SPECIAL-STATUS PLANTS STUDY REPORT

DON PEDRO PROJECT
FERC NO. 2299



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MID
Modesto Irrigation District

Prepared for:
Turlock Irrigation District – Turlock, California
Modesto Irrigation District – Modesto, California

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Special-Status Plants
Study Report

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List of Acronyms

ac .....acres

ACEC .....Area of Critical Environmental Concern

AF .....acre-feet

ACOE.....U.S. Army Corps of Engineers

ADA .....Americans with Disabilities Act

ALJ.....Administrative Law Judge

APE .....Area of Potential Effect

ARMR.....Archaeological Resource Management Report

BA .....Biological Assessment

BDCP .....Bay-Delta Conservation Plan

BLM .....U.S. Department of the Interior, Bureau of Land Management

BLM-S .....Bureau of Land Management – Sensitive Species

BMI .....Benthic macroinvertebrates

BMP .....Best Management Practices

BO .....Biological Opinion

CalEPPC .....California Exotic Pest Plant Council

CalSPA.....California Sports Fisherman Association

CAS.....California Academy of Sciences

CCC.....Criterion Continuous Concentrations

CCIC .....Central California Information Center

CCSF .....City and County of San Francisco

CCVHJV .....California Central Valley Habitat Joint Venture

CD .....Compact Disc

CDBW.....California Department of Boating and Waterways

CDEC .....California Data Exchange Center

CDFA .....California Department of Food and Agriculture

CDFG .....California Department of Fish and Game (as of January 2013, Department of Fish and Wildlife)

CDMG.....California Division of Mines and Geology

CDOF .....California Department of Finance

CDPH .....California Department of Public Health

CDPR .....California Department of Parks and Recreation
CDSOD .....California Division of Safety of Dams
CDWR.....California Department of Water Resources
CE .....California Endangered Species
CEII.....Critical Energy Infrastructure Information
CEQA.....California Environmental Quality Act
CESA .....California Endangered Species Act
CFR.....Code of Federal Regulations
cfs.....cubic feet per second
CGS.....California Geological Survey
CMAP .....California Monitoring and Assessment Program
CMC.....Criterion Maximum Concentrations
CNDDB.....California Natural Diversity Database
CNPS.....California Native Plant Society
CORP .....California Outdoor Recreation Plan
CPUE .....Catch Per Unit Effort
CRAM.....California Rapid Assessment Method
CRLF.....California Red-Legged Frog
CRRF .....California Rivers Restoration Fund
CSAS.....Central Sierra Audubon Society
CSBP.....California Stream Bioassessment Procedure
CT .....California Threatened Species
CTR.....California Toxics Rule
CTS .....California Tiger Salamander
CVRWQCB .....Central Valley Regional Water Quality Control Board
CWA .....Clean Water Act
CWHR.....California Wildlife Habitat Relationship
Districts.....Turlock Irrigation District and Modesto Irrigation District
DLA .....Draft License Application
DPRA.....Don Pedro Recreation Agency
DPS .....Distinct Population Segment
EA .....Environmental Assessment
EC .....Electrical Conductivity

EFH.....Essential Fish Habitat
EIR.....Environmental Impact Report
EIS.....Environmental Impact Statement
EPA.....U.S. Environmental Protection Agency
ESA.....Federal Endangered Species Act
ESRCD.....East Stanislaus Resource Conservation District
ESU.....Evolutionary Significant Unit
EWUA.....Effective Weighted Useable Area
FERC.....Federal Energy Regulatory Commission
FFS.....Foothills Fault System
FL.....Fork length
FMU.....Fire Management Unit
FOT.....Friends of the Tuolumne
FPC.....Federal Power Commission
ft/mi.....feet per mile
FWCA.....Fish and Wildlife Coordination Act
FYLF.....Foothill Yellow-Legged Frog
g.....grams
GIS.....Geographic Information System
GLO.....General Land Office
GPS.....Global Positioning System
HCP.....Habitat Conservation Plan
HHWP.....Hetch Hetchy Water and Power
HORB.....Head of Old River Barrier
HPMP.....Historic Properties Management Plan
ILP.....Integrated Licensing Process
ISR.....Initial Study Report
ITA.....Indian Trust Assets
kV.....kilovolt
m.....meters
M&I.....Municipal and Industrial
MCL.....Maximum Contaminant Level
mg/kg.....milligrams/kilogram

