle Fork American River Project

**Map TERR 2-3b**  
Location of Special-Status Plant Populations  
Associated with the Hell Hole Reservoir  
Seasonal Storage Increase Betterment

Projection: Ca. Stateplane, Zone 2  
Datum: NAD 83  
Date: 2/3/09





**Potential Project Betterments**

- Access Road
- Non-Project Road
- Construction Staging and/or Work Area
- Control Building
- Intake Structure
- Parapet
- Penstock
- Outlet Pipe
- Powerline
- Powerhouse
- Crest Gates

**PCWA Facilities and Features**

- Dam
- Ancillary and Other Facilities
- Powerhouse
- Gage
- Penstock
- Tunnel
- Gate
- Access Point
- Public Safety Fence
- FERC Boundary

**Project Power and Communication Lines:**

- Communication
- Power
- Power (underground)
- Communication/Power
- Communication/Power (underground)

**Transportation**

- Road
- Project Road
- Project Trail
- Recreation Access Road

**Project Recreation Facilities**

- Picnic Area
- Boat Ramp
- Scenic Viewpoint
- Developed Campground
- Water Supply Line

**Other Facilities**

PG & E Transmission Lines:

- 230 kV
- 60 kV

**Special-status Plants**

- Stebbins' phacelia population

NOTE: Boundary of the potential betterment-related change in reservoir inundation area to be determined

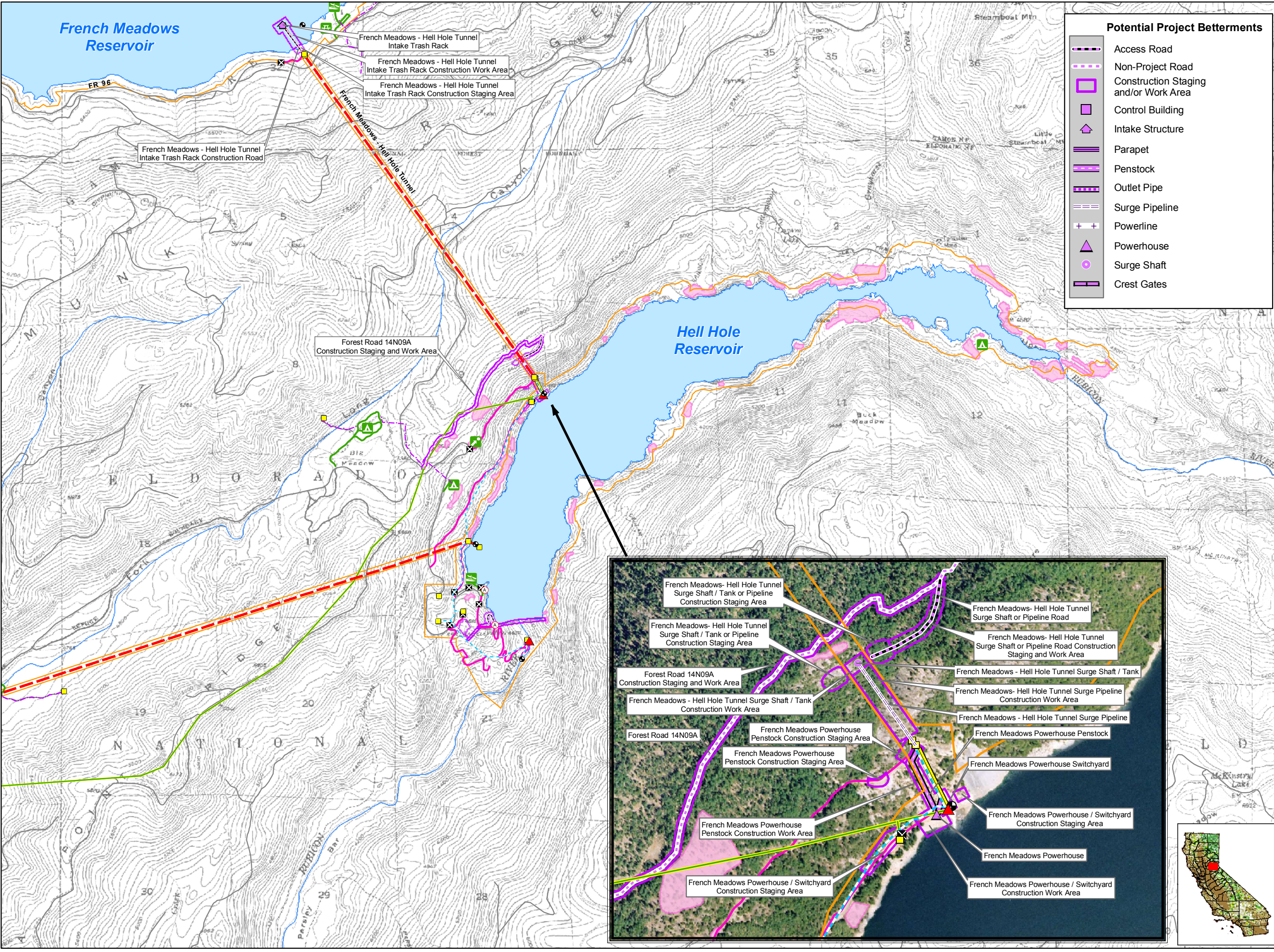
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Placer County Water Agency  
Middle Fork American River Project

**Map TERR 2-3c**  
**Location of Special-Status Plant Populations**  
**Associated with the Hell Hole Reservoir**  
**Seasonal Storage Increase Betterment**

0 250 500 1,000 1,500 2,000 Feet  
Projection: Ca. Stateplane, Zone 2  
Datum: NAD 83  
Date: 2/3/09






- Potential Project Betterments**
- Access Road
  - Non-Project Road
  - Construction Staging and/or Work Area
  - Control Building
  - Intake Structure
  - Parapet
  - Penstock
  - Outlet Pipe
  - Surge Pipeline
  - Powerline
  - Powerhouse
  - Surge Shaft
  - Crest Gates


- PCWA Facilities and Features**
- Dam
  - Ancillary and Other Facilities
  - Powerhouse
  - Gage
  - Penstock
  - Tunnel
  - Gate
  - Access Point
  - Public Safety Fence
  - FERC Boundary
- Project Power and Communication Lines:**
- Communication
  - Power
  - Power (underground)
  - Communication/Power
  - Communication/Power (underground)
- Transportation**
- Road
  - Project Road
  - Project Trail
  - Recreation Access Road
- Project Recreation Facilities**
- Picnic Area
  - Boat Ramp
  - Scenic Viewpoint
  - Developed Campground
  - Water Supply Line
- Other Facilities**
- PG & E Transmission Lines:
- 230 kV
  - 60 kV
- Special-status Plants**
- Stebbins' phacelia population

NOTE: Boundary of the potential betterment-related change in reservoir inundation area to be determined



Placer County Water Agency  
Middle Fork American River Project

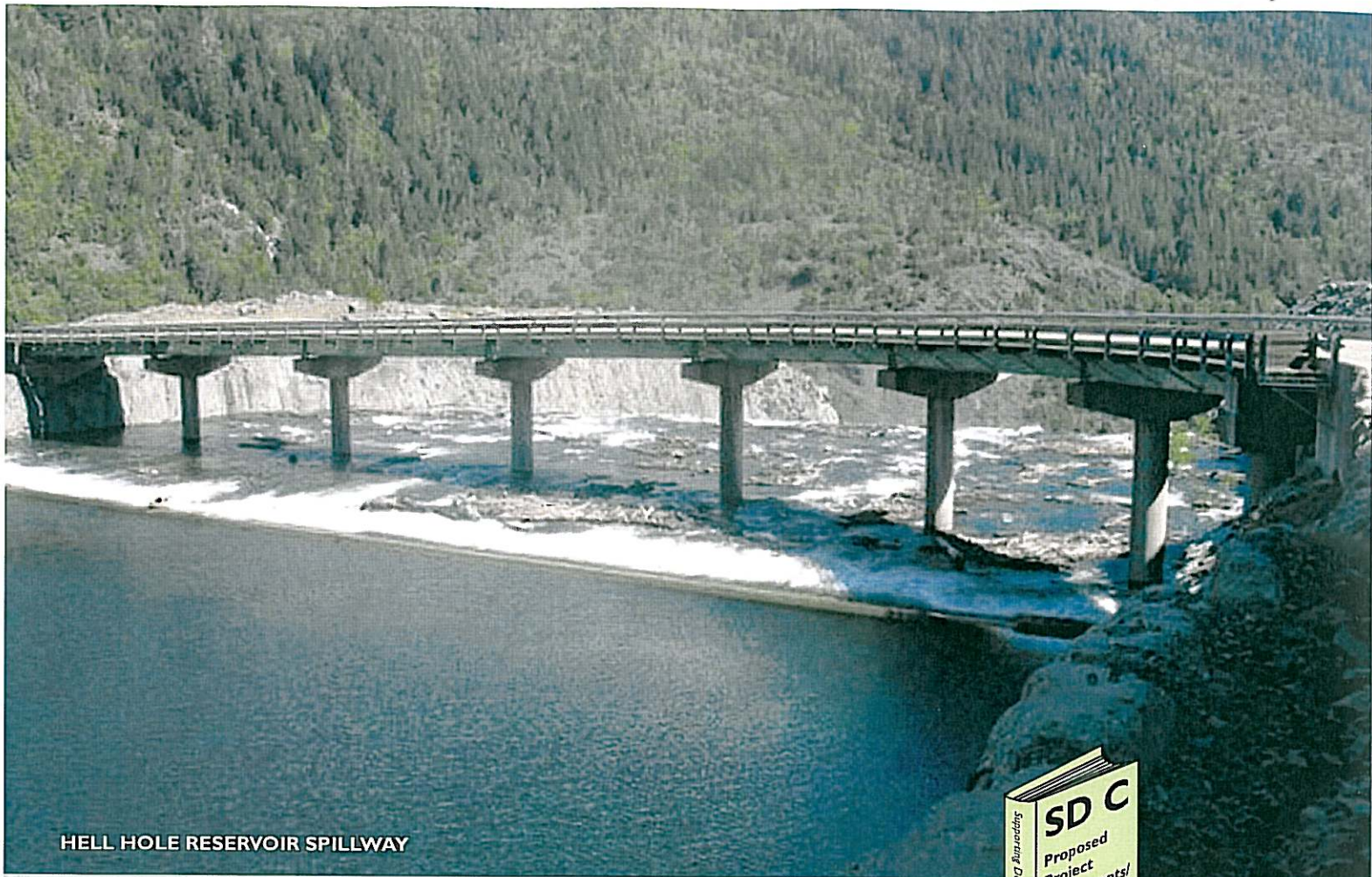
**Map TERR 2-3d**  
**Location of Special-Status Plant Populations**  
**Associated with the French Meadows**  
**Powerhouse Capacity Upgrade Betterment**



0 0.25 0.5 Miles  
Projection: Ca. Stateplane, Zone 2  
Datum: NAD 83  
Date: 2/3/09



**APPENDIX A**  
**Description of Potential Project Betterments**



HELL HOLE RESERVOIR SPILLWAY

# Project Betterments/ Improvements

IN PREPARATION FOR THE RELICENSING OF THE MFP, PCWA conducted an assessment to identify potential modifications or additions (betterments) to existing Project facilities that would improve operations or maintenance of the Project, and result in an increase in net or peaking generation. As a result of this assessment, PCWA is including the following three potential Project betterments in the PAD:

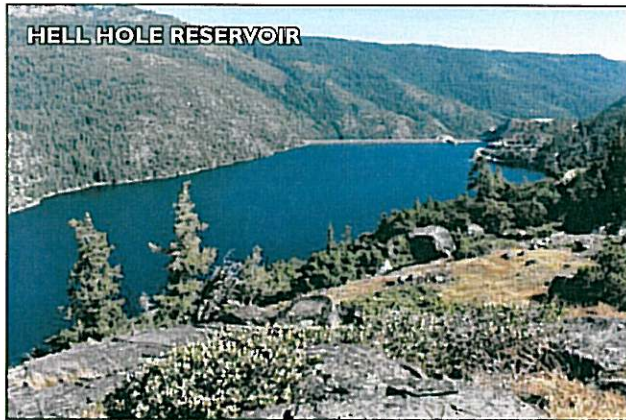
- Hell Hole Reservoir Seasonal Storage Increase
- French Meadows Powerhouse Capacity Upgrade
- Ralston Powerhouse Capacity Upgrade

PCWA intends to further evaluate these potential betterments during relicensing with respect to their engineering and economic feasibility and the potential protection, mitigation, or enhancement measures that may be necessary to address potential effects on environmental and cultural resources. The specific Project betterments to be included in the License Application will be determined after reviewing the results of on-going engineering, economic, cultural, and environmental studies in relation to potential future license conditions.



## HELL HOLE RESERVOIR SEASONAL STORAGE INCREASE

The purpose of this betterment would be to seasonally increase the storage capacity of Hell Hole Reservoir. The betterment would utilize a portion of the existing flood control pool, above the present normal maximum operating water level, to store additional water during the spring and summer after the peak of the runoff period. An approximate 9,750 ac-ft to 12,000 ac-ft increase in seasonal storage in the reservoir would be achieved by installing 8-10 foot high crest gates on the existing dam spillway. The crest gates would be raised when needed to increase reservoir storage. Operation of the crest gates would also seasonally increase the reservoir's inundation area within the existing flood pool by approximately 37 acres.



Installation of spillway gates on Hell Hole Reservoir will increase seasonal storage and power generation.

In years when either French Meadows or Hell Hole reservoirs would have spilled, this betterment would allow the MFP to capture additional water in storage in Hell Hole Reservoir which can later be used to increase net annual energy generation. In all but the driest years, the betterment would also allow the MFP to shift the timing of some generation from the spring run-off period to the summer peak energy demand period. While the shift in the timing of the generation will not increase total annual MFP generation, it will increase the benefit of the Project by increasing generation during the peak energy demand period. This betterment would require a new water right to allow for additional storage at Hell Hole Reservoir.

This betterment would require the following modifications to existing Project facilities:

- Hell Hole Dam Spillway - install 8-10 foot-high crest gates on the existing concrete spillway
- Hell Hole Dam - install 2 foot-high parapet walls on each end of the existing dam to maintain minimum freeboard requirements, if 10 foot-high crest gates are installed
- French Meadow Powerhouse - install 4 foot-high parapet wall at the powerhouse to avoid inundation from wave action when the reservoir is at its maximum water surface elevation
- Hell Hole - Middle Fork Tunnel Gatehouse - install 4 foot-high parapet wall around the gatehouse to avoid inundation from wave action
- South Fork Long Canyon Diversion Dam - install 3 foot-high crest gates on the diversion dam or a check valve at the drop inlet to avoid the backflow of water from the Hell Hole - Middle Fork Tunnel into South Fork Long Canyon Creek when Middle Fork Powerhouse is not operating

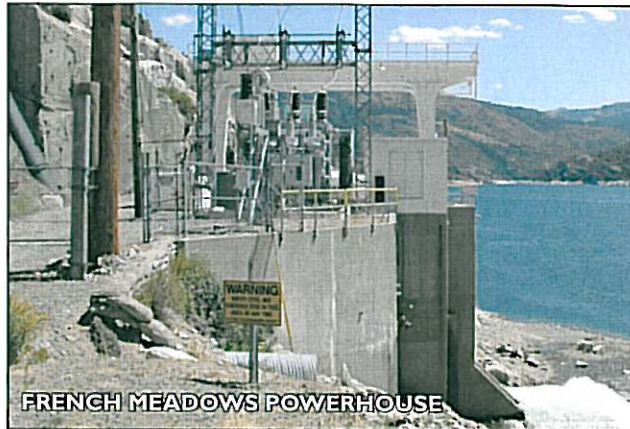
The betterment would also require construction of three new Project facilities including:

- Hell Hole Dam Spillway Crest Gates Control Building - construct a small control building adjacent to the spillway to provide power to operate the spillway crest gates
- Hell Hole Dam Spillway Crest Gates Control Building Powerline - construct a short spur line (approximately 525 feet) from the control building to an existing powerline to provide power for spillway crest gate operations
- South Fork Long Canyon Diversion Dam Generator Building - construct a control building with a generator to provide power to operate the crest gate

## FRENCH MEADOWS POWERHOUSE CAPACITY UPGRADE

The purpose of this betterment would be to increase the generating capacity of the existing French Meadows Powerhouse from 15.3 MW to approximately 30 MW. Generating capacity would be increased by adding a second powerhouse immediately adjacent to the existing powerhouse. The existing French Meadows Powerhouse is only able to utilize approximately one-half of the maximum hydraulic capacity of the French Meadows - Hell Hole Tunnel. The addition





**The addition of a second French Meadows Powerhouse will allow PCWA to increase peaking generation.**

of a second unit would allow the maximum hydraulic capacity of the tunnel to be used to transport more water over a shorter period of time from French Meadows Reservoir to Hell Hole Reservoir, thereby increasing the MFP's peaking generation capabilities. This betterment would require a new water right to allow for an increase in the permitted direct diversion rate from French Meadows Reservoir to Hell Hole Reservoir.