mg/L .....milligrams per liter
mgd .....million gallons per day
mi .....miles
mi^2 .....square miles
MID.....Modesto Irrigation District
MOU .....Memorandum of Understanding
MSCS.....Multi-Species Conservation Strategy
msl.....mean sea level
MVA .....Megavolt Ampere
MW .....megawatt
MWh .....megawatt hour
mya.....million years ago
NAE .....National Academy of Engineering
NAHC .....Native American Heritage Commission
NAS.....National Academy of Sciences
NAVD 88 .....North American Vertical Datum of 1988
NAWQA .....National Water Quality Assessment
NCCP .....Natural Community Conservation Plan
NEPA .....National Environmental Policy Act
ng/g .....nanograms per gram
NGOs .....Non-Governmental Organizations
NHI .....Natural Heritage Institute
NHPA.....National Historic Preservation Act
NISC .....National Invasive Species Council
NMFS.....National Marine Fisheries Service
NOAA .....National Oceanic and Atmospheric Administration
NOI .....Notice of Intent
NPS .....U.S. Department of the Interior, National Park Service
NRCS .....National Resource Conservation Service
NRHP .....National Register of Historic Places
NRI.....Nationwide Rivers Inventory
NTU .....Nephelometric Turbidity Unit
NWI.....National Wetland Inventory

NWIS .....National Water Information System
NWR .....National Wildlife Refuge
NGVD 29 .....National Geodetic Vertical Datum of 1929
O&M .....operation and maintenance
OEHHA.....Office of Environmental Health Hazard Assessment
ORV .....Outstanding Remarkable Value
PAD.....Pre-Application Document
PDO.....Pacific Decadal Oscillation
PEIR.....Program Environmental Impact Report
PGA.....Peak Ground Acceleration
PHG.....Public Health Goal
PM&E .....Protection, Mitigation and Enhancement
PMF.....Probable Maximum Flood
POAOR.....Public Opinions and Attitudes in Outdoor Recreation
ppb.....parts per billion
ppm .....parts per million
PSP.....Proposed Study Plan
QA.....Quality Assurance
QC.....Quality Control
RA.....Recreation Area
RBP.....Rapid Bioassessment Protocol
Reclamation .....U.S. Department of the Interior, Bureau of Reclamation
RM .....River Mile
RMP .....Resource Management Plan
RP.....Relicensing Participant
RSP .....Revised Study Plan
RST .....Rotary Screw Trap
RWF.....Resource-Specific Work Groups
RWG .....Resource Work Group
RWQCB.....Regional Water Quality Control Board
SC.....State candidate for listing under CESA
SCD.....State candidate for delisting under CESA
SCE .....State candidate for listing as endangered under CESA

SCT .....State candidate for listing as threatened under CESA

SD1 .....Scoping Document 1

SD2 .....Scoping Document 2

SE.....State Endangered Species under the CESA

SFP.....State Fully Protected Species under CESA

SFPUC .....San Francisco Public Utilities Commission

SHPO .....State Historic Preservation Office

SJRA .....San Joaquin River Agreement

SJRGA .....San Joaquin River Group Authority

SJTA .....San Joaquin River Tributaries Authority

SPD .....Study Plan Determination

SRA.....State Recreation Area

SRMA .....Special Recreation Management Area or Sierra Resource Management Area (as per use)

SRMP.....Sierra Resource Management Plan

SRP .....Special Run Pools

SSC .....State species of special concern

ST.....California Threatened Species under the CESA

STORET .....Storage and Retrieval

SWAMP.....Surface Water Ambient Monitoring Program

SWE .....Snow-Water Equivalent

SWRCB.....State Water Resources Control Board

TAC.....Technical Advisory Committee

TAF .....thousand acre-feet

TCP .....Traditional Cultural Properties

TDS.....Total Dissolved Solids

TID.....Turlock Irrigation District

TMDL .....Total Maximum Daily Load

TOC.....Total Organic Carbon

TRT.....Tuolumne River Trust

TRTAC .....Tuolumne River Technical Advisory Committee

UC.....University of California

USDA.....U.S. Department of Agriculture

USDOC .....U.S. Department of Commerce
USDOI .....U.S. Department of the Interior
USFS .....U.S. Department of Agriculture, Forest Service
USFWS .....U.S. Department of the Interior, Fish and Wildlife Service
USGS .....U.S. Department of the Interior, Geological Survey
USR.....Updated Study Report
UTM.....Universal Transverse Mercator
VAMP .....Vernalis Adaptive Management Plan
VELB .....Valley Elderberry Longhorn Beetle
VRM .....Visual Resource Management
WPT .....Western Pond Turtle
WSA.....Wilderness Study Area
WSIP .....Water System Improvement Program
WWTP .....Wastewater Treatment Plant
WY .....water year
µS/cm……..microSeimens per centimeter

1.0 INTRODUCTION

1.1 General Description of the Don Pedro Project

Turlock Irrigation District (TID) and Modesto Irrigation District (MID) (collectively, the Districts) are the co-licensees of the 168-megawatt (MW) Don Pedro Project (Project) located on the Tuolumne River in western Tuolumne County in the Central Valley region of California. The Don Pedro Dam is located at river mile (RM) 54.8 and the Don Pedro Reservoir formed by the dam extends 24-miles upstream at the normal maximum water surface elevation of 830 ft above mean sea level (msl; NGVD 29). At elevation 830 ft, the reservoir stores over 2,000,000 acre-feet (AF) of water and has a surface area slightly less than 13,000 acres (ac). The watershed above Don Pedro Dam is approximately 1,533 square miles (mi^2).

Both TID and MID are local public agencies authorized under the laws of the State of California to provide water supply for irrigation and municipal and industrial (M&I) uses and to provide retail electric service. The Project serves many purposes including providing water storage for the beneficial use of irrigation of over 200,000 ac of prime Central Valley farmland and for the use of M&I customers in the City of Modesto (population 210,000). Consistent with the requirements of the Raker Act passed by Congress in 1913 and agreements between the Districts and City and County of San Francisco (CCSF), the Project reservoir also includes a "water bank" of up to 570,000 AF of storage. CCSF may use the water bank to more efficiently manage the water supply from its Hetch Hetchy water system while meeting the senior water rights of the Districts. CCSF's "water bank" within Don Pedro Reservoir provides significant benefits for its 2.6 million customers in the San Francisco Bay Area.

The Project also provides storage for flood management purposes in the Tuolumne and San Joaquin rivers in coordination with the U.S. Army Corps of Engineers (ACOE). Other important uses supported by the Project are recreation, protection of the anadromous fisheries in the lower Tuolumne River, and hydropower generation.

The Project Boundary extends from approximately one mile downstream of the dam to approximately RM 79 upstream of the dam. Upstream of the dam, the Project Boundary runs generally along the 855 ft contour interval which corresponds to the top of the Don Pedro Dam. The Project Boundary encompasses approximately 18,370 ac with 78 percent of the lands owned jointly by the Districts and the remaining 22 percent (approximately 4,000 ac) is owned by the United States and managed as a part of the U.S. Bureau of Land Management (BLM) Sierra Resource Management Area.