The new powerhouse would also increase the capability of the MFP to supply electrical grid support services. The new generating unit could be operated simultaneously or independently of the existing generating unit. The existing PG&E 60-kV French Meadows - Middle Fork Transmission Line will be used to interconnect the new powerhouse with the PG&E transmission system.

This betterment would require the following modifications to existing Project facilities:

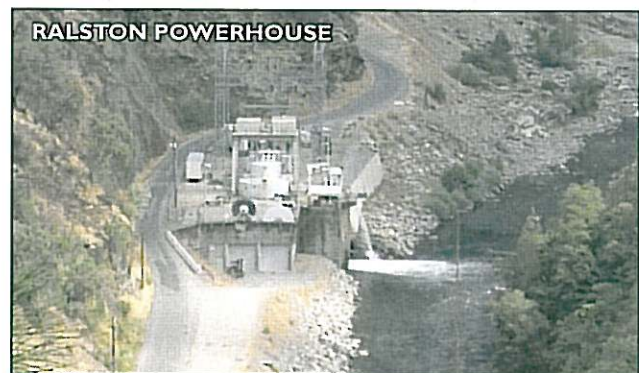
- French Meadows - Hell Hole Tunnel Intake Trash Rack - possible replacement of the existing cylindrical trash rack with a larger trash rack to reduce head losses and allow greater volume of water to flow into the tunnel
- French Meadows Powerhouse Switchyard - expand the existing switchyard to include additional buswork, transformers, and electrical switching equipment necessary to convey the additional power generated at the new powerhouse
- Middle Fork Powerhouse Upper Switchyard - upgrade the transformers and switchgear at the existing 60kV substation at Middle Fork Interbay to handle the additional power transfer

This betterment would also require construction of the following new Project facilities:

- French Meadows Powerhouse - construct a second powerhouse with installed generating capacity of approximately 15 MW immediately adjacent to existing powerhouse
- French Meadows Powerhouse Penstock - construct a second penstock, parallel to the existing penstock, to provide water to the new powerhouse
- Additional Surge Capacity Facility - develop additional surge capacity through construction of a surge shaft, surge shaft and tank, or surge pipeline located above the French Meadows - Hell Hole Tunnel Portal, or installation of a bypass valve in the new powerhouse
- French Meadows - Hell Hole Tunnel Surge Shaft or Pipeline Access Road - construct a new Project road from an existing Forest Service road to the surge shaft or pipeline and temporarily improve the existing Forest Service road

#### **RALSTON POWERHOUSE CAPACITY UPGRADE**

The purpose of this betterment is to improve the operating efficiency of the Middle Fork - Ralston system by increasing the hydraulic capacity of Ralston Powerhouse to match Middle Fork Powerhouse throughput, plus accretions at Middle Fork Interbay. This betterment would allow the MFP to maximize peaking generation during periods of high energy demand, thereby increasing the overall benefit of the MFP. This betterment would only require upgrades to electrical and mechanical equipment within the Ralston Powerhouse. This betterment may result in the ability of Ralston Powerhouse to utilize more than 1,000 cfs, in which case a new water right will be needed.



**The Ralston Powerhouse upgrade will increase peaking generation opportunities.**



## **APPENDIX B**

### **Target Special-Status Plant Species for the TERR 2 Special-Status Plant and Moss Surveys**

Target Special-Status Plant Species for the TERR 2 Special-Status Plant and Moss Surveys.

Scientific Name	Common Name	Federal Status	State Status	CNPS List	Blooming Period/Fertile	Habitat
<i>Allium tribracteatum</i>	three-bracted onion	FSS <sup>1</sup>	–	1B.2	April–August	Chaparral, lower montane coniferous forest and upper montane coniferous forest. From 3,600 to 9,800 feet in elevation.
<i>Arctostaphylos nissenana</i>	Nissenan manzanita	FSS <sup>1</sup>	–	1B.2	February–March	Open, rocky ridges and acidic shale and slate soils in chaparral and closed-cone coniferous forests. Found in almost pure colonies on hard shale substrate primarily where other shrubs and trees are absent. From 1,450 to 3,600 feet in elevation.
<i>Astragalus webberi</i>	Webber's milk-vetch	FSS <sup>2</sup>	–	1B.2	May–July	Lower montane coniferous forest. From 2,400 to 3,700 feet in elevation.
<i>Atractylodes flagellatus</i>	flagella-like atractylodes	–	–	2.2	N/A	Cismontane woodlands. From 300 to 1,600 feet in elevation.
<i>Balsamorhiza hirsuta</i> var. <i>hirsuta</i>	big-scale balsamroot	FSS <sup>1</sup>	–	1B.2	March–June	Chaparral, cismontane woodland, valley and foothill grassland, and vernal moist meadows on sandstone, serpentine, or basalt outcrops. From 300 to 4,600 feet in elevation.
<i>Botrychium ascendens</i>	upswept moonwort	FSS <sup>3</sup>	–	2.3	Fertile July–August	Lower montane coniferous forests near streams, grassy fields, meadows and seeps. From 4,800 to 7,300 feet in elevation.
<i>Botrychium crenulatum</i>	scalloped moonwort	FSS <sup>3</sup>	–	2.2	Fertile June–July	Lower and upper montane coniferous forests, bogs, fens, and moist meadows. From 4,900 to 10,800 feet in elevation.
<i>Botrychium lunaria</i>	common moonwort	FSS <sup>3</sup>	–	2.3	August	Meadows and seeps, moist riparian areas, subalpine coniferous forest and upper montane coniferous forest. From 7,500 to 11,000 feet elevation.
<i>Botrychium missouriense</i>	missouri moonwort	FSS <sup>3</sup>	–	2.2	July–September	Mesic areas in lower and upper montane coniferous forest, moist riparian areas, and meadows and seeps. From 4,000 to 6,700 feet in elevation
<i>Botrychium montanum</i>	mountain moonwort (western goblin)	FSS <sup>3</sup>	–	2.1	July–September	Lower and upper montane coniferous forests, and meadows and seeps. From 4,500 to 7,000 feet in elevation.
<i>Bruchia bolanderi</i>	Bolander's bruchia	FSS <sup>3</sup>	–	2.2	N/A	Lower and upper montane coniferous forest, meadows, seeps, and fens in damp soils. From 4,000 to 9,500 feet in elevation.
<i>Calochortus clavatus</i> var. <i>avicus</i>	Pleasant Valley mariposa lily	FSS <sup>3</sup>	–	1B.2	March–June	In openings, often south-facing slopes and ridgetops, of lower montane coniferous forests with Josephine silt loam and volcanic soils. From 1,000 to 6,300 feet in elevation.
<i>Chlorogalum grandiflorum</i>	Red Hills soaproot	–	–	1B.2	May–June	Cismontane woodland, chaparral, and lower montane coniferous forests on serpentine or gabbro soils. From 850 to 3,500 feet in elevation.
<i>Clarkia biloba</i> ssp. <i>brandegeae</i>	Brandegee's clarkia	FSS <sup>2</sup>	–	1B.2	May–July	Chaparral, cismontane woodland, often roadcuts. From 950 to 3,200 feet in elevation.
<i>Cypripedium fasciculatum</i>	clustered lady's-slipper	FSS <sup>2</sup>	–	4.2	March–August	Lower montane coniferous forest, serpentine seeps and streambanks. From 500 to 7,200 feet in elevation.
<i>Cypripedium montanum</i>	mountain lady's-slipper	FSS <sup>3</sup>	–	4.2	March–August	Broad-leaved upland and lower montane coniferous forests in moist areas or on dry shaded slopes with northern aspects and loam soils. From 600 to 7,500 feet in elevation.
<i>Epilobium howellii</i>	subalpine fireweed	FSS <sup>3</sup>	–	1B.3	July–August	Mesic areas in subalpine coniferous forest, wet meadows, fens, and mossy seeps. From 6,000 to 9,000 feet in elevation.
<i>Epilobium oregonum</i>	Oregon fireweed		–	1B.2	June–September	Bogs, fens, meadows, small streams and ditches in lower and upper montane coniferous forests. From 1,600 to 8,500 feet in elevation.
<i>Erigeron miser</i>	starved fleabane	FSS <sup>2</sup>	–	1B.3	June–October	Upper montane coniferous forest, rocky soils. From 6,000 to 8,600 feet in elevation.
<i>Eriogonum tripodum</i>	tripod buckwheat	FSS <sup>1</sup>	–	4.2	May–July	Chaparral, cismontane woodlands, often on serpentine outcroppings. From 650 to 5,250 feet in elevation.

Target Special-Status Plant Species for the TERR 2 Special-Status Plant and Moss Surveys (continued).

Scientific Name	Common Name	Federal Status	State Status	CNPS List	Blooming Period/Fertile	Habitat
<i>Eriogonum umbellatum</i> var. <i>torreyanum</i>	Donner Pass buckwheat	FSS <sup>2</sup>	–	1B.2	July–September	Upper montane coniferous forests, chaparral, and meadows. Volcanic and rocky soils. From 6,000 to 8,000 feet in elevation.
<i>Fissidens aphelotaxifolius</i>	brook pocket-moss	FSS <sup>2</sup>	–	2.2	N/A	Lower and upper montane coniferous forest, rock, stream channels and waterfalls. From 6,500 to 7,200 feet in elevation
<i>Fritillaria eastwoodiae</i>	Butte County fritillary	FSS <sup>2</sup>	–	3.2	March–May	Chaparral, cismontane woodland, lower montane coniferous forest (openings), wet and dry slopes red clay or sandy loam. From 100 to 5,000 feet in elevation.
<i>Helodium blandowii</i>	Blandow's bog-moss	FSS <sup>3</sup>	–	2.3	N/A	Meadows, seeps, fens, and subalpine coniferous forest; damp soil. From 6,500 to 8,900 feet in elevation.
<i>Horkelia parryi</i>	Parry's horkelia	FSS <sup>1</sup>	–	1B.2	April–June	Chaparral, cismontane woodland on stony, disturbed sites with slightly acidic soils. From 250 to 3,600 feet in elevation.
<i>Ivesia aperta</i> var. <i>aperta</i>	Sierra Valley mousetail	FSS <sup>2</sup>	–	1B.2	June—September	Great Basin scrub, lower montane coniferous forest, meadows and seeps, pinyon and juniper woodland, vernal pools - vernally mesic, usually volcanic. From 4,500 to 7,500 feet in elevation.
<i>Ivesia aperta</i> var. <i>canina</i>	Dog Valley mousetail	FSS <sup>2</sup>	–	1B.1	June–August	Openings in lower montane coniferous forests and in meadows and seeps. Volcanic and rocky soils. From 4,500 to 7,500 feet in elevation.
<i>Ivesia sericoleuca</i>	Plumas mousetail	FSS <sup>2</sup>	–	1B.2	May–September	Great Basin scrub, lower montane coniferous forest, meadows and seeps, and vernal pools. From 4,500 to 7,500 feet in elevation.
<i>Ivesia webberi</i>	Webber's mousetail	FC FSS <sup>2</sup>		1B.1	May–July	Great Basin scrub, lower montane coniferous forest, in sandy or gravelly soils. From 4,500 to 7,500 feet in elevation.
<i>Lewisia cantelovii</i>	Cantelow's lewisia	FSS <sup>2</sup>	–	1B.2	May–October	Broadleaf upland, chaparral, cismontane woodlands, and lower montane coniferous forests. From 1,000 to 4,500 feet in elevation
<i>Lewisia kelloggii</i> ssp. <i>Hutchisonii</i>	Hutchison's lewisia (subspecies <i>hutchisonii</i> )	FSS <sup>3</sup>	–	3.3	July–August	Decomposed granite and slate soils (volcanic soils), at the north sides of passes and ridge-tops from 5,200 to 7,000 feet in elevation.
<i>Lewisia kelloggii</i> ssp. <i>Kelloggii</i>	Hutchison's lewisia (subspecies <i>kelloggii</i> )	FSS <sup>3</sup>	–	–	July–August	Upper montane coniferous forest, rocky open ridges and granitic and volcanic balds. From 5,000 to 9,000 feet in elevation.
<i>Lewisia serrata</i>	saw-toothed lewisia	FSS <sup>3</sup>	–	1B.1	May–June	Broad-leaved upland forest, lower montane coniferous forest, and riparian forest on mesic steep, nearly vertical cliffs and inner gorges. From 2,800 to 4,800 feet in elevation.
<i>Lupinus dalesiae</i>	Quincy lupine	FSS <sup>2</sup>	–	4.2	May–August	Lower and upper montane coniferous forests. From 3,000 to 8,000 feet in elevation.
<i>Meesia triquetra</i>	three-ranked hump moss	FSS <sup>3</sup>	–	4.2	N/A	In acidic montane meadows. From 4,250 to 9,700 feet in elevation.
<i>Meesia uliginosa</i>	broad-nerved hump moss	FSS <sup>3</sup>	–	2.2	N/A	Bogs, fens, and rock fissures, upper montane and subalpine coniferous forests, meadows and seeps in damp soil. From 4,250 to 9,500 feet in elevation.
<i>Mielichhoferia elongata</i>	elongate copper-moss	FSS <sup>2</sup>		2.2	N/A	Cismontane woodland, rock with copper/heavy metals. From 1,500 and 4,250 feet in elevation
<i>Monardella folletti</i>	Follett's mountainbalm	FSS <sup>2</sup>	–	1B.2	June–September	Lower montane coniferous forests in rocky, serpentine soils. From 1,650 to 6,550 feet in elevation.
<i>Navarretia prolifera</i> ssp. <i>lutea</i>	yellow bur navarretia	FSS <sup>1</sup>	–	4.3	May–July	Chaparral, cismontane woodland. Dry rocky flats, often on Ledmount soils. Often on lava caps or other openings, rocky ridgelines, saddles, and eroding ephemeral drainages. From 2,300 to 5,000 feet in elevation.
<i>Ophioglossum pusillum</i>	northern adder's tongue	–	–	2.2	July	Margins of marshes and swamps and mesic areas of Valley and foothill grasslands. From 3,280 to 6,500 feet in elevation

Target Special-Status Plant Species for the TERR 2 Special-Status Plant and Moss Surveys (continued).

Scientific Name	Common Name	Federal Status	State Status	CNPS List	Blooming Period/Fertile	Habitat
<i>Packera layneae</i> ( <i>Senecio layneae</i> )	Layne's ragwort	FT FSS <sup>1</sup>	SR	1B.2	April–July	Chaparral and cismontane woodland on rocky, gabbroic, serpentine or ultramafic soils. From 650 to 3,400 feet in elevation.
<i>Peltigera hydrothyria</i> ( <i>Hydrothyria venosa</i> )	veined water lichen	FSS <sup>3</sup>	–	–	N/A	Aquatic, in spring-fed streams with clear, cold water. From 1,150 to 7,000 feet in elevation.
<i>Penstemon personatus</i>	close-throated beardtongue	FSS <sup>2</sup>	–	1B.2	June–September	Chaparral and upper and lower montane coniferous forests. From 3,400 to 7,000 feet in elevation.
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	FSS <sup>3</sup>	–	1B.2	June–July	Cismontane woodland and lower montane coniferous forest, and meadows and seeps. Found on dry, open rocky sites (bedrock outcrops, rubble, or talus) on ledges and moderate or steep slopes as well as inner gorges and near seeps on ENF and TNF. From 2,000 to 7,050 feet in elevation.
<i>Pyrrocoma lucida</i>	sticky goldenweed	FSS <sup>2</sup>	–	1B.2	July–October	Great Basin scrub, lower montane coniferous forest, and meadows and seeps. May grow in alkaline clays. From 2,250 to 6,250 feet in elevation.
<i>Rorippa subumbellata</i>	Tahoe yellow cress	FC	SE	1B.1	May–September	Lower montane coniferous forests, meadows and seeps, sandy (granitic) lake margins. From 6,050 to 6,250 feet in elevation.
<i>Scutellaria galericulata</i>	rarsh skullcap	–	–	2.2	June–September	Lower montane coniferous forest, marshes and swamps, meadows and seeps. From 0 to 6,900 feet in elevation.
<i>Tauschia howelli</i>	Howell's tauschia	FSS <sup>2</sup>	–	1B.3	June–August	Subalpine /upper montane coniferous forest, granitic, gravelly soils. From 5,500 to 8,500 feet in elevation.