The primary Project facilities include the 580-foot-high Don Pedro Dam and Reservoir completed in 1971; a four-unit powerhouse situated at the base of the dam; related facilities including the Project spillway, outlet works, and switchyard; four dikes (Gasburg Creek Dike and Dikes A, B, and C); and three developed recreational facilities (Fleming Meadows, Blue Oaks, and Moccasin Point Recreation Areas). The location of the Project and its primary facilities is shown in Figure 1.1-1.

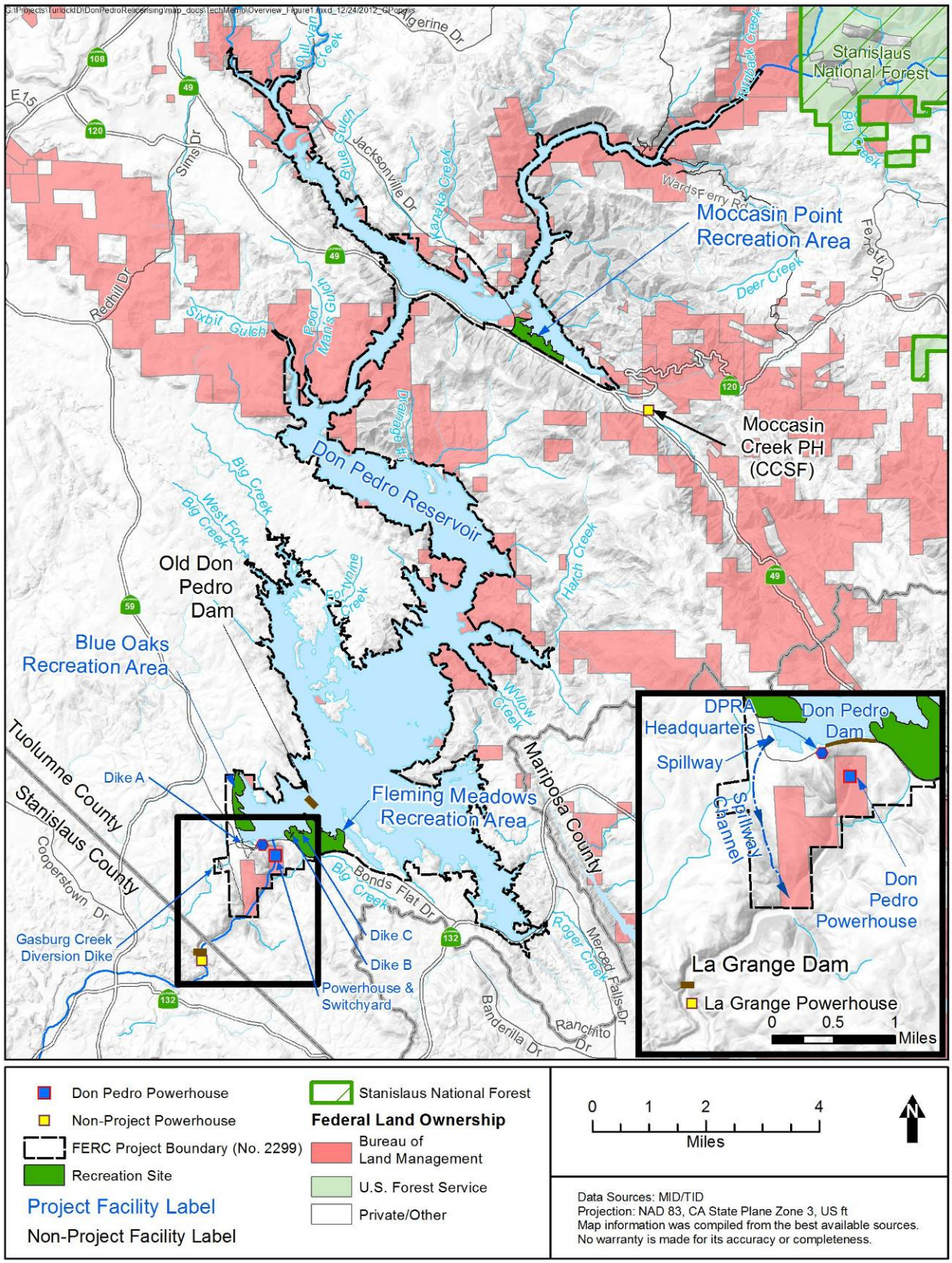

Figure 1.1-1. Don Pedro Project location.

1.2 Relicensing Process

The current FERC license for the Project expires on April 30, 2016, and the Districts will apply for a new license no later than April 30, 2014. The Districts began the relicensing process by filing a Notice of Intent and Pre-Application Document (PAD) with FERC on February 10, 2011, following the regulations governing the Integrated Licensing Process (ILP). The Districts' PAD included descriptions of the Project facilities, operations, license requirements, and Project lands as well as a summary of the extensive existing information available on Project area resources. The PAD also included ten draft study plans describing a subset of the Districts' proposed relicensing studies. The Districts then convened a series of Resource Work Group meetings, engaging agencies and other relicensing participants in a collaborative study plan development process culminating in the Districts' Proposed Study Plan (PSP) and Revised Study Plan (RSP) filings to FERC on July 25, 2011 and November 22, 2011, respectively.

On December 22, 2011, FERC issued its Study Plan Determination (SPD) for the Project, approving, or approving with modifications, 34 studies proposed in the RSP that addressed Cultural and Historical Resources, Recreational Resources, Terrestrial Resources, and Water and Aquatic Resources. In addition, as required by the SPD, the Districts filed three new study plans (W&AR-18, W&AR-19, and W&AR-20) on February 28, 2012 and one modified study plan (W&AR-12) on April 6, 2012. Prior to filing these plans with FERC, the Districts consulted with relicensing participants on drafts of the plans. FERC approved or approved with modifications these four studies on July 25, 2012.

Following the SPD, a total of seven studies (and associated study elements) that were either not adopted in the SPD, or were adopted with modifications, formed the basis of Study Dispute proceedings. In accordance with the ILP, FERC convened a Dispute Resolution Panel on April 17, 2012 and the Panel issued its findings on May 4, 2012. On May 24, 2012, the Director of FERC issued his Formal Study Dispute Determination, with additional clarifications related to the Formal Study Dispute Determination issued on August 17, 2012.

This study report describes the objectives, methods, and results of the Special-Status Plants Study (TR-01) as implemented by the Districts in accordance with FERC's SPD and subsequent study modifications and clarifications. Documents relating to the Project relicensing are publicly available on the Districts' relicensing website at www.donpedro-relicensing.com.

1.3 Study Plan

Operation and maintenance (O&M) of the Project and/or Project-related recreation activities may have the potential to affect special-status plants. These effects may be direct (i.e., result of ground disturbing activities such as mechanical or chemical clearing of vegetation or trampling of plants), indirect (i.e., due to activities such as soil compaction which limits plant growth), or cumulative (i.e., caused by a Project activity in association with a non-Project activity, such as loss of habitat due to the introduction of invasive plants from a non-Project vector).

FERC's SPD approved with modifications the Districts' Special-Status Plants study plan as provided in the Districts' RSP filing dated November 22, 2011. In its SPD, FERC ordered that the Districts include in their study area lands up to 300 feet outside the Project Boundary within high-use recreation areas or the BLM's Red Hills ACEC, and to document the full extent of each special-status plant occurrence, up to one quarter mile outside the Project Boundary.

The Districts carried out the Special-Status Plants study consistent with each of these directives.