LEGEND:

Federal Status  
FT = Federal Threatened  
FE = Federal Endangered  
FC = Federal Candidate  
FSS<sup>1</sup> = Forest Service Sensitive, Eldorado National Forest  
FSS<sup>2</sup> = Forest Service Sensitive, Tahoe National Forest  
FSS<sup>3</sup> = Forest Service Sensitive, Eldorado and Tahoe National Forests

State Status  
SR = listed by California as Rare  
ST = California Threatened  
SE = California Endangered

CNPS Status (California Native Plant Society)  
1B = rare, threatened or endangered in California and elsewhere.  
2 = rare in California but more common elsewhere.  
3 = need more information  
4 = plants of limited distribution; a watch list.  
\_.1 = Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)  
\_.2 = Fairly endangered in California (20-80% occurrences threatened)  
\_.3 = Not very endangered in California (<20% of occurrences threatened or no current threats known)

## **APPENDIX C**

### **Terrestrial, Aquatic, and Riparian Plants and Mosses Identified in the Study Area**



## Appendix C. Terrestrial, Aquatic, and Riparian Plants and Mosses Identified in the Study Area.

Scientific Name	Common Name	Family	Native/ Non-Native Species	Status <sup>1</sup>	Terrestrial Surveys	Aquatic/ Riparian Surveys
<b>Special-Status Plants Identified in the Study Area</b>						
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	Hydrophyllaceae	native	FSS <sup>3</sup> CNPS 1B.2	X	
<b>Common Plants Identified in the Study Area</b>						
<i>Abies concolor</i>	white fir	Pinaceae	native	–	X	X
<i>Abies magnifica</i>	California red fir	Pinaceae	native	–	X	X
<i>Acer glabrum</i>	Rocky Mountain maple	Aceraceae	native	–	X	X
<i>Acer glabrum</i> var. <i>torreyi</i>	mountain maple	Aceraceae	native	–	X	X
<i>Acer macrophyllum</i>	bigleaf maple	Aceraceae	native	–	X	X
<i>Achillea millefolium</i>	yarrow	Asteraceae	native	–	X	
<i>Achnatherum nelsonii</i> ssp. <i>dorei</i>	Dore's Needlegrass, mountain needlegrass	Poaceae	native	–	X	
<i>Achnatherum occidentale</i> ssp. <i>occidentale</i>	western needlegrass	Poaceae	native	–	X	
<i>Achnatherum occidentale</i> ssp. <i>pubescens</i>	Elmer's needlegrass	Poaceae	native	–	X	
<i>Aconitum columbianum</i>	monkshood	Ranunculaceae	native	–	X	
<i>Adenocaulon bicolor</i>	American trailplant	Asteraceae	native	–	X	X
<i>Adiantum jordanii</i>	California maiden-hair	Pteridaceae	native	–	X	
<i>Aesculus californica</i>	California buckeye	Hippocastanaceae	native	–	X	X
<i>Agastache urticifolia</i>	nettleleaf giant hyssop	Lamiaceae	native	–	X	X
<i>Ageratina occidentalis</i>	western snakeroot	Asteraceae	native	–	X	X
<i>Agoseris heterophylla</i>	annual agoseris	Asteraceae	native	–	X	
<i>Agoseris retrorsa</i>	spearleaf agoseris	Asteraceae	native	–	X	
<i>Agrostis capillaris</i>	colonial bent grass	Poaceae	non-native	–	X	X
<i>Agrostis exarata</i>	spike bentgrass	Poaceae	native	–	X	X
<i>Agrostis idahoensis</i>	Idaho bentgrass	Poaceae	native	–	X	X
<i>Agrostis oregonensis</i>	Oregon bentgrass	Poaceae	native	–	X	X
<i>Agrostis pallens</i>	seashore bentgrass	Poaceae	native	–	X	X
<i>Agrostis stolonifera</i>	creeping bentgrass	Poaceae	non-native	–	X	X
<i>Agrostis variabilis</i>	mountain bentgrass	Poaceae	native	–		X
<i>Agrostis x polypogon</i>	Agrostis-Polypogon hybrid	Poaceae	non-native	–	X	
<i>Ailanthus altissima</i>	tree-of-heaven	Simaroubaceae	non-native	–	X	
<i>Aira caryophylla</i>	silver hairgrass	Poaceae	non-native	–	X	
<i>Alisma plantago-aquatica</i>	common water plantain	Alismataceae	native	–		X
<i>Allium amplexans</i>	narrowleaf onion	Liliaceae	native	–	X	
<i>Allium campanulatum</i>	dusky onion	Liliaceae	native	–	X	
<i>Allophyllum divaricatum</i>	purple false gilia	Polemoniaceae	native	–	X	
<i>Allophyllum integrifolium</i>	white false gilia	Polemoniaceae	native	–	X	

## Appendix C. Terrestrial, Aquatic, and Riparian Plants and Mosses Identified in the Study Area.

Scientific Name	Common Name	Family	Native/ Non-Native Species	Status <sup>1</sup>	Terrestrial Surveys	Aquatic/ Riparian Surveys
<i>Alnus incana ssp. tenuifolia</i>	mountain alder	Betulaceae	native	–	X	X
<i>Alnus rhombifolia</i>	white alder	Betulaceae	native	–	X	X
<i>Alopecurus pratensis</i>	meadow foxtail	Poaceae	non-native	–	X	
<i>Amaranthus albus</i>	prostrate pigweed	Amaranthaceae	non-native	–	X	
<i>Amaranthus californicus</i>	California pigweed	Amaranthaceae	native	–	X	X
<i>Amaranthus sp.</i>	amaranth	Amaranthaceae	non-native	–	X	
<i>Amblystegium serpens</i>	amblystegium moss	Amblystegiaceae	native	–		X
<i>Amelanchier alnifolia</i>	service-berry	Rosaceae	native	–	X	X
<i>Amelanchier alnifolia var. pumila</i>	service-berry	Rosaceae	native	–	X	X
<i>Anacolia menziesii</i>	Menzies' anacolia moss	Bartramiaceae	native	–	X	
<i>Anaphalis margaritacea</i>	pearlyeverlasting	Asteraceae	native	–	X	X
<i>Angelica breweri</i>	Brewer's angelica	Apiaceae	native	–	X	
<i>Antennaria media</i>	Rocky Mountain pussytoes	Asteraceae	native	–	X	
<i>Antennaria rosea ssp. rosea</i>	rosy pussytoes	Asteraceae	native	–	X	
<i>Antirrhinum vexillo-calyculatum ssp. intermedium</i>	intermediate sail flower snapdragon	Scrophulariaceae	native	–	X	
<i>Antitrichia californica</i>	California antitrichia moss	Leucodontaceae	native	–		X
<i>Apocynum androsaemifolium</i>	smooth mountain dogbane, bitter dogbane	Apocynaceae	native	–	X	X
<i>Apocynum cannabinum</i>	Indianhemp	Apocynaceae	native	–	X	X
<i>Aquilegia formosa</i>	western columbine	Ranunculaceae	native	–	X	X
<i>Arabis glabra</i>	smooth rock cress	Brassicaceae	native	–	X	X
<i>Arabis glabra var. glabra</i>	tower rockcress	Brassicaceae	native	–	X	
<i>Arabis holboellii var. retrofracta</i>	second rockcress	Brassicaceae	native	–	X	
<i>Arabis platysperma var. platysperma</i>	pioneer rockcress	Brassicaceae	native	–	X	
<i>Arabis suffrutescens var. suffrutescens</i>	woody rockcress	Brassicaceae	native	–	X	
<i>Aralia californica</i>	California spikenard	Araliaceae	native	–	X	X
<i>Arbutus menziesii</i>	madrone	Ericaceae	native	–	X	X
<i>Arctostaphylos glauca</i>	bigberry manzanita	Ericaceae	native	–		X
<i>Arctostaphylos manzanita ssp. manzanita</i>	whiteleaf manzanita	Ericaceae	native	–	X	
<i>Arctostaphylos nevadensis</i>	pinemat manzanita	Ericaceae	native	–	X	
<i>Arctostaphylos patula</i>	greenleaf manzanita	Ericaceae	native	–	X	X
<i>Arctostaphylos viscida</i>	whiteleaf manzanita	Ericaceae	native	–	X	
<i>Arctostaphylos viscida ssp. viscida</i>	smooth white manzanita	Ericaceae	native	–	X	
<i>Arenaria serpyllifolia ssp. serpyllifolia</i>	thymeleaf sandwort	Caryophyllaceae	non-native	–	X	
<i>Arnica cordifolia</i>	heartleaf amica	Asteraceae	native	–	X	
<i>Arnica parryi</i>	Parry's amica	Asteraceae	native	–	X	
<i>Artemisia douglasiana</i>	Douglas' sagewort	Asteraceae	native	–	X	X

## Appendix C. Terrestrial, Aquatic, and Riparian Plants and Mosses Identified in the Study Area.

Scientific Name	Common Name	Family	Native/ Non-Native Species	Status <sup>1</sup>	Terrestrial Surveys	Aquatic/ Riparian Surveys
<i>Asclepias cordifolia</i>	heartleaf milkweed	Asclepiadaceae	native	–	X	
<i>Asclepias fascicularis</i>	Mexican whorled milkweed	Asclepiadaceae	native	–	X	X
<i>Aspidotis densa</i>	Indian's dream	Pteridaceae	native	–	X	
<i>Aster alpigenus</i> var. <i>andersonii</i>	tundra aster	Asteraceae	native	–		X
<i>Aster breweri</i>	Brewer's aster	Asteraceae	native	–	X	X
<i>Aster eatoni</i>	Eaton's aster	Asteraceae	native	–		X
<i>Aster foliaceus</i> var. <i>lyallii</i>	Lyll aster	Asteraceae	native	–	X	
<i>Aster occidentalis</i>	mountain aster	Asteraceae	native	–	X	X
<i>Aster occidentalis</i> var. <i>occidentalis</i>	western aster	Asteraceae	native	–	X	X
<i>Aster oregonensis</i>	Oregon aster	Asteraceae	native	–	X	
<i>Aster oregonensis</i> ssp. <i>californicus</i>	Oregon flat-topped aster	Asteraceae	native	–	X	X
<i>Aster radulinus</i>	roughleaf aster	Asteraceae	native	–	X	
<i>Astragalus bolanderi</i>	Bolander's milkvetch	Fabaceae	native	–		X
<i>Athyrium filix-femina</i> var. <i>cyclosorum</i>	subarctic ladyfern	Dryopteridaceae	native	–	X	X
<i>Athysanus pusillus</i>	common sandweed	Brassicaceae	native	–	X	
<i>Aulacomnium androgynum</i>	aulacomnium moss	Aulacomniaceae	native	–	X	X
<i>Aulacomnium palustre</i>	aulacomnium moss	Aulacomniaceae	native	–	X	
<i>Avena barbata</i>	slender oat	Poaceae	non-native	–	X	
<i>Avena fatua</i>	wild oat	Poaceae	non-native	–	X	X
<i>Avena sativa</i>	common oat	Poaceae	non-native	–	X	
<i>Baccharis pilularis</i>	coyotebrush	Asteraceae	native	–	X	X
<i>Barbarea orthoceras</i>	American yellowrocket	Brassicaceae	native	–	X	
<i>Berberis aquifolium</i> var. <i>dictyota</i>	prickly Oregon grape, Oregon grape	Berberidaceae	native	–	X	
<i>Bidens frondosa</i>	devil's beggartick	Asteraceae	native	–	X	X
<i>Botrychium multifidum</i>	leathery grapefern	Ophioglossaceae	native	–	X	X
<i>Boykinia major</i>	large boykinia	Saxifragaceae	native	–	X	X
<i>Boykinia occidentalis</i>	western brookfoam	Saxifragaceae	native	–	X	
<i>Brachythecium frigidum</i>	cold brachythecium moss	Brachytheciaceae	native	–	X	X
<i>Brickellia californica</i>	California brickellbush	Asteraceae	native	–	X	X
<i>Briza maxima</i>	greater rattlesnake grass	Poaceae	non-native	–		X
<i>Brodiaea elegans</i>	elegant clusterlily	Liliaceae	native	–	X	
<i>Brodiaea elegans</i> ssp. <i>elegans</i>	elegant clusterlily	Liliaceae	native	–	X	
<i>Bromus anomalus</i>	nodding brome	Poaceae	native	–	X	
<i>Bromus carinatus</i>	California brome	Poaceae	native	–	X	X
<i>Bromus carinatus</i> var. <i>carinatus</i>	California brome	Poaceae	native	–	X	
<i>Bromus ciliatus</i>	fringed brome	Poaceae	native	–		X



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Scientific Name	Common Name	Family	Native/ Non-Native Species	Status <sup>1</sup>	Terrestrial Surveys	Aquatic/ Riparian Surveys
<i>Bromus diandrus</i>	ripgut brome	Poaceae	non-native	–	X	X
<i>Bromus grandis</i>	tall brome	Poaceae	native	–	X	
<i>Bromus hordeaceus</i>	soft chess	Poaceae	non-native	–	X	X
<i>Bromus madritensis ssp. rubens</i>	red brome	Poaceae	non-native	–	X	
<i>Bromus stamineus</i>	roadside brome	Poaceae	non-native	–	X	
<i>Bromus sterilis</i>	poverty brome	Poaceae	non-native	–	X	X
<i>Bromus tectorum</i>	cheatgrass	Poaceae	non-native	–	X	X
<i>Bryum "robustum"</i>	moss	Bryaceae	native	–	X	
<i>Bryum gemmiparum</i>	bryum moss	Bryaceae	native	–	X	
<i>Bryum miniatum</i>	glossy red bryum moss	Bryaceae	native	–	X	
<i>Bryum muehlenbeckii</i>	Muehlenbeck's bryum moss	Bryaceae	native	–	X	
<i>Bryum pallens</i>	bryum moss	Bryaceae	native	–	X	
<i>Bryum pseudotriquetrum</i>	common green bryum moss	Bryaceae	native	–	X	X
<i>Bryum weigellii</i>	Weigel's bryum moss	Bryaceae	native	–	X	
<i>Bucklandiella heterosticha</i>	none	Grimmiaceae	native	–	X	X
<i>Calocedrus decurrens</i>	incense cedar	Cupressaceae	native	–	X	X
<i>Calochortus coeruleus</i>	beavertail grass	Liliaceae	native	–	X	
<i>Calochortus minimus</i>	Sierra mariposa lily	Liliaceae	native	–	X	
<i>Calochortus monophyllus</i>	yellow startulip	Liliaceae	native	–	X	
<i>Calochortus uniflorus</i>	large flowered star tulip	Liliaceae	native	–	X	
<i>Calochortus venustus</i>	butterfly mariposa lily	Liliaceae	native	–	X	
<i>Calycadenia truncata</i>	rosin weed	Asteraceae	native	–		X
<i>Calycanthus occidentalis</i>	sweet shrub, spicebush	Calycanthaceae	native	–	X	
<i>Calyptidium umbellatum</i>	cistanthe	Portulacaceae	native	–	X	X
<i>Calystegia malacophylla</i>	Sierra false bindweed	Convolvulaceae	native	–	X	X
<i>Calystegia occidentalis</i>	chaparral false bindweed	Convolvulaceae	native	–	X	X
<i>Calystegia occidentalis ssp. occidentalis</i>	chaparral false bindweed	Convolvulaceae	native	–		
<i>Campanula prenanthoides</i>	California harebell	Campanulaceae	native	–	X	X
<i>Cardamine oligosperma</i>	Idaho bittercress	Brassicaceae	native	–	X	
<i>Carduus pycnocephalus</i>	Italian thistle	Asteraceae	non-native	–	X	
<i>Carex amplexans</i>	clasping bract sedge	Cyperaceae	native	–	X	X
<i>Carex amplifolia</i>	big leaf sedge	Cyperaceae	native	–		X
<i>Carex angustata</i>	widefruit sedge	Cyperaceae	native	–	X	X
<i>Carex athrostachya</i>	slenderbeak sedge	Cyperaceae	native	–	X	X
<i>Carex deweyana</i>	taperfruit shortscale sedge	Cyperaceae	native	–	X	
<i>Carex feta</i>	greensheath sedge	Cyperaceae	native	–	X	



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Scientific Name	Common Name	Family	Native/ Non-Native Species	Status <sup>1</sup>	Terrestrial Surveys	Aquatic/ Riparian Surveys
<i>Carex fraxea</i>	fragile sheath sedge	Cyperaceae	native	–	X	
<i>Carex hoodii</i>	Hood's sedge	Cyperaceae	native	–	X	
<i>Carex jonesii</i>	Jones' sedge	Cyperaceae	native	–	X	
<i>Carex lenticularis</i> var. <i>lipocarpa</i>	Kellogg sedge	Cyperaceae	native	–	X	X
<i>Carex leporinella</i>	Sierra hare sedge	Cyperaceae	native	–		X
<i>Carex microptera</i>	smallwing sedge	Cyperaceae	native	–	X	
<i>Carex multicaulis</i>	manysystem sedge	Cyperaceae	native	–	X	
<i>Carex multicaulis</i>	manyrib sedge	Cyperaceae	native	–	X	
<i>Carex nebrascensis</i>	Nebraska sedge	Cyperaceae	native	–	X	
<i>Carex nudata</i>	torrent sedge	Cyperaceae	native	–	X	X
<i>Carex preslii</i>	Presl's sedge	Cyperaceae	native	–	X	X
<i>Carex raynoldsii</i>	Raynolds' sedge	Cyperaceae	native	–	X	
<i>Carex speciosa</i>	narrowfruit sedge	Cyperaceae	native	–	X	
<i>Carex utriculata</i>	beaked sedge	Cyperaceae	native	–		X
<i>Carex vesicaria</i> var. <i>vesicaria</i>	inflated sedge, blister sedge	Cyperaceae	native	–	X	X
<i>Castilleja applegatei</i>	wavyleaf paintbrush	Scrophulariaceae	native	–	X	
<i>Castilleja miniata</i> ssp. <i>miniata</i>	green paintbrush, scarlet paintbrush	Scrophulariaceae	native	–	X	
<i>Castilleja pruinosa</i>	frosted Indian paintbrush	Scrophulariaceae	native	–	X	
<i>Castilleja tenuis</i>	Hairy owl's clover	Scrophulariaceae	native	–	X	
<i>Ceanothus cordulatus</i>	whitethorn ceanothus	Rhamnaceae	native	–	X	X
<i>Ceanothus cuneatus</i>	buckbrush	Rhamnaceae	native	–	X	
<i>Ceanothus integerrimus</i>	deerbrush	Rhamnaceae	native	–	X	X
<i>Ceanothus prostratus</i>	squawcarpet	Rhamnaceae	native	–	X	
<i>Centaurea melitensis</i>	lotalote	Asteraceae	non-native	–	X	
<i>Centaurea solstitialis</i>	yellow star thistle	Asteraceae	non-native	–	X	X
<i>Centaurium muehlenbergii</i>	Muhlenberg's centaury	Gentianaceae	native	–	X	
<i>Centaurium venustum</i>	canchalagua	Gentianaceae	native	–	X	X
<i>Cephalanthus occidentalis</i> var. <i>californicus</i>	California buttonwillow, common buttonbush	Rubiaceae	native	–	X	X
<i>Ceratodon purpureus</i>	ceratodon moss	Ditrichaceae	native	–	X	
<i>Chamaebatia foliolosa</i>	Sierran mountain misery	Rosaceae	native	–	X	X
<i>Chamaesyce maculata</i>	spotted spurge	Euphorbiaceae	non-native	–	X	X
<i>Chamaesyce nutans</i>	eyebane	Euphorbiaceae	non-native	–	X	X
<i>Chamaesyce serpyllifolia</i> ssp. <i>hirtula</i>	hairy thyme leafed spurge, thymeleaf sandmat	Euphorbiaceae	native	–	X	
<i>Chamaesyce serpyllifolia</i> ssp. <i>serpyllifolia</i>	thymeleaf sandmat	Euphorbiaceae	native	–	X	X
<i>Chamomilla suaveolens</i>	pineapple weed	Asteraceae	non-native	–	X	
<i>Cheilanthes gracillima</i>	lace lipfern	Pteridaceae	native	–	X	

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Scientific Name	Common Name	Family	Native/ Non-Native Species	Status <sup>1</sup>	Terrestrial Surveys	Aquatic/ Riparian Surveys
<i>Chenopodium ambrosioides</i>	Mexican tea	Chenopodiaceae	non-native	–	X	X
<i>Chenopodium botrys</i>	Jerusalem oak goosefoot	Chenopodiaceae	non-native	–	X	X
<i>Chenopodium pumilio</i>	clammy goosefoot	Chenopodiaceae	non-native	–	X	
<i>Chiloscyphus polyanthos</i>	liverwort	Geocalycaceae	native	–		X
<i>Chimaphila menziesii</i>	little prince's pine	Ericaceae	native	–	X	
<i>Chimaphila umbellata</i>	pipsissewa	Ericaceae	native	–	X	X
<i>Chlorogalum pomeridianum</i>	soaproot	Liliaceae	native	–	X	
<i>Chondrilla juncea</i>	rush skeletonweed , hogbite	Asteraceae	non-native	–	X	X
<i>Chrysolepis sempervirens</i>	Bush chinquapin, Sierra chinquapin	Fagaceae	native	–	X	X
<i>Chrysomelidus nauseosus ssp. hololeucus</i>	rubber rabbitbrush	Asteraceae	native	–	X	
<i>Cicuta douglasii</i>	Western water hemlock	Apiaceae	native	–	X	
<i>Cinna latifolia</i>	wood reedgrass	Poaceae	native	–	X	X
<i>Circaea alpina ssp. pacifica</i>	enchanter's nightshade	Onagraceae	native	–	X	X
<i>Cirsium andersonii</i>	rose thistle	Asteraceae	native	–	X	X
<i>Cirsium arvense</i>	Canada thistle	Asteraceae	non-native	–	X	
<i>Cirsium occidentale var. californicum</i>	California thistle	Asteraceae	native	–	X	
<i>Cirsium vulgare</i>	bullthistle	Asteraceae	non-native	–	X	X
<i>Clarkia biloba ssp. biloba</i>	two-lobed fairyfan	Onagraceae	native	–	X	
<i>Clarkia gracilis ssp. gracilis</i>	slender fairyfan	Onagraceae	native	–	X	
<i>Clarkia purpurea ssp. quadrivulnera</i>	winecup fairyfan	Onagraceae	native	–	X	
<i>Claytonia parviflora ssp. parviflora</i>	narrowleaf miner's lettuce	Portulacaceae	native	–	X	
<i>Claytonia perfoliata</i>	miner's lettuce	Portulacaceae	native	–	X	
<i>Claytonia rubra ssp. rubra</i>	red-stemmed miner's lettuce	Portulacaceae	native	–	X	
<i>Clematis lasiantha</i>	chaparral virgin's bower	Ranunculaceae	native	–		X
<i>Clintonia uniflora</i>	bride's bonnet	Liliaceae	native	–	X	X
<i>Codiophorus depressus</i>	moss	Grimmiaceae	native	–		X
<i>Codiophorus norrisii</i>	moss	Grimmiaceae	native	–		X
<i>Codiophorus varius</i>	moss	Grimmiaceae	native	–		X
<i>Collinsia bartsiiifolia var. davidsonii</i>	Davidson's blue eyed Mary	Scrophulariaceae	native	–	X	
<i>Collinsia heterophylla</i>	Chinese houses	Scrophulariaceae	native	–	X	
<i>Collinsia tinctoria</i>	tinctureplant	Scrophulariaceae	native	–	X	
<i>Collinsia torreyi var. wrightii</i>	Wright's blue eyed Mary	Scrophulariaceae	native	–	X	
<i>Collomia heterophylla</i>	variableleaf mountain trumpet	Polemoniaceae	native	–	X	
<i>Collomia linearis</i>	narrowleaf mountain trumpet	Polemoniaceae	native	–	X	
<i>Conyza canadensis</i>	Canadian horseweed	Asteraceae	native	–	X	X
<i>Corallorrhiza maculata</i>	summer coralroot	Orchidaceae	native	–	X	

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Scientific Name	Common Name	Family	Native/ Non-Native Species	Status <sup>1</sup>	Terrestrial Surveys	Aquatic/ Riparian Surveys
<i>Cordylanthus tenuis ssp. tenuis</i>	slender bird's beak	Scrophulariaceae	native	–	X	
<i>Cornus glabrata</i>	brown dogwood	Cornaceae	native	–		X
<i>Cornus nuttallii</i>	Pacific dogwood	Cornaceae	native	–	X	X
<i>Cornus sericea</i>	redosier dogwood	Cornaceae	native	–	X	
<i>Cornus sericea ssp. occidentalis</i>	American dogwood	Cornaceae	native	–	X	
<i>Cornus sericea ssp. sericea</i>	redosier dogwood, American dogwood	Cornaceae	native	–		X
<i>Cornus sessilis</i>	blackfruit dogwood	Cornaceae	native	–		X
<i>Corylus cornuta var. californica</i>	hazelnut	Betulaceae	native	–	X	X
<i>Cryptantha affinis</i>	quill catseye	Boraginaceae	native	–	X	
<i>Cryptantha simulans</i>	pinewoods catseye	Boraginaceae	native	–	X	
<i>Cryptogramma acrostichoides</i>	American rockbrake	Pteridaceae	native	–	X	
<i>Cuscuta californica var. californica</i>	California dodder	Cuscutaceae	native	–	X	
<i>Cynodon dactylon</i>	Bermuda grass	Poaceae	non-native	–		X
<i>Cynosurus echinatus</i>	hedgehog dogtailgrass	Poaceae	non-native	–	X	X
<i>Cyperus acuminatus</i>	tapertip flatsedge	Cyperaceae	native	–		
<i>Cyperus eragrostis</i>	tall flatsedge	Cyperaceae	native	–	X	X
<i>Cyperus erythrorhizos</i>	red rooted flatsedge	Cyperaceae	native	–		X
<i>Cyperus squarrosus</i>	bearded flatsedge	Cyperaceae	native	–	X	X
<i>Cyperus strigosus</i>	false nutsedge	Cyperaceae	native	–		X
<i>Cystopteris fragilis</i>	brittle bladderfern	Dryopteridaceae	native	–	X	X
<i>Cytisus scoparius</i>	scotch broom	Fabaceae	non-native	–		X
<i>Dactylis glomerata</i>	orchardgrass	Poaceae	non-native	–	X	X
<i>Danthonia californica var. americana</i>	California oatgrass	Poaceae	native	–	X	
<i>Darmera peltata</i>	umbrella plant	Saxifragaceae	native	–	X	X
<i>Datisca glomerata</i>	Durango root	Datisceae	native	–	X	X
<i>Daucus carota</i>	carrot	Apiaceae	non-native	–	X	
<i>Daucus pusillus</i>	American wild carrot	Apiaceae	native	–	X	
<i>Delphinium glaucum</i>	Sierra larkspur	Ranunculaceae	native	–	X	
<i>Delphinium gracilentum</i>	pine forest larkspur	Ranunculaceae	native	–	X	
<i>Delphinium nuttallianum</i>	meadow larkspur	Ranunculaceae	native	–	X	
<i>Delphinium polycladon</i>	mountain marsh larkspur	Ranunculaceae	native	–	X	
<i>Dendroalsia abietina</i>	dendroalsia moss	Leucodontaceae	native	–		X
<i>Deschampsia elongata</i>	slender hairgrass	Poaceae	native	–	X	
<i>Descurainia incana</i>	mountain tansymustard	Brassicaceae	native	–	X	
<i>Dicentra formosa</i>	Pacific bleedingheart	Papaveraceae	native	–	X	X
<i>Dichelostemma capitatum</i>	blue dicks	Liliaceae	native	–	X	X



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<i>Dichelostemma multiflorum</i>	wild hyacinth	Liliaceae	native	–	X	
<i>Dichelostemma volubile</i>	twining snake lily	Liliaceae	native	–		X
<i>Dichodontium pellucidum</i>	dichodontium moss	Dicranaceae	native	–		X
<i>Didymodon vinealis</i>	didymodon moss	Pottiaceae	native	–	X	X
<i>Digitaria sanguinalis</i>	hairy crabgrass	Poaceae	non-native	–		X
<i>Disporum hookeri</i>	drops of gold	Liliaceae	native	–	X	X
<i>Draba verna</i>	spring draba	Brassicaceae	native	–	X	
<i>Draperia systyla</i>	violet draperia	Hydrophyllaceae	native	–	X	
<i>Dryopteris arguta</i>	wood fern	Dryopteridaceae	native	–	X	X
<i>Dudleya cymosa</i>	canyon liveforever	Crassulaceae	native	–	X	
<i>Echinochloa colona</i>	jungle rice	Poaceae	non-native	–		X
<i>Echinochloa crus galli</i>	barnyard grass	Poaceae	non-native	–		X
<i>Eleocharis acicularis</i> var. <i>bella</i>	beautiful spikerush	Cyperaceae	native	–	X	
<i>Eleocharis pachycarpa</i>	black sand spike rush	Cyperaceae	non-native	–		X
<i>Eleocharis pauciflora</i>	few-flowered spike rush	Cyperaceae	native	–		X
<i>Elymus elymoides</i> ssp. <i>elymoides</i>	squirreltail	Poaceae	native	–	X	
<i>Elymus glaucus</i> ssp. <i>glaucus</i>	blue wildrye	Poaceae	native	–	X	X
<i>Elymus glaucus</i> ssp. <i>virescens</i>	Virginia wildrye	Poaceae	native	–	X	
<i>Elymus multisetus</i>	big squirreltail	Poaceae	native	–	X	X
<i>Elymus trachycaulus</i>	slender wheatgrass	Poaceae	native	–	X	X
<i>Elytrigia elongata</i>	tall wheatgrass	Poaceae	non-native	–	X	
<i>Elytrigia intermedia</i> ssp. <i>intermedia</i>	intermediate wheatgrass	Poaceae	non-native	–	X	
<i>Epilobium angustifolium</i> ssp. <i>circumvagum</i>	fireweed	Onagraceae	native	–	X	X
<i>Epilobium brachycarpum</i>	autumn willowweed	Onagraceae	native	–	X	
<i>Epilobium canum</i>	California fuchsia, zauschneria	Onagraceae	native	–	X	
<i>Epilobium canum</i> ssp. <i>latifolium</i>	California Fuchsia	Onagraceae	native	–	X	X
<i>Epilobium ciliatum</i>	hairy willow herb	Onagraceae	native	–	X	X
<i>Epilobium ciliatum</i> ssp. <i>ciliatum</i>	willow-herb	Onagraceae	native	–	X	
<i>Epilobium ciliatum</i> ssp. <i>glandulosum</i>	glandular willowweed	Onagraceae	native	–	X	
<i>Epilobium densiflorum</i>	denseflower spike primrose, dense boisduvalia	Onagraceae	native	–	X	X
<i>Epilobium foliosum</i>	California willowherb	Onagraceae	native	–	X	
<i>Epilobium minutum</i>	small willowweed	Onagraceae	native	–	X	
<i>Epilobium pallidum</i>	largeflower spike primrose	Onagraceae	native	–	X	
<i>Epipactis gigantea</i>	giant helleborine	Orchidaceae	native	–	X	X
<i>Equisetum arvense</i>	field horsetail	Equisetaceae	native	–	X	X
<i>Equisetum hyemale</i>	scouring horsetail	Equisetaceae	native	–	X	



## Appendix C. Terrestrial, Aquatic, and Riparian Plants and Mosses Identified in the Study Area.

Scientific Name	Common Name	Family	Native/ Non-Native Species	Status <sup>1</sup>	Terrestrial Surveys	Aquatic/ Riparian Surveys
<i>Equisetum hyemale</i> ssp. <i>affine</i>	common scouring rush	Equisetaceae	native	–	X	X
<i>Equisetum laevigatum</i>	smooth scouring rush	Equisetaceae	native	–	X	X
<i>Eremocarpus setigerus</i>	turkey mullein	Euphorbiaceae	native	–	X	X
<i>Erigeron coulteri</i>	large mountain fleabane	Asteraceae	native	–	X	
<i>Erigeron foliosus</i> var. <i>foliosus</i>	leafy fleabane	Asteraceae	native	–	X	
<i>Erigeron inornatus</i> var. <i>inornatus</i>	fleabane daisy	Asteraceae	native	–		X
<i>Eriodictyon californicum</i>	California yerbasanta	Hydrophyllaceae	native	–	X	
<i>Eriogonum gracile</i>	slender wooly buckwheat	Polygonaceae	native	–		X
<i>Eriogonum luteolum</i> var. <i>luteolum</i>	wickerstem buckwheat	Polygonaceae	native	–	X	
<i>Eriogonum marifolium</i>	marumleaf buckwheat	Polygonaceae	native	–	X	
<i>Eriogonum nudum</i>	naked buckwheat	Polygonaceae	native	–	X	X
<i>Eriogonum nudum</i> var. <i>deductum</i>	naked buckwheat	Polygonaceae	native	–	X	
<i>Eriogonum nudum</i> var. <i>nudum</i>	naked buckwheat	Polygonaceae	native	–	X	
<i>Eriogonum nudum</i> var. <i>pubiflorum</i>	naked buckwheat	Polygonaceae	native	–	X	
<i>Eriogonum roseum</i>	wand buckwheat	Polygonaceae	native	–	X	
<i>Eriogonum umbellatum</i> var. <i>nevadense</i>	Nevada buckwheat, sulphur flower buckwheat	Polygonaceae	native	–	X	
<i>Eriogonum ursinum</i>	Bear Valley buckwheat	Polygonaceae	native	–	X	
<i>Eriogonum wrightii</i>	Wright's buckwheat	Polygonaceae	native	–	X	
<i>Eriophyllum lanatum</i> var. <i>achillaeoides</i>	woolly sunflower	Asteraceae	native	–	X	X
<i>Erodium cicutarium</i>	redstem filaree	Geraniaceae	non-native	–	X	
<i>Erysimum capitatum</i> ssp. <i>capitatum</i>	western wallflower	Brassicaceae	native	–	X	
<i>Erythronium multiscapoideum</i>	Sierra fawnlily	Liliaceae	native	–	X	
<i>Erythronium purpurascens</i>	purple fawnlily	Liliaceae	native	–	X	
<i>Euthamia occidentalis</i>	western goldenrod	Asteraceae	native	–		X
<i>Ficus carica</i>	common fig	Moraceae	non-native	–	X	X
<i>Filago gallica</i>	narrow-leaved filago	Asteraceae	non-native	–	X	
<i>Fontinalis antipyretica</i>	antifever fontinalis moss	Fontinalaceae	native	–		X
<i>Fragaria vesca</i>	California strawberry	Rosaceae	native	–	X	
<i>Fragaria virginiana</i>	mountain strawberry	Rosaceae	native	–	X	X
<i>Fraxinus dipetala</i>	two petal ash	Oleaceae	native	–	X	X
<i>Fritillaria recurva</i>	scarlet missionbells	Liliaceae	native	–	X	
<i>Galium aparine</i>	common bedstraw	Rubiaceae	native	–	X	X
<i>Galium bifolium</i>	twinleaf bedstraw	Rubiaceae	native	–	X	
<i>Galium bolanderi</i>	Bolander's bedstraw	Rubiaceae	native	–	X	X
<i>Galium grayanum</i>	Gray's bedstraw	Rubiaceae	native	–		X
<i>Galium murale</i>	tiny bedstraw	Rubiaceae	non-native	–	X	