For the purpose of this study, special-status plants were defined as plant species that are:

- Found on public land administered by the United States Department of Interior, Bureau of Land Management (BLM) and formally listed by the BLM as Sensitive Species (BLM-S).
- Listed under the federal Endangered Species Act (ESA) as Proposed or a Candidate for listing as endangered or threatened or proposed for delisting.
- Listed under the State of California Endangered Species Act (CESA) as proposed for listing.
- Found on the California Department of Fish and Game's (CDFG) list of California Rare (SR) species listed under the Native Species Plant Protection Act of 1977.
- Found on the California Native Plant Society (CNPS) Inventory of Rare Plants and formally listed as a CNPS 1, 2, or 3 plants (CNPS 1, CNPS 2, CNPS 3).

Plants listed under the federal ESA or the CESA – even if they are also considered BLM-S, CNPS 1, CNPS 2 or CNPS 3 – are considered separately, in Study Report TR-02, ESA- and CESA-listed Plants.

2.0 STUDY GOALS AND OBJECTIVES

The goal of the study is to determine the presence and distribution of special-status plants within the Project study area (Section 3.0) and determine whether continued Project O&M or recreational use of Project facilities have a measurable, adverse effect on special-status plants.

The study focused on gathering the information necessary to perform this analysis and evaluate the Project's potential to adversely affect special-status plants.

3.0 STUDY AREA

The study area consisted of lands within the Project Boundary that are subject to Project-related O&M or recreation activities, including high-use dispersed recreation areas. The study area is shown in Figure 3.0-1 and included the following specific areas:

- The Blue Oaks, Fleming Meadows, and Moccasin Point Recreation areas and related facilities, including the 3.5-mile Don Pedro Shoreline Trail;
- High-use dispersed recreation areas, as identified by Districts' staff;
- Lands within the Project Boundary designated as part of the BLM's Red Hills Area of Critical Environmental Concern (ACEC);
- Don Pedro Dam, Powerhouse, and Switchyard, including related maintenance and storage facilities and the powerhouse access road;
- The Don Pedro Spillway channel and related access roads;
- The Gasburg Creek diversion dike and related access roads;
- Employee housing near Don Pedro Dam;
- Don Pedro Recreation Agency headquarters and visitor center;
- Dikes A, B, and C in the vicinity of Don Pedro Dam; and
- The Ward's Ferry take-out.

The study area also included the following habitats adjacent to the lands specified above:

- Out to 300 feet (ft) or the Project Boundary, whichever is greater, within the high-use dispersed recreation areas and facilities;
- Out to 300 ft from the high water mark of the Project reservoir, or the Project Boundary, whichever is greater, within BLM lands in the Red Hills ACEC; and
- For special-status plant occurrences found within the study area, to the full extent of the occurrence, or to one quarter mile outside the Project Boundary, whichever was less.[1]

Per the study plan, areas with unsafe terrain, as identified in the field, were not surveyed.[2] These included dangerously steep slopes, areas of thick poison oak (*Toxicodendron diversilobum*) and other areas that were unsafe for field crews to enter. This included some of the steep slopes of below the dam; a steep slope, composed of thick chaparral, at Moccasin Point Recreation Area; a piece of the Willow Creek arm, due to impenetrable chamise (*Adenostoma fasiculatum*), steep slopes and poison oak; the very tip of the Shawmut Road area, due to steep slopes; the steepest sections of the Ward's Ferry area; steep slopes in the upper area of Woods Creek Arm and a section of steep slopes on the edge of the Ramos Creek area.

[1] For the purpose of this study, this area is referred to as the possible study extent.
[2] A small percentage (5 percent) of the study area was inaccessible due to unsafe terrain (approximately 200 acres).

The Districts requested access to private lands within the possible study extent in a letter sent to 303 landowners on February 12, 2012. Of these, 83 granted and 220 denied access to their land; private lands for which access was denied, or for which no response was received, were not surveyed.