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Scientific Name	Common Name	Family	Native/ Non-Native Species	Status <sup>1</sup>	Terrestrial Surveys	Aquatic/ Riparian Surveys
<i>Galium parisiense</i>	wall bedstraw	Rubiaceae	non-native	–	X	
<i>Galium porrigens</i> var. <i>porrigens</i>	graceful bedstraw	Rubiaceae	native	–	X	
<i>Galium porrigens</i> var. <i>tenue</i>	graceful bedstraw	Rubiaceae	native	–	X	
<i>Galium tricornutum</i>	rough bedstraw	Rubiaceae	native	–		X
<i>Galium trifidum</i> var. <i>pacificum</i>	threepetal bedstraw	Rubiaceae	native	–	X	X
<i>Galium triflorum</i>	fragrant bedstraw	Rubiaceae	native	–	X	X
<i>Garrya fremontii</i>	Fremont silktassel	Garryaceae	native	–	X	X
<i>Gastridium ventricosum</i>	nit grass	Poaceae	non-native	–	X	X
<i>Gaultheria ovatifolia</i>	western teaberry/wintergreen	Ericaceae	native	–		X
<i>Gayophytum diffusum</i>	spreading ground smoke	Onagraceae	native	–	X	X
<i>Gayophytum diffusum</i> ssp. <i>parviflorum</i>	spreading groundsmoke	Onagraceae	native	–	X	
<i>Gayophytum eriospermum</i>	Coville's gayophytum, Woolly Seeded Groundsmoke,	Onagraceae	native	–	X	X
<i>Gayophytum heterozygum</i>	zigzag groundsmoke	Onagraceae	native	–	X	X
<i>Gayophytum humile</i>	dwarf groundsmoke	Onagraceae	native	–	X	
<i>Geranium pusillum</i>	small geranium	Geraniaceae	non-native	–	X	
<i>Geum macrophyllum</i>	largeleaf avens	Rosaceae	native	–	X	
<i>Gilia capillaris</i>	miniature gilia	Polemoniaceae	native	–	X	
<i>Gilia capitata</i>	bluehead gilia	Polemoniaceae	native	–	X	
<i>Gilia leptalea</i>	Bridge's gilia	Polemoniaceae	native	–	X	X
<i>Gilia leptalea</i> ssp. <i>bicolor</i>	purple-throat gilia	Polemoniaceae	native	–	X	
<i>Gilia tricolor</i>	bird's eye gilia	Polemoniaceae	native	–	X	X
<i>Glyceria elata</i>	Fowl mannagrass, tall mannagrass	Poaceae	native	–	X	X
<i>Gnaphalium californicum</i>	ladies' tobacco	Asteraceae	native	–	X	
<i>Gnaphalium canescens</i>	wooly everlasting cudweed	Asteraceae	native	–	X	X
<i>Gnaphalium canescens</i> ssp. <i>beneolens</i>	everlasting cudweed	Asteraceae	native	–	X	
<i>Gnaphalium canescens</i> ssp. <i>thermale</i>	small-headed cudweed	Asteraceae	native	–	X	
<i>Gnaphalium luteo-album</i>	everlasting cudweed	Asteraceae	non-native	–	X	X
<i>Gnaphalium palustre</i>	western marsh cudweed	Asteraceae	native	–	X	X
<i>Gnaphalium purpureum</i>	spoonleaf purple everlasting	Asteraceae	native	–	X	
<i>Goodyera oblongifolia</i>	rattlesnake plantain	Orchidaceae	native	–	X	
<i>Grimmia lisae</i>	moss	Grimmiaceae	native	–		X
<i>Grimmia longirostris</i>	moss	Grimmiaceae	native	–	X	
<i>Grimmia montana</i>	montane dry rock moss	Grimmiaceae	native	–	X	X
<i>Grimmia trichophylla</i>	grimmia dry rock moss	Grimmiaceae	native	–	X	X
<i>Grindelia camporum</i> var. <i>camporum</i>	Great Valley gumweed	Asteraceae	native	–	X	X
<i>Grindelia hirsutula</i> var. <i>davyi</i>	hairy gumweed	Asteraceae	native	–		X



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Scientific Name	Common Name	Family	Native/ Non-Native Species	Status <sup>1</sup>	Terrestrial Surveys	Aquatic/ Riparian Surveys
<i>Hackelia floribunda</i>	manyflower stickseed	Boraginaceae	native	–	X	
<i>Hackelia mundula</i>	pink stickseed	Boraginaceae	native	–	X	
<i>Hackelia velutina</i>	velvet stickseed	Boraginaceae	native	–	X	
<i>Helenium bigelovii</i>	sneezeweed	Asteraceae	native	–		X
<i>Helianthella californica</i> var. <i>nevadensis</i>	Sierra helianthella	Asteraceae	native	–	X	
<i>Heracleum lanatum</i>	common cowparsnip, cow parsnip	Apiaceae	native	–	X	
<i>Hesperostipa comata</i> ssp. <i>intermedia</i>	intermediate needle and thread	Poaceae	native	–	X	
<i>Heteromeles arbutifolia</i>	toyon	Rosaceae	native	–	X	X
<i>Heterotheca oregona</i>	Oregon false goldenaster	Asteraceae	native	–		X
<i>Heterotheca oregona</i> var. <i>compacta</i>	Oregon false goldenaster	Asteraceae	native	–		X
<i>Heuchera micrantha</i>	crevice alumroot	Saxifragaceae	native	–	X	X
<i>Heuchera rubescens</i>	pink alumroot	Saxifragaceae	native	–	X	
<i>Hieracium albiflorum</i>	white hawkweed	Asteraceae	native	–	X	X
<i>Hieracium argutum</i>	southern hawkweed	Asteraceae	native	–	X	
<i>Hirschfeldia incana</i>	shortpod mustard, summer mustard	Brassicaceae	non-native	–	X	X
<i>Holcus lanatus</i>	common velvetgrass	Poaceae	non-native	–	X	
<i>Holodiscus discolor</i>	oceanspray	Rosaceae	native	–	X	
<i>Holozonia filipes</i>	whitecrown	Asteraceae	native	–		X
<i>Homalothecium nevadense</i>	Nevada homalothecium moss	Brachytheciaceae	native	–		X
<i>Homalothecium pinnatifidum</i>	pinnatifid homalothecium moss	Brachytheciaceae	native	–	X	X
<i>Hordeum brachyantherum</i> ssp. <i>californicum</i>	meadow barley, California barley	Poaceae	native	–	X	
<i>Hordeum jubatum</i>	squirreltail foxtail barley	Poaceae	native	–		X
<i>Hordeum marinum</i> ssp. <i>gussoneanum</i>	Mediterranean barley	Poaceae	non-native	–	X	
<i>Hordeum murinum</i>	foxtail barley	Poaceae	non-native	–	X	X
<i>Horkelia fusca</i>	tawny horkelia	Rosaceae	native	–	X	
<i>Horkelia tridentata</i> ssp. <i>flavescens</i>	three toothed horkelia	Rosaceae	native	–	X	
<i>Horkelia tridentata</i> ssp. <i>tridentata</i>	threetooth honeydew	Rosaceae	native	–	X	
<i>Hydrophyllum occidentale</i>	western waterleaf	Hydrophyllaceae	native	–	X	
<i>Hypericum anagalloides</i>	tinker's penny	Hypericaceae	native	–	X	X
<i>Hypericum concinnum</i>	gold-wire	Hypericaceae	native	–	X	
<i>Hypericum formosum</i> var. <i>scouleri</i>	Scouler's St. Johnswort	Hypericaceae	native	–	X	X
<i>Hypericum perforatum</i>	klamathweed	Hypericaceae	non-native	–	X	X
<i>Hypnum subimponens</i>	hypnum moss	Hypnaceae	native	–		X
<i>Hypochaeris glabra</i>	smooth cat's ear	Asteraceae	non-native	–	X	
<i>Iris hartwegii</i> ssp. <i>pinetorum</i>	rainbow iris, Hartweg's yellow pine iris	Iridaceae	native	–	X	
<i>Isoetecium stoloniferum</i>	isothecium moss	Brachytheciaceae	native	–		X

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Scientific Name	Common Name	Family	Native/ Non-Native Species	Status <sup>1</sup>	Terrestrial Surveys	Aquatic/ Riparian Surveys
<i>Juncus acuminatus</i>	tapertip rush	Juncaceae	native	–	X	
<i>Juncus ballicus</i>	Ballic rush, toad rush	Juncaceae	native	–	X	X
<i>Juncus bufonius</i> var. <i>bufonius</i>	toad rush	Juncaceae	native	–	X	
<i>Juncus bufonius</i> var. <i>occidentalis</i>	toad rush	Juncaceae	native	–	X	
<i>Juncus chlorocephalus</i>	greenhead rush	Juncaceae	native	–	X	X
<i>Juncus confusus</i>	Colorado rush	Juncaceae	native	–		X
<i>Juncus effusus</i>	common bog rush	Juncaceae	native	–		X
<i>Juncus effusus</i> var. <i>exiguus</i>	lamp rush	Juncaceae	native	–	X	
<i>Juncus effusus</i> var. <i>gracilis</i>		Juncaceae	native	–	X	
<i>Juncus effusus</i> var. <i>pacificus</i>	Pacific rush	Juncaceae	native	–	X	
<i>Juncus ensifolius</i>	swordleaf rush	Juncaceae	native	–	X	X
<i>Juncus longistylis</i>	longstyle rush	Juncaceae	native	–	X	X
<i>Juncus mexicanus</i>	Mexican rush	Juncaceae	native	–	X	
<i>Juncus nevadensis</i>	Nevada rush	Juncaceae	native	–	X	X
<i>Juncus occidentalis</i>	western rush	Juncaceae	native	–	X	
<i>Juncus patens</i>	common rush	Juncaceae	native	–	X	
<i>Juncus phaeocephalus</i> var. <i>paniculatus</i>	brown headed rush	Juncaceae	native	–		X
<i>Juniperus occidentalis</i> var. <i>australis</i>	southwestern juniper	Cupressaceae	native	–	X	
<i>Keckiella breviflora</i>	gaping beardtongue	Scrophulariaceae	native	–	X	X
<i>Keckiella breviflora</i> var. <i>breviflora</i>	bush beardtongue	Scrophulariaceae	native	–	X	
<i>Kelloggia galioides</i>	milk kelloggia	Rubiaceae	native	–	X	
<i>Kindbergia praelonga</i>	eurhynchium moss	Brachytheciaceae	native	–		X
<i>Lactuca serriola</i>	wild lettuce	Asteraceae	non-native	–	X	X
<i>Lathyrus brownii</i>	Brown's pea	Fabaceae	native	–	X	
<i>Lathyrus jepsonii</i>	tule pea	Fabaceae	native	–		X
<i>Lathyrus lanszwertii</i> var. <i>aridus</i>	dryland Nevada pea, Nevada pea	Fabaceae	native	–	X	
<i>Lathyrus nevadensis</i> var. <i>nevadensis</i>	Sierra Nevada pea	Fabaceae	native	–	X	X
<i>Lathyrus sulphureus</i>	snub peavine	Fabaceae	native	–	X	
<i>Leersia oryzoides</i>	rice cutgrass	Poaceae	native	–		X
<i>Lepidium latifolium</i>	broadleaved pepperweed	Brassicaceae	non-native	–	X	
<i>Leptodactylon pungens</i>	granite pricklygilia	Polemoniaceae	native	–	X	
<i>Lessingia leptoclada</i>	Sierra vinegarweed	Asteraceae	native	–	X	X
<i>Leucothoe davisiae</i>	Sierra laurel	Ericaceae	native	–	X	X
<i>Lewisia nevadensis</i>	Nevada bitterroot	Portulacaceae	native	–	X	
<i>Lewisia triphylla</i>	threeleaf lewisia	Portulacaceae	native	–	X	
<i>Leymus triticoides</i>	beardless wildrye	Poaceae	native	–	X	



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<i>Ligusticum grayi</i>	Gray's licoriceroot	Apiaceae	native	—	X	
<i>Lilium pardalinum</i>	Leopard lily	Liliaceae	native	—		X
<i>Lilium parvum</i>	Sierra tiger lily	Liliaceae	native	—	X	X
<i>Lilium washingtonianum</i>	Washington lily	Liliaceae	native	—	X	
<i>Linanthus bicolor</i>	true babystars	Polemoniaceae	native	—	X	
<i>Linanthus ciliatus</i>	whiskerbrush	Polemoniaceae	native	—	X	
<i>Linanthus harknessii</i>	Harkness' flaxflower	Polemoniaceae	native	—	X	
<i>Linanthus parviflorus</i>	false babystars	Polemoniaceae	native	—	X	
<i>Lithophragma parviflorum</i> var. <i>parviflorum</i>	smallflower woodlandstar	Saxifragaceae	native	—	X	
<i>Lolium multiflorum</i>	Italian ryegrass	Poaceae	non-native	—	X	X
<i>Lomatium dissectum</i> var. <i>dissectum</i>	fernleaf biscuitroot	Apiaceae	native	—	X	
<i>Lomatium dissectum</i> var. <i>multifidum</i>	carrotleaf biscuitroot	Apiaceae	native	—	X	
<i>Lomatium torreyi</i>	Sierran biscuitroot	Apiaceae	native	—	X	
<i>Lonicera confugialis</i>	purpleflower honeysuckle	Caprifoliaceae	native	—	X	
<i>Lonicera involucrata</i>	twinberry	Caprifoliaceae	native	—		X
<i>Lonicera subspicata</i> var. <i>denudata</i>	southern Honeysuckle, Johnston's honeysuckle	Caprifoliaceae	native	—	X	
<i>Lotus argophyllus</i> var. <i>argophyllus</i>	silver birdsfoot trefoil	Fabaceae	native	—	X	
<i>Lotus argophyllus</i> var. <i>fremontii</i>	Fremont's silver lotus, Fremont's birdsfoot trefoil	Fabaceae	native	—	X	
<i>Lotus corniculatus</i>	birdsfoot trefoil	Fabaceae	non-native	—	X	X
<i>Lotus crassifolius</i>	big deervetch	Fabaceae	native	—	X	
<i>Lotus grandiflorus</i> var. <i>grandiflorus</i>	chaparral lotus	Fabaceae	native	—	X	
<i>Lotus incanus</i>	woolly trefoil	Fabaceae	native	—	X	
<i>Lotus micranthus</i>	desert deervetch	Fabaceae	native	—	X	X
<i>Lotus nevadensis</i>	Sierra Nevada lotus	Fabaceae	native	—	X	X
<i>Lotus nevadensis</i> var. <i>nevadensis</i>	Nevada trefoil	Fabaceae	native	—	X	
<i>Lotus oblongifolius</i>	streambank trefoil	Fabaceae	native	—	X	
<i>Lotus oblongifolius</i> var. <i>oblongifolius</i>	streambank trefoil	Fabaceae	native	—	X	X
<i>Lotus purshianus</i> var. <i>purshianus</i>	Spanish clover	Fabaceae	native	—	X	X
<i>Lupinus adsurgens</i>	Drew's silky lupine	Fabaceae	native	—	X	
<i>Lupinus albifrons</i>	silver bush lupine	Fabaceae	native	—	X	
<i>Lupinus bicolor</i>	bicolor lupine	Fabaceae	native	—	X	
<i>Lupinus bicolor</i>	bicolor lupine	Fabaceae	native	—	X	
<i>Lupinus grayii</i>	Gray's lupine	Fabaceae	native	—	X	
<i>Lupinus latifolius</i> var. <i>columbianus</i>	lupine	Fabaceae	native	—	X	X
<i>Lupinus lepidus</i> var. <i>sellulus</i>	dwarf lupine	Fabaceae	native	—	X	
<i>Lupinus nanus</i>	sky lupine	Fabaceae	native	—	X	

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<i>Lupinus polyphyllus</i>	meadow lupine	Fabaceae	native	–	X	
<i>Lupinus stiversii</i>	harlequin annual lupine	Fabaceae	native	–	X	
<i>Luzula comosa</i>	hairy woodrush, heath woodrush	Juncaceae	native	–	X	X
<i>Luzula subcongesta</i>	Donner woodrush	Juncaceae	native	–	X	
<i>Lycopus americanus</i>	American horehound	Lamiaceae	native	–		X
<i>Madia elegans</i> ssp. <i>elegans</i>	common madia	Asteraceae	native	–	X	
<i>Madia exigua</i>	threadstem tarweed	Asteraceae	native	–	X	
<i>Madia glomerata</i>	mountain tarweed	Asteraceae	native	–	X	
<i>Madia gracilis</i>	gumweed madia	Asteraceae	native	–		X
<i>Madia gracilis</i>	slender tarweed	Asteraceae	native	–	X	
<i>Madia minima</i>	little tarweed	Asteraceae	native	–	X	
<i>Madia sativa</i>	coast tarweed	Asteraceae	native	–	X	
<i>Madia subspicata</i>	slender tarweed	Asteraceae	native	–	X	
<i>Malus</i> sp.	apple	Rosaceae	non-native	–	X	
<i>Marah fabaceus</i>	California man-root	Cucurbitaceae	native	–	X	
<i>Marchantia polymorpha</i>	liverwort	Marchantiaceae	native	–	X	X
<i>Melica bulbosa</i>	oniongrass	Poaceae	native	–	X	
<i>Melica californica</i>	California melicgrass, California melic	Poaceae	native	–	X	
<i>Melica fugax</i>	little oniongrass	Poaceae	native	–	X	
<i>Melica harfordii</i>	Harford's oniongrass	Poaceae	native	–	X	
<i>Melica imperfecta</i>	smallflower melicgrass	Poaceae	native	–	X	X
<i>Melica torreyana</i>	Torrey's melic	Poaceae	native	–	X	X
<i>Melilotus alba</i>	white sweetclover	Fabaceae	non-native	–	X	
<i>Melilotus indica</i>	sourclover	Fabaceae	non-native	–	X	X
<i>Melilotus officinalis</i>	yellow sweetclover	Fabaceae	non-native	–	X	X
<i>Mentha arvensis</i>	wild mint	Lamiaceae	native	–	X	X
<i>Melaneckera menziesii</i>	Menzies' metaneckera moss	Neckeraceae	native	–		X
<i>Micropus californicus</i> var. <i>californicus</i>	slender cottonweed	Asteraceae	native	–	X	
<i>Microseris nutans</i>	nodding microceris	Asteraceae	native	–	X	
<i>Mimulus aurantiacus</i>	orange bush monkeyflower	Scrophulariaceae	native	–	X	X
<i>Mimulus breweri</i>	Brewer's monkeyflower	Scrophulariaceae	native	–	X	X
<i>Mimulus cardinalis</i>	crimson monkeyflower	Scrophulariaceae	native	–	X	X
<i>Mimulus floribundus</i>	manyflowered monkeyflower	Scrophulariaceae	native	–	X	X
<i>Mimulus guttatus</i>	seep monkeyflower	Scrophulariaceae	native	–	X	X
<i>Mimulus layneae</i>	Layne's monkeyflower	Scrophulariaceae	native	–	X	
<i>Mimulus leptaleus</i>	slender monkeyflower	Scrophulariaceae	native	–	X	



## Appendix C. Terrestrial, Aquatic, and Riparian Plants and Mosses Identified in the Study Area.

Scientific Name	Common Name	Family	Native/ Non-Native Species	Status <sup>1</sup>	Terrestrial Surveys	Aquatic/ Riparian Surveys
<i>Mimulus lewisii</i>	purple monkeyflower	Scrophulariaceae	native	–	X	X
<i>Mimulus mephiticus</i>	foul odor monkeyflower	Scrophulariaceae	native	–	X	X
<i>Mimulus moschatus</i>	musk monkeyflower	Scrophulariaceae	native	–	X	X
<i>Mimulus primuloides</i>	primrose monkeyflower	Scrophulariaceae	native	–	X	X
<i>Mimulus puniceus</i>	red bush monkeyflower	Scrophulariaceae	native	–		X
<i>Mimulus tilingii</i>	Tiling's monkeyflower	Scrophulariaceae	native	–	X	
<i>Mimulus torreyi</i>	Torrey's monkeyflower	Scrophulariaceae	native	–	X	X
<i>Monardella glauca</i>	pale monardella	Lamiaceae	native	–		X
<i>Monardella sheldonii</i>	Shelton's coyote mint, Shelton's mountainbalm	Lamiaceae	native	–	X	
<i>Montia parvifolia</i>	littleleaf montia	Portulacaceae	native	–	X	
<i>Muhlenbergia filiformis</i>	pullup muhly	Poaceae	native	–	X	X
<i>Muhlenbergia rigens</i>	deergrass	Poaceae	native	–	X	
<i>Myosotis laxa</i>	forget-me-not	Boraginaceae	native	–	X	X
<i>Nama lobbii</i>	Lobb's fiddleleaf	Hydrophyllaceae	native	–	X	
<i>Navaretia divaricata</i> ssp. <i>divaricata</i>	mountain navaretia	Polemoniaceae	native	–	X	
<i>Nemophila heterophylla</i>	small baby blue eyes	Hydrophyllaceae	native	–	X	
<i>Nemophila spatulata</i>	Sierra baby blue eyes	Hydrophyllaceae	native	–	X	
<i>Orobanche fasciculata</i>	clustered broomrape	Orobanchaceae	native	–	X	
<i>Orobanche uniflora</i>	oneflowered broomrape	Orobanchaceae	native	–	X	
<i>Orthodicranum tauricum</i>	moss	Dicranaceae	native	–	X	
<i>Orthotrichum lyellii</i>	Lyell's orthotrichum moss	Orthotrichaceae	native	–	X	
<i>Osmorhiza chilensis</i>	sweetcicely	Apiaceae	native	–	X	X
<i>Panicum acuminatum</i> var. <i>acuminatum</i>	western panicum	Poaceae	native	–	X	X
<i>Paspalum dilatatum</i>	dallis grass	Poaceae	non-native	–		X
<i>Paspalum distichum</i>	knot grass	Poaceae	native	–		X
<i>Pedicularis attollens</i>	attol lousewort	Scrophulariaceae	native	–	X	
<i>Pedicularis semibarbata</i>	bearded lousewort	Scrophulariaceae	native	–	X	
<i>Pellaea bridgesii</i>	Bridges' cliffbrake	Pteridaceae	native	–	X	
<i>Pellaea mucronata</i> var. <i>californica</i>	California cliffbrake	Pteridaceae	native	–	X	
<i>Pellaea mucronata</i> var. <i>mucronata</i>	bird's-foot fern	Pteridaceae	native	–	X	X
<i>Penstemon azureus</i>	azure penstemon	Scrophulariaceae	native	–	X	
<i>Penstemon deustus</i>	scabland penstemon	Scrophulariaceae	native	–	X	X
<i>Penstemon laetus</i> var. <i>leptosepalus</i>	wood penstemon	Scrophulariaceae	native	–	X	
<i>Penstemon newberryi</i>	mountainpride penstemon	Scrophulariaceae	native	–	X	
<i>Penstemon roezlii</i>	Regel's penstemon	Scrophulariaceae	native	–	X	
<i>Penstemon speciosus</i>	royal penstemon	Scrophulariaceae	native	–	X	

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Scientific Name	Common Name	Family	Native/ Non-Native Species	Status <sup>1</sup>	Terrestrial Surveys	Aquatic/ Riparian Surveys
<i>Pentagramma triangularis</i>	goldback fern	Pteridaceae	native	–	X	X
<i>Perideridia lemmonii</i>	Lemmon's yampah	Apiaceae	native	–	X	X
<i>Perideridia parishii</i> ssp. <i>latifolia</i>	Parish's yampah	Apiaceae	native	–	X	
<i>Petrorhagia dubia</i>	hairypink	Caryophyllaceae	non-native	–	X	X
<i>Phacelia hastata</i> ssp. <i>hastata</i>	mountain phacelia	Hydrophyllaceae	native	–	X	
<i>Phacelia hastata</i> var. <i>compacta</i>	compact phacelia	Hydrophyllaceae	native	–	X	X
<i>Phacelia heterophylla</i> ssp. <i>virgata</i>	varileaf phacelia	Hydrophyllaceae	native	–	X	
<i>Phacelia humilis</i>	low phacelia	Hydrophyllaceae	native	–		X
<i>Phacelia imbricata</i>	imbricate scorpionweed	Hydrophyllaceae	native	–	X	
<i>Phacelia marcescens</i>	persistentflower scorpionweed	Hydrophyllaceae	native	–	X	
<i>Phacelia mutabilis</i>	changeable scorpionweed	Hydrophyllaceae	native	–	X	
<i>Phacelia procera</i>	tall phacelia	Hydrophyllaceae	native	–		X
<i>Phacelia vallicola</i>	Mariposa phacelia	Hydrophyllaceae	native	–	X	
<i>Phalaris lemmoni</i>	Lemmon's canary grass	Poaceae	native	–		X
<i>Philadelphus lewisii</i>	Lewis' mockorange	Philadelphaceae	native	–	X	X
<i>Philonotis fontana</i>	philonotis moss	Bartramiaceae	native	–	X	
<i>Philonotis tomentella</i>	philonotis moss	Bartramiaceae	native	–		X
<i>Phleum pratense</i>	timothy	Poaceae	non-native	–	X	
<i>Phlox diffusa</i>	spreading phlox	Polemoniaceae	native	–	X	
<i>Phlox gracilis</i>	annual phlox	Polemoniaceae	native	–	X	
<i>Pholistoma auritum</i>	blue fiestaflower	Hydrophyllaceae	native	–	X	
<i>Pholistoma racemosum</i>	fiesta flower	Hydrophyllaceae	native	–	X	
<i>Phoradendron villosum</i>	Pacific mistletoe	Viscaceae	native	–	X	
<i>Pinus contorta</i>	lodgepole pine	Pinaceae	native	–	X	X
<i>Pinus jeffreyi</i>	Jeffrey pine	Pinaceae	native	–	X	X
<i>Pinus lambertiana</i>	sugar pine	Pinaceae	native	–	X	X
<i>Pinus ponderosa</i>	ponderosa pine	Pinaceae	native	–	X	X
<i>Pinus sabiniana</i>	foothill pine	Pinaceae	native	–	X	X
<i>Piptatherum miliaceum</i>	smilo grass	Poaceae	non-native	–	X	
<i>Plagiobothrys stipitatus</i> var. <i>micranthus</i>	common vernal pool allocarya, stalked popcornflower	Boraginaceae	native	–	X	
<i>Plagiomnium medium</i>	intermediate plagiomnium moss	Mniaceae	native	–	X	X
<i>Plantago erecta</i>	California plantain	Plantaginaceae	native	–	X	X
<i>Plantago lanceolata</i>	English plantain	Plantaginaceae	non-native	–	X	X
<i>Plantago major</i>	big plantain	Plantaginaceae	non-native	–	X	X
<i>Platanthera leucostachys</i>	white bog orchid, white flowered bog orchid	Orchidaceae	native	–	X	X
<i>Pleuricospora fimbriolata</i>	fringed pinesap	Ericaceae	native	–	X	



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<i>Poa annua</i>	annual bluegrass	Poaceae	non-native	–	X	
<i>Poa bulbosa</i>	bulbous bluegrass	Poaceae	non-native	–	X	
<i>Poa cusickii</i> ssp. <i>purpurascens</i>	skyline bluegrass	Poaceae	native	–	X	
<i>Poa secunda</i> ssp. <i>juncifolia</i>	western bluegrass, one-sided bluegrass	Poaceae	native	–	X	
<i>Poa secunda</i> ssp. <i>secunda</i>	one sided bluegrass	Poaceae	native	–	X	X
<i>Pohlia cruda</i>	pohlia moss	Bryaceae	native	–	X	X
<i>Pohlia wahlenbergii</i>	Wahlenberg's pohlia moss	Bryaceae	native	–		X
<i>Polygala cornuta</i>	Sierra milkwort	Polygalaceae	native	–	X	
<i>Polygala cornuta</i> var. <i>cornuta</i>	Sierra milkwort	Polygalaceae	native	–	X	X
<i>Polygonum arenastrum</i>	common knotweed	Polygonaceae	non-native	–	X	X
<i>Polygonum californicum</i>	California knotweed	Polygonaceae	native	–		X
<i>Polygonum douglasii</i>	Douglas' knotweed	Polygonaceae	native	–	X	X
<i>Polygonum douglasii</i> ssp. <i>douglasii</i>	Douglas' knotweed	Polygonaceae	native	–	X	
<i>Polygonum lapathifolium</i>	willow weed (curlytop knotweed)	Polygonaceae	native	–		X
<i>Polygonum minimum</i>	broadleaf knotweed	Polygonaceae	native	–	X	X
<i>Polygonum persicaria</i>	lady's thumb	Polygonaceae	non-native	–		X
<i>Polygonum phytolaccifolium</i>	poke knotweed	Polygonaceae	native	–	X	X
<i>Polygonum polygaloides</i> ssp. <i>confertiflorum</i>	dense knotweed	Polygonaceae	native	–	X	
<i>Polygonum polygaloides</i> ssp. <i>kelloggii</i>	Kellogg's knotweed	Polygonaceae	native	–	X	
<i>Polygonum punctatum</i>	water smartweed	Polygonaceae	native	–		X
<i>Polygonum punctatum</i>	punctate smartweed	Polygonaceae	native	–	X	
<i>Polypogon maritimus</i>	Mediterranean rabbitsfoot grass	Poaceae	non-native	–		X
<i>Polypogon monspeliensis</i>	annual beard grass	Poaceae	non-native	–	X	
<i>Polystichum imbricans</i>	cliff sword fern	Dryopteridaceae	native	–	X	
<i>Polystichum imbricans</i> ssp. <i>curtum</i>	cliff sword fern	Dryopteridaceae	native	–	X	
<i>Polystichum imbricans</i> ssp. <i>imbricans</i>	cliff sword fern, imbricate sword fern, naked sword fern	Dryopteridaceae	native	–	X	
<i>Polystichum kruckebergii</i>	Kruckeberg's sword fern	Dryopteridaceae	native	CNPS 4.3		X
<i>Polytrichastrum alpinum</i>	alpine polytrichastrum moss	Polytrichaceae	native	–		X
<i>Polytrichum juniperinum</i>	juniper polytrichum moss	Polytrichaceae	native	–	X	X
<i>Populus balsamifera</i> ssp. <i>trichocarpa</i>	black cottonwood	Salicaceae	native	–	X	X
<i>Populus fremontii</i> ssp. <i>fremontii</i>	Fremont's cottonwood	Salicaceae	native	–	X	X
<i>Populus tremuloides</i>	quaking aspen	Salicaceae	native	–	X	
<i>Potamogeton natans</i>	common pondweed	Potamogetonaceae	native	–		X
<i>Potentilla glandulosa</i>	gland cinquefoil	Rosaceae	native	–	X	X
<i>Potentilla glandulosa</i> ssp. <i>glandulosa</i>	sticky cinquefoil	Rosaceae	native	–	X	
<i>Potentilla glandulosa</i> ssp. <i>nevadensis</i>	Nevada cinquefoil	Rosaceae	native	–	X	

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Scientific Name	Common Name	Family	Native/ Non-Native Species	Status <sup>1</sup>	Terrestrial Surveys	Aquatic/ Riparian Surveys
<i>Potentilla gracilis</i> var. <i>flabelliformis</i>	cupformleaf cinquefoil	Rosaceae	native	–	X	
<i>Prunella vulgaris</i>	selfheal	Lamiaceae	native	–	X	X
<i>Prunus emarginata</i>	bitter cherry	Rosaceae	native	–	X	X
<i>Prunus virginiana</i> var. <i>demissa</i>	western chokecherry	Rosaceae	native	–	X	
<i>Pseudobraunia californica</i>	California pseudobraunia moss	Hedwigiaceae	native	–	X	
<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	Douglas-fir	Pinaceae	native	–	X	X
<i>Psilocarphus oregonus</i>	Oregon woolly heads	Asteraceae	native	–	X	
<i>Pteridium aquilinum</i> var. <i>pubescens</i>	bracken	Dennstaedtiaceae	native	–	X	X
<i>Pterospora andromedea</i>	woodland pinedrops	Ericaceae	native	–	X	X
<i>Pyrola picta</i>	whiteveined wintergreen	Ericaceae	native	–	X	X
<i>Quercus berberidifolia</i>	scrub oak	Fagaceae	native	–	X	X
<i>Quercus chrysolepis</i>	canyon live oak	Fagaceae	native	–	X	X
<i>Quercus kelloggii</i>	California black oak	Fagaceae	native	–	X	X
<i>Quercus vaccinifolia</i>	huckleberry oak	Fagaceae	native	–	X	X
<i>Ranunculus alismifolius</i> var. <i>alismellus</i>	Alisma-leaved buttercup	Ranunculaceae	native	–	X	
<i>Ranunculus californicus</i>	California buttercup	Ranunculaceae	native	–	X	
<i>Ranunculus flammula</i>	water buttercup	Ranunculaceae	native	–	X	
<i>Ranunculus occidentalis</i>	western buttercup	Ranunculaceae	native	–	X	
<i>Ranunculus repens</i>	creeping buttercup	Ranunculaceae	non-native	–	X	
<i>Rhamnus crocea</i>	redberry	Rhamnaceae	native	–	X	
<i>Rhamnus ilicifolia</i>	holly-leaf redberry	Rhamnaceae	native	–		X
<i>Rhamnus rubra</i>	Sierra coffeeberry	Rhamnaceae	native	–	X	X
<i>Rhamnus tomentella</i> ssp. <i>tomentella</i>	mountain coffeeberry	Rhamnaceae	native	–	X	X
<i>Rhododendron occidentale</i>	western azalea	Ericaceae	native	–	X	X
<i>Ribes amarum</i>	bitter gooseberry	Grossulariaceae	native	–	X	X
<i>Ribes cereum</i>	wax currant	Grossulariaceae	native	–	X	X
<i>Ribes nevadense</i>	Sierra currant	Grossulariaceae	native	–	X	X
<i>Ribes roezlii</i> var. <i>roezlii</i>	Roez's gooseberry	Grossulariaceae	native	–	X	
<i>Ribes velutinum</i>	desert gooseberry	Grossulariaceae	native	–	X	
<i>Robinia pseudoacacia</i>	black locust	Fabaceae	non-native	–	X	X
<i>Rorippa curvipes</i>	bluntleaf yellowcress	Brassicaceae	native	–		X
<i>Rorippa curvisiliqua</i>	curvepod yellowcress	Brassicaceae	native	–	X	X
<i>Rorippa palustris</i>	bog yellow cress	Brassicaceae	native	–		X
<i>Rosa californica</i>	California wild rose	Rosaceae	native	–		X
<i>Rosa woodsii</i> var. <i>ultramontana</i>	interior rose	Rosaceae	native	–	X	
<i>Rubus discolor</i>	Himalayan blackberry	Rosaceae	non-native	–	X	X



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<i>Rubus laciniatus</i>	cut-leaved blackberry	Rosaceae	non-native	–	X	X
<i>Rubus leucodermis</i>	whitebark raspberry	Rosaceae	native	–	X	X
<i>Rubus parviflorus</i>	thimbleberry	Rosaceae	native	–	X	X
<i>Rubus ursinus</i>	Pacific blackberry, California blackberry	Rosaceae	native	–	X	X
<i>Rudbeckia occidentalis</i> var. <i>occidentalis</i>	western coneflower	Asteraceae	native	–	X	
<i>Rumex acetosella</i>	common sheep sorrel	Polygonaceae	non-native	–	X	X
<i>Rumex crispus</i>	curly dock	Polygonaceae	non-native	–	X	X
<i>Rumex orbiculatus</i>	greater water dock	Polygonaceae	non-native	–	X	
<i>Rumex pulcher</i>	fiddle dock	Polygonaceae	non-native	–		X
<i>Sagina apetala</i>	dwarf pearlwort	Caryophyllaceae	native	–	X	X
<i>Sagittaria cuneata</i>	arum leaf arrowhead	Alismataceae	native	–		X
<i>Sagittaria latifolia</i>	broadleaf arrowhead	Alismataceae	native	–		X
<i>Salix eastwoodiae</i>	mountain willow	Salicaceae	native	–	X	X
<i>Salix exigua</i>	sandbar willow	Salicaceae	native	–		X
<i>Salix exigua</i> X <i>melanopsis</i>	hybrid willow	Salicaceae	native	–	X	X
<i>Salix jepsonii</i>	Jepson's willow	Salicaceae	native	–	X	X
<i>Salix laevigata</i>	red willow	Salicaceae	native	–	X	X
<i>Salix lasiolepis</i>	arroyo willow	Salicaceae	native	–	X	X
<i>Salix ligulifolia</i>	strapleaf willow	Salicaceae	native	–	X	X
<i>Salix lucida</i>	shining willow	Salicaceae	native	–	X	X
<i>Salix lutea</i>	yellow willow	Salicaceae	native	–	X	X
<i>Salix melanopsis</i>	dusky willow	Salicaceae	native	–	X	X
<i>Salix melanopsis</i> X <i>laevigata</i>	hybrid willow	Salicaceae	native	–	X	X
<i>Salix melanopsis</i> X <i>lasiolepis</i>	hybrid willow	Salicaceae	native	–	X	X
<i>Salix scouleriana</i>	Scouler's willow	Salicaceae	native	–	X	X
<i>Sambucus mexicana</i>	blue elderberry	Caprifoliaceae	native	–	X	X
<i>Sanguisorba minor</i> ssp. <i>muricata</i>	garden burnet	Rosaceae	non-native	–	X	
<i>Sanicula bipinnatifida</i>	purple sanicle	Apiaceae	native	–	X	
<i>Sanicula crassicaulis</i>	pacific blacksnakeroot	Apiaceae	native	–	X	
<i>Sanicula tuberosa</i>	turkey pea	Apiaceae	native	–	X	
<i>Saponaria officinalis</i>	bouncing bet	Caryophyllaceae	non-native	–		X
<i>Sarcodes sanguinea</i>	snowplant	Ericaceae	native	–	X	
<i>Saxifraga californica</i>	California saxifrage	Saxifragaceae	native	–	X	
<i>Scirpus microcarpus</i>	panicked bulrush	Cyperaceae	native	–	X	X
<i>Scirpus setaceus</i>	bristled dwarf bulrush	Cyperaceae	non-native	–		X
<i>Scleropodium obtusifolium</i>	obtuselaf scleropodium moss	Brachytheciaceae	native	–	X	X

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<i>Scleropodium touretii</i>	moss	Brachytheciaceae	native	–	X	
<i>Scrophularia californica</i>	California figwort	Scrophulariaceae	native	–	X	X
<i>Scrophularia desertorum</i>	desert figwort	Scrophulariaceae	native	–	X	
<i>Scutellaria californica</i>	California skullcap	Lamiaceae	native	–	X	
<i>Sedum obtusatum</i> ssp. <i>obtusatum</i>	Sierra stonecrop	Crassulaceae	native	–	X	
<i>Sedum spathulifolium</i>	yellow stonecrop	Crassulaceae	native	–	X	X
<i>Selaginella wallacei</i>	Wallace's spike-moss	Selaginellaceae	native	–	X	
<i>Senecio integerrimus</i>	forest groundsel	Asteraceae	native	–	X	
<i>Senecio triangularis</i>	arrowleaf groundsel	Asteraceae	native	–	X	X
<i>Senecio vulgaris</i>	common groundsel	Asteraceae	non-native	–	X	
<i>Setaria pumila</i>	yellow bristle grass	Poaceae	non-native	–		X
<i>Sidalcea malvaeflora</i> ssp. <i>asprella</i>	harsh checker-mallow	Malvaceae	native	–	X	
<i>Sidalcea multifida</i>	cutleaf checkermallow	Malvaceae	native	–	X	
<i>Sidalcea oregana</i> ssp. <i>spicata</i>	Oregon checkermallow	Malvaceae	native	–	X	
<i>Silene californica</i>	Indian pink	Caryophyllaceae	native	–	X	
<i>Silene lemmonii</i>	Lemmon's catchfly	Caryophyllaceae	native	–	X	X
<i>Sisyrinchium idahoense</i> var. <i>occidentale</i>	Idaho blueeyed grass	Iridaceae	native	–	X	
<i>Smilacina racemosa</i>	large false solomon's seal	Liliaceae	native	–	X	X
<i>Smilacina stellata</i>	little false solomon's seal	Liliaceae	native	–	X	
<i>Solanum americanum</i>	common nightshade	Solanaceae	native	–	X	X
<i>Solanum xanti</i>	purple nightshade	Solanaceae	native	–	X	
<i>Solidago californica</i>	California goldenrod	Asteraceae	native	–	X	X
<i>Solidago canadensis</i> ssp. <i>elongata</i>	Canada goldenrod	Asteraceae	native	–	X	X
<i>Sonchus asper</i> ssp. <i>asper</i>	prickly sowthistle	Asteraceae	non-native	–	X	
<i>Sorbus californica</i>	California mountainash	Rosaceae	native	–	X	
<i>Sorbus scopulina</i>	mountain ash	Rosaceae	native	–		X
<i>Spergularia rubra</i>	red sandspurry	Caryophyllaceae	non-native	–	X	X
<i>Sphenosciadium capitellatum</i>	swamp whiteheads	Apiaceae	native	–	X	
<i>Spiraea densiflora</i>	mountain spirea	Rosaceae	native	–	X	X
<i>Stachys ajugoides</i>	hedge nettle	Lamiaceae	native	–	X	X
<i>Stachys ajugoides</i> var. <i>ajugoides</i>	Ajuga hedge nettle	Lamiaceae	native	–	X	
<i>Stachys bullata</i>	hedge nettle	Lamiaceae	native	–		
<i>Stellaria longipes</i> var. <i>longipes</i>	meadow starwort	Caryophyllaceae	native	–	X	X
<i>Stellaria media</i>	common chickweed	Caryophyllaceae	non-native	–	X	X
<i>Stellaria nitens</i>	shining chickweed	Caryophyllaceae	native	–	X	
<i>Stephanomeria lactucina</i>	mountain lettuce	Asteraceae	native	–	X	



## Appendix C. Terrestrial, Aquatic, and Riparian Plants and Mosses Identified in the Study Area.

Scientific Name	Common Name	Family	Native/ Non-Native Species	Status <sup>1</sup>	Terrestrial Surveys	Aquatic/ Riparian Surveys
<i>Stephanomeria virgata</i> ssp. <i>pleurocarpa</i>	wand wirelettuce	Asteraceae	native	–	X	
<i>Streptanthus tortuosus</i>	shieldplant	Brassicaceae	native	–	X	
<i>Styrax officinalis</i> var. <i>redivivus</i>	California snowdrop bush	Styracaceae	native	–	X	X
<i>Symphoricarpos mollis</i>	creeping snowberry	Caprifoliaceae	native	–	X	X
<i>Symphoricarpos rotundifolius</i>	roundleaf snowberry	Caprifoliaceae	native	–	X	
<i>Syntrichia princeps</i>	moss	Pottiaceae	native	–	X	
<i>Taeniatherum caput-medusae</i>	Medusa-head	Poaceae	non-native	–	X	
<i>Taraxacum officinale</i>	common dandelion	Asteraceae	non-native	–	X	X
<i>Tauschia kelloggii</i>	Kellogg's tauschia	Apiaceae	native	–	X	
<i>Tellima grandiflora</i>	fringe cups	Saxifragaceae	native	–	X	
<i>Thalictrum fendleri</i>	Fendler's meadowrue	Ranunculaceae	native	–	X	X
<i>Thysanocarpus curvipes</i>	sand fringe pod	Brassicaceae	native	–	X	
<i>Torilis arvensis</i>	spreading hedgeparsley	Apiaceae	non-native	–	X	X
<i>Torreya californica</i>	California nutmeg	Taxaceae	native	–	X	X
<i>Torreyochloa pallida</i>	pale false mannagrass	Poaceae	native	–	X	X
<i>Toxicodendron diversilobum</i>	pacific poison oak	Anacardiaceae	native	–	X	X
<i>Tragopogon dubius</i>	yellow salsify, Goat's beard	Asteraceae	non-native	–	X	
<i>Trichostema oblongum</i>	oblong bluecurls	Lamiaceae	native	–	X	
<i>Trientalis latifolia</i>	starflower woodland star	Primulaceae	native	–	X	
<i>Trifolium campestre</i>	hop clover	Fabaceae	non-native	–	X	
<i>Trifolium ciliolatum</i>	foothill clover	Fabaceae	native	–	X	
<i>Trifolium cyathiferum</i>	cup clover	Fabaceae	native	–	X	
<i>Trifolium dubium</i>	shamrock	Fabaceae	non-native	–	X	
<i>Trifolium hirtum</i>	rose clover	Fabaceae	non-native	–	X	
<i>Trifolium hybridum</i>	alsike clover	Fabaceae	non-native	–	X	
<i>Trifolium longipes</i>	longstalk clover	Fabaceae	native	–	X	
<i>Trifolium microcephalum</i>	smallhead clover	Fabaceae	native	–	X	
<i>Trifolium obtusiflorum</i>	clammy clover	Fabaceae	native	–	X	
<i>Trifolium repens</i>	white clover	Fabaceae	non-native	–	X	X
<i>Trifolium variegatum</i>	variegated clover	Fabaceae	native	–	X	
<i>Trifolium willdenovii</i>	tomcat clover	Fabaceae	native	–	X	
<i>Trisetum spicatum</i>	spike trisetum, narrow oatgrass	Poaceae	native	–	X	X
<i>Triteleia hyacinthina</i>	white brodiaea	Liliaceae	native	–	X	
<i>Triteleia ixioides</i>	prettyface	Liliaceae	native	–	X	
<i>Triteleia laxa</i>	lithurial's spear	Liliaceae	native	–	X	
<i>Typha latifolia</i>	broadleaf cattail	Typhaceae	native	–	X	X

## Appendix C. Terrestrial, Aquatic, and Riparian Plants and Mosses Identified in the Study Area.

Scientific Name	Common Name	Family	Native/ Non-Native Species	Status <sup>1</sup>	Terrestrial Surveys	Aquatic/ Riparian Surveys
<i>Umbellularia californica</i>	California laurel	Lauraceae	native	–	X	X
<i>Uropappus lindleyi</i>	silver puffs	Asteraceae	native	–	X	
<i>Urtica dioica</i>	stinging nettle	Urticaceae	native	–	X	
<i>Vaccinium parvifolium</i>	red huckleberry	Ericaceae	native	–	X	X
<i>Veratrum californicum</i> var. <i>californicum</i>	California corn lily	Liliaceae	native	–	X	
<i>Verbascum thapsus</i>	common mullein, woolly mullein	Scrophulariaceae	non-native	–	X	X
<i>Verbena lasiostachys</i>	common verbena	Verbenaceae	native	–	X	X
<i>Verbena lasiostachys</i> var. <i>lasiostachys</i>	western vervain	Verbenaceae	native	–	X	
<i>Veronica americana</i>	American speedwell	Scrophulariaceae	native	–		X
<i>Veronica peregrina</i> ssp. <i>xalapensis</i>	hairy purslane, speedwell	Scrophulariaceae	native	–	X	
<i>Veronica serpyllifolia</i> ssp. <i>humifusa</i>	brightblue speedwell	Scrophulariaceae	native	–	X	
<i>Vicia americana</i> var. <i>americana</i>	American vetch	Fabaceae	native	–		X
<i>Vicia</i> sp.	vetch	Fabaceae	non-native	–	X	
<i>Viola adunca</i>	hookedspur violet	Violaceae	native	–	X	
<i>Viola glabella</i>	pioneer violet	Violaceae	native	–	X	X
<i>Viola lobata</i>	pine violet	Violaceae	native	–	X	X
<i>Viola lobata</i> ssp. <i>lobata</i>	moosehorn violet	Violaceae	native	–	X	
<i>Viola macloskeyi</i>	small white violet	Violaceae	native	–	X	
<i>Viola pinetorum</i>	pine violet	Violaceae	native	–	X	
<i>Viola purpurea</i>	goosefoot violet	Violaceae	native	–	X	X
<i>Viola purpurea</i> ssp. <i>integrifolia</i>	smooth-leaved violet	Violaceae	native	–	X	
<i>Viola purpurea</i> ssp. <i>purpurea</i>	goosefoot violet	Violaceae	native	–	X	
<i>Viola sheltonii</i>	Shelton's violet	Violaceae	native	–	X	
<i>Viola sororia</i> ssp. <i>affinis</i>	northern bog violet	Violaceae	native	–	X	
<i>Viola tomentosa</i>	woolly violet	Violaceae	native	CNPS 4.2	X	
<i>Vitis californica</i>	California wild grape	Vitaceae	native	–	X	X
<i>Vulpia microstachys</i> var. <i>pauciflora</i>	pacific fescue	Poaceae	native	–	X	
<i>Vulpia myuros</i>	rattail fescue	Poaceae	non-native	–	X	X
<i>Vulpia myuros</i> var. <i>myuros</i>	rattail fescue	Poaceae	non-native	–	X	
<i>Whitneya dealbata</i>	mock leopardbane	Asteraceae	native	–	X	
<i>Woodwardia fimbriata</i>	giant chain fern	Blechnaceae	native	–	X	X
<i>Wyethia mollis</i>	woolly wyethia	Asteraceae	native	–	X	
<i>Xanthium spinosum</i>	spiny cocklebur	Asteraceae	native	–	X	X
<i>Xanthium strumarium</i>	cocklebur	Asteraceae	native	–	X	X
<i>Yabea microcarpa</i>	falsecarrot	Apiaceae	native	–	X	
<i>Zigadenus venenosus</i> var. <i>venenosus</i>	death camas	Liliaceae	native	–	X	



**Appendix C. Terrestrial, Aquatic, and Riparian Plants and Mosses Identified in the Study Area.**

Scientific Name	Common Name	Family	Native/ Non-Native Species	Status <sup>1</sup>	Terrestrial Surveys	Aquatic/ Riparian Surveys
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<sup>1</sup> For the purposes of this document, a special-status plant is defined as any plant species that is granted protection by a federal or state agency. This includes species listed as FT, FE, FC, FSS, SR, ST, SE, and/or CNPS 1B and 2.

<b>LEGEND:</b>		<u>State Status</u>	<u>CNPS Status (California)</u>
<u>Federal Status</u>		SR = listed by California as Rare	1B = rare, threatened or endangered in California and elsewhere.
FT = Federal Threatened		ST = California Threatened	2 = rare in California but more common elsewhere.
FE = Federal Endangered		SE = California Endangered	3 = need more information
FC = Federal Candidate			4 = plants of limited distribution; a watch list.
FSS <sup>1</sup> = Forest Service Sensitive, Eldorado National Forest			__1 = Seriously endangered in California (over 80% of occurrences threatened / high degree
FSS <sup>2</sup> = Forest Service Sensitive, Tahoe National Forest			__2 = Fairly endangered in California (20-80% occurrences threatened)
FSS <sup>3</sup> = Forest Service Sensitive, Eldorado and Tahoe National			__3 = Not very endangered in California (<20% of occurrences threatened or no current threats

## **APPENDIX D**

### **Photographs of Stebbins' Phacelia and Typical Habitat in the Study Area**



**Photographs of Stebbins' Phacelia and Typical Habitat  
in the Study Area.**



Typical habitat on the north side of Hell Hole Reservoir.



A population on the shoreline of Hell Hole Reservoir.



**Photographs of Stebbins' Phacelia and Typical Habitat  
in the Study Area.**



An example of typical habitat in the vicinity of Hell Hole Campground.



A photograph of an individual plant at Hell Hole Campground.



**Photographs of Stebbins' Phacelia and Typical Habitat  
in the Study Area.**



A population along the French Meadows-Hell Hole Tunnel Portal Road.



Habitat located at the base of the bedrock cliff on French Meadows-Hell Hole Tunnel Portal Road.



**Photographs of Stebbins' Phacelia and Typical Habitat  
in the Study Area.**



A population at Hell Hole Vista.



A population at Duncan Creek Diversion Pool.



**APPENDIX E**  
**California Natural Diversity Database Field Survey Forms**

*For Office Use Only*  
Source Code \_\_\_\_\_ Quad Code \_\_\_\_\_  
Elm Code \_\_\_\_\_ Occ. No. \_\_\_\_\_  
EO Index No. \_\_\_\_\_ Map Index No. \_\_\_\_\_

Date of Field Work mm/dd/yyyy: \_\_\_\_\_

## California Native Species Field Survey Form

**Scientific Name:** \_\_\_\_\_

**Common Name:** \_\_\_\_\_

**Species Found?** ☐ Yes ☐ No \_\_\_\_\_  
If not, why? \_\_\_\_\_  
Total No. Individuals \_\_\_\_\_ Subsequent Visit? ☐ yes ☐ no  
**Is this an existing NDDDB occurrence?** ☐ no ☐ unk.  
Yes, Occ. # \_\_\_\_\_  
Collection? If yes: \_\_\_\_\_  
Number \_\_\_\_\_ Museum / Herbarium \_\_\_\_\_

**Reporter:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**E-mail Address:** \_\_\_\_\_

**Phone:** \_\_\_\_\_

### Plant Information

Phenology: \_\_\_\_\_ % vegetative \_\_\_\_\_ % flowering \_\_\_\_\_ % fruiting

### Animal Information

# adults # juveniles # larvae # egg masses # unknown  
☐ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☐ other

### Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: \_\_\_\_\_ Landowner / Mgr.: \_\_\_\_\_  
Quad Name: \_\_\_\_\_ Elevation: \_\_\_\_\_  
T \_\_\_\_\_ R \_\_\_\_\_ Sec \_\_\_\_\_, \_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4, Meridian: H M S Source of Coordinates (GPS, topo. map & type): \_\_\_\_\_  
T \_\_\_\_\_ R \_\_\_\_\_ Sec \_\_\_\_\_, \_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4, Meridian: H M S GPS Make & Model \_\_\_\_\_  
Datum: NAD27 NAD83 WGS84 Horizontal Accuracy \_\_\_\_\_ meters/feet  
Coordinate System: UTM Zone 10 UTM Zone 11 OR Geographic (Latitude & Longitude)  
Coordinates: Easting/Longitude \_\_\_\_\_ Northing/Latitude \_\_\_\_\_

### Habitat Description (plant communities, dominants, associates, substrates/soils, aspects/slope):

Other rare taxa seen at THIS site on THIS date:

**Site Information** Overall site quality: ☐ Excellent ☐ Good ☐ Fair ☐ Poor

Current / surrounding land use:

Visible disturbances:

Threats:

Comments:

### Determination: (check one or more, and fill in blanks)

Keyed (cite reference): \_\_\_\_\_  
Compared with specimen housed at: \_\_\_\_\_  
Compared with photo / drawing in: \_\_\_\_\_  
By another person (name): \_\_\_\_\_  
Other: \_\_\_\_\_

**Photographs:** (check one or more) Slide Print Digital  
Plant / animal  
Habitat  
Diagnostic feature

May we obtain duplicates at our expense? yes no



*For Office Use Only*

Source Code \_\_\_\_\_ Quad Code \_\_\_\_\_  
 Elm Code \_\_\_\_\_ Occ. No. \_\_\_\_\_  
 EO Index No. \_\_\_\_\_ Map Index No. \_\_\_\_\_

**Date of Field Work** mm/dd/yyyy: \_\_\_\_\_

## California Native Species Field Survey Form

**Scientific Name:** \_\_\_\_\_

**Common Name:** \_\_\_\_\_

**Species Found?** ☐ Yes ☐ No \_\_\_\_\_  
 If not, why? \_\_\_\_\_

Total No. Individuals \_\_\_\_\_ Subsequent Visit? ☐ yes ☐ no  
**Is this an existing NDDB occurrence?** ☐ no ☐ unk.  
 Yes, Occ. # \_\_\_\_\_

Collection? If yes: \_\_\_\_\_  
 Number \_\_\_\_\_ Museum / Herbarium \_\_\_\_\_

**Reporter:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**E-mail Address:** \_\_\_\_\_

**Phone:** \_\_\_\_\_

### Plant Information

Phenology: \_\_\_\_\_ % vegetative \_\_\_\_\_ % flowering \_\_\_\_\_ % fruiting

### Animal Information

# adults \_\_\_\_\_ # juveniles \_\_\_\_\_ # larvae \_\_\_\_\_ # egg masses \_\_\_\_\_ # unknown \_\_\_\_\_  
☐ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☐ other

### Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: \_\_\_\_\_ Landowner / Mgr.: \_\_\_\_\_  
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 Coordinates: Easting/Longitude \_\_\_\_\_ Northing/Latitude \_\_\_\_\_

### Habitat Description (plant communities, dominants, associates, substrates/soils, aspects/slope):

Other rare taxa seen at THIS site on THIS date: \_\_\_\_\_

**Site Information** Overall site quality: ☐ Excellent ☐ Good ☐ Fair ☐ Poor

Current / surrounding land use: \_\_\_\_\_

Visible disturbances: \_\_\_\_\_

Threats: \_\_\_\_\_

Comments: \_\_\_\_\_

### Determination: (check one or more, and fill in blanks)

Keyed (cite reference): \_\_\_\_\_  
 Compared with specimen housed at: \_\_\_\_\_  
 Compared with photo / drawing in: \_\_\_\_\_  
 By another person (name): \_\_\_\_\_  
 Other: \_\_\_\_\_

**Photographs:** (check one or more) Slide ☐ Print ☐ Digital ☐  
 Plant / animal ☐  
 Habitat ☐  
 Diagnostic feature ☐

May we obtain duplicates at our expense? yes ☐ no ☐

*For Office Use Only*  
Source Code \_\_\_\_\_ Quad Code \_\_\_\_\_  
Elm Code \_\_\_\_\_ Occ. No. \_\_\_\_\_  
EO Index No. \_\_\_\_\_ Map Index No. \_\_\_\_\_

Date of Field Work mm/dd/yyyy: \_\_\_\_\_

## California Native Species Field Survey Form

**Scientific Name:** \_\_\_\_\_

**Common Name:** \_\_\_\_\_

**Species Found?** ☐ Yes ☐ No \_\_\_\_\_  
If not, why? \_\_\_\_\_  
Total No. Individuals \_\_\_\_\_ Subsequent Visit? ☐ yes ☐ no  
**Is this an existing NDDDB occurrence?** ☐ no ☐ unk.  
Yes, Occ. # \_\_\_\_\_  
Collection? If yes: \_\_\_\_\_  
Number \_\_\_\_\_ Museum / Herbarium \_\_\_\_\_

**Reporter:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**E-mail Address:** \_\_\_\_\_

**Phone:** \_\_\_\_\_

### Plant Information

Phenology: \_\_\_\_\_ % vegetative \_\_\_\_\_ % flowering \_\_\_\_\_ % fruiting

### Animal Information

# adults # juveniles # larvae # egg masses # unknown  
☐ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☐ other

### Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: \_\_\_\_\_ Landowner / Mgr.: \_\_\_\_\_  
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Coordinates: Easting/Longitude \_\_\_\_\_ Northing/Latitude \_\_\_\_\_

### Habitat Description (plant communities, dominants, associates, substrates/soils, aspects/slope):

Other rare taxa seen at THIS site on THIS date:

**Site Information** Overall site quality: ☐ Excellent ☐ Good ☐ Fair ☐ Poor

Current / surrounding land use:

Visible disturbances:

Threats:

Comments:

### Determination: (check one or more, and fill in blanks)

Keyed (cite reference): \_\_\_\_\_  
Compared with specimen housed at: \_\_\_\_\_  
Compared with photo / drawing in: \_\_\_\_\_  
By another person (name): \_\_\_\_\_  
Other: \_\_\_\_\_

**Photographs:** (check one or more) Slide Print Digital  
Plant / animal  
Habitat  
Diagnostic feature

May we obtain duplicates  
at our expense? yes no



*For Office Use Only*  
Source Code \_\_\_\_\_ Quad Code \_\_\_\_\_  
Elm Code \_\_\_\_\_ Occ. No. \_\_\_\_\_  
EO Index No. \_\_\_\_\_ Map Index No. \_\_\_\_\_

Date of Field Work mm/dd/yyyy: \_\_\_\_\_

## California Native Species Field Survey Form

**Scientific Name:** \_\_\_\_\_

**Common Name:** \_\_\_\_\_

**Species Found?** ☐ Yes ☐ No \_\_\_\_\_  
If not, why? \_\_\_\_\_  
Total No. Individuals \_\_\_\_\_ Subsequent Visit? ☐ yes ☐ no  
**Is this an existing NDDB occurrence?** ☐ no ☐ unk.  
Yes, Occ. # \_\_\_\_\_  
Collection? If yes: \_\_\_\_\_  
Number \_\_\_\_\_ Museum / Herbarium \_\_\_\_\_

**Reporter:** \_\_\_\_\_

**Address:** \_\_\_\_\_

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**Phone:** \_\_\_\_\_

### Plant Information

Phenology: \_\_\_\_\_ % vegetative \_\_\_\_\_ % flowering \_\_\_\_\_ % fruiting

### Animal Information

# adults # juveniles # larvae # egg masses # unknown  
☐ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☐ other

### Location Description (please attach map AND/OR fill out your choice of coordinates, below)

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Coordinates: Easting/Longitude \_\_\_\_\_ Northing/Latitude \_\_\_\_\_

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Other rare taxa seen at THIS site on THIS date:

**Site Information** Overall site quality: ☐ Excellent ☐ Good ☐ Fair ☐ Poor

Current / surrounding land use:

Visible disturbances:

Threats:

Comments:

### Determination: (check one or more, and fill in blanks)

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Other: \_\_\_\_\_

**Photographs:** (check one or more) Slide Print Digital  
Plant / animal  
Habitat  
Diagnostic feature

May we obtain duplicates  
at our expense? yes no

For Office Use Only  
Source Code \_\_\_\_\_ Quad Code \_\_\_\_\_  
Elm Code \_\_\_\_\_ Occ. No. \_\_\_\_\_  
EO Index No. \_\_\_\_\_ Map Index No. \_\_\_\_\_

Date of Field Work mm/dd/yyyy: \_\_\_\_\_

## California Native Species Field Survey Form

Scientific Name: \_\_\_\_\_

Common Name: \_\_\_\_\_

Species Found? ☐ Yes ☐ No \_\_\_\_\_  
If not, why? \_\_\_\_\_  
Total No. Individuals \_\_\_\_\_ Subsequent Visit? ☐ yes ☐ no  
Is this an existing NDDDB occurrence? ☐ no ☐ unk.  
Yes, Occ. # \_\_\_\_\_  
Collection? If yes: \_\_\_\_\_  
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### Plant Information

Phenology: \_\_\_\_\_ % vegetative \_\_\_\_\_ % flowering \_\_\_\_\_ % fruiting

### Animal Information

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T \_\_\_\_\_ R \_\_\_\_\_ Sec \_\_\_\_\_, \_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4, Meridian: H M S GPS Make & Model \_\_\_\_\_  
Datum: NAD27 NAD83 WGS84 Horizontal Accuracy \_\_\_\_\_ meters/feet  
Coordinate System: UTM Zone 10 UTM Zone 11 OR Geographic (Latitude & Longitude)  
Coordinates: Easting/Longitude \_\_\_\_\_ Northing/Latitude \_\_\_\_\_

### Habitat Description (plant communities, dominants, associates, substrates/soils, aspects/slope):

Other rare taxa seen at THIS site on THIS date:

Site Information Overall site quality: ☐ Excellent ☐ Good ☐ Fair ☐ Poor

Current / surrounding land use:

Visible disturbances:

Threats:

Comments:

### Determination: (check one or more, and fill in blanks)

Keyed (cite reference): \_\_\_\_\_  
Compared with specimen housed at: \_\_\_\_\_  
Compared with photo / drawing in: \_\_\_\_\_  
By another person (name): \_\_\_\_\_  
Other: \_\_\_\_\_

Photographs: (check one or more) Slide Print Digital  
Plant / animal  
Habitat  
Diagnostic feature

May we obtain duplicates  
at our expense? yes no



*For Office Use Only*  
Source Code \_\_\_\_\_ Quad Code \_\_\_\_\_  
Elm Code \_\_\_\_\_ Occ. No. \_\_\_\_\_  
EO Index No. \_\_\_\_\_ Map Index No. \_\_\_\_\_

Date of Field Work mm/dd/yyyy: \_\_\_\_\_

## California Native Species Field Survey Form

**Scientific Name:** \_\_\_\_\_

**Common Name:** \_\_\_\_\_

**Species Found?** ☐ Yes ☐ No \_\_\_\_\_  
If not, why? \_\_\_\_\_  
Total No. Individuals \_\_\_\_\_ Subsequent Visit? ☐ yes ☐ no  
**Is this an existing NDDDB occurrence?** ☐ no ☐ unk.  
Yes, Occ. # \_\_\_\_\_  
Collection? If yes: \_\_\_\_\_  
Number \_\_\_\_\_ Museum / Herbarium \_\_\_\_\_

**Reporter:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**E-mail Address:** \_\_\_\_\_

**Phone:** \_\_\_\_\_

### Plant Information

Phenology: \_\_\_\_\_ % vegetative \_\_\_\_\_ % flowering \_\_\_\_\_ % fruiting

### Animal Information

# adults # juveniles # larvae # egg masses # unknown  
☐ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☐ other

### Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: \_\_\_\_\_ Landowner / Mgr.: \_\_\_\_\_  
Quad Name: \_\_\_\_\_ Elevation: \_\_\_\_\_  
T \_\_\_\_\_ R \_\_\_\_\_ Sec \_\_\_\_\_, \_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4, Meridian: H M S Source of Coordinates (GPS, topo. map & type): \_\_\_\_\_  
T \_\_\_\_\_ R \_\_\_\_\_ Sec \_\_\_\_\_, \_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4, Meridian: H M S GPS Make & Model \_\_\_\_\_  
Datum: NAD27 NAD83 WGS84 Horizontal Accuracy \_\_\_\_\_ meters/feet  
Coordinate System: UTM Zone 10 UTM Zone 11 OR Geographic (Latitude & Longitude)  
Coordinates: Easting/Longitude \_\_\_\_\_ Northing/Latitude \_\_\_\_\_

### Habitat Description (plant communities, dominants, associates, substrates/soils, aspects/slope):

Other rare taxa seen at THIS site on THIS date: \_\_\_\_\_

**Site Information** Overall site quality: ☐ Excellent ☐ Good ☐ Fair ☐ Poor

Current / surrounding land use: \_\_\_\_\_

Visible disturbances: \_\_\_\_\_

Threats: \_\_\_\_\_

Comments: \_\_\_\_\_

### Determination: (check one or more, and fill in blanks)

Keyed (cite reference): \_\_\_\_\_  
Compared with specimen housed at: \_\_\_\_\_  
Compared with photo / drawing in: \_\_\_\_\_  
By another person (name): \_\_\_\_\_  
Other: \_\_\_\_\_

**Photographs:** (check one or more) Slide Print Digital  
Plant / animal  
Habitat  
Diagnostic feature

May we obtain duplicates at our expense? yes no

*For Office Use Only*  
Source Code \_\_\_\_\_ Quad Code \_\_\_\_\_  
Elm Code \_\_\_\_\_ Occ. No. \_\_\_\_\_  
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Yes, Occ. # \_\_\_\_\_  
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### Animal Information

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Other rare taxa seen at THIS site on THIS date:

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Current / surrounding land use:

Visible disturbances:

Threats:

Comments:

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**Photographs:** (check one or more) Slide Print Digital  
Plant / animal  
Habitat  
Diagnostic feature

May we obtain duplicates at our expense? yes no



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Date of Field Work mm/dd/yyyy: \_\_\_\_\_

## California Native Species Field Survey Form

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Photographs: (check one or more) Slide Print Digital  
Plant / animal  
Habitat  
Diagnostic feature

May we obtain duplicates at our expense? yes no

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If not, why? \_\_\_\_\_  
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Plant / animal  
Habitat  
Diagnostic feature

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