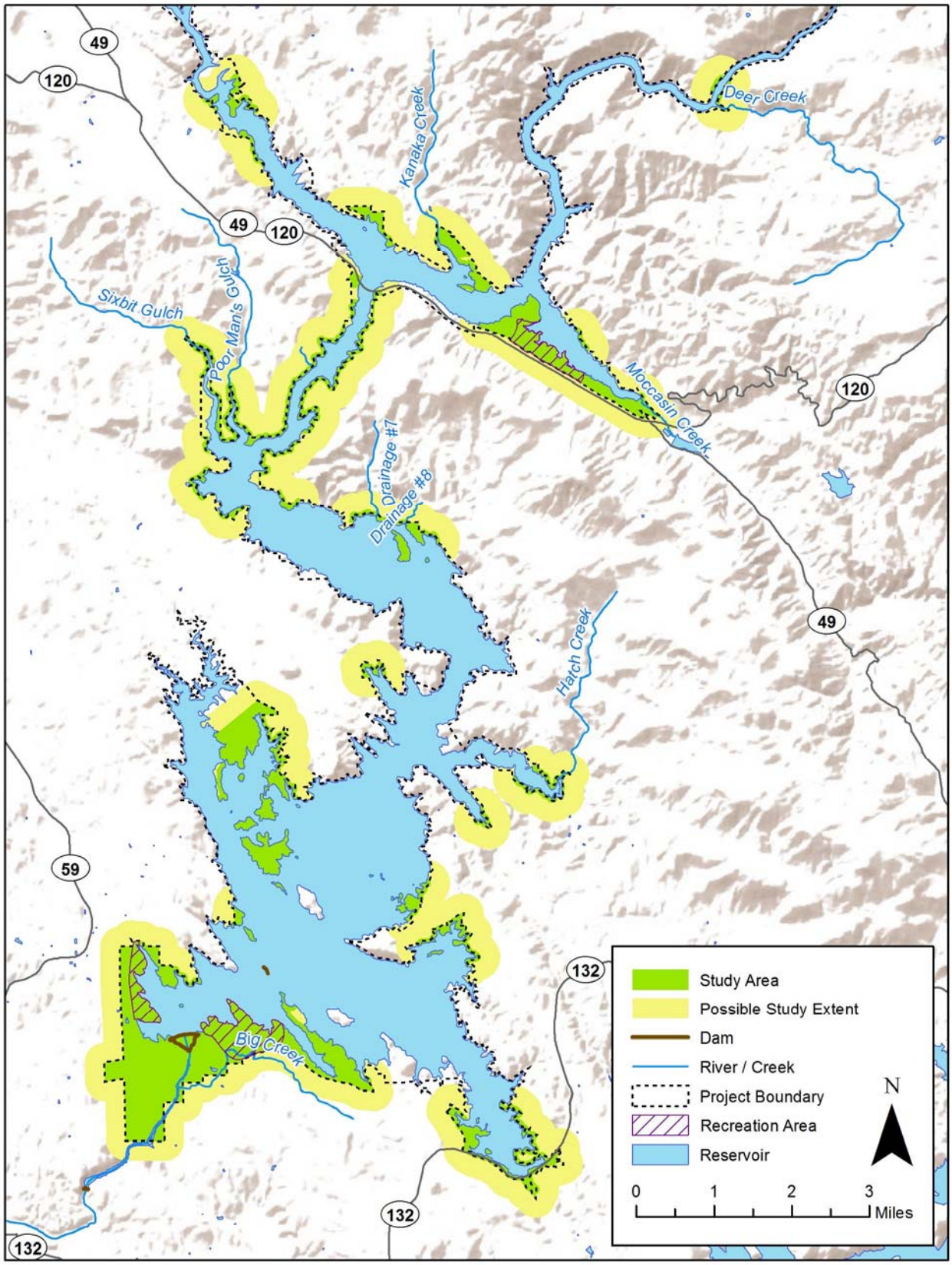

Figure 3.3-1. Special-status plants study area.

4.0 METHODOLOGY

The study was conducted in five steps: (1) define the study area and gather data and information to prepare for the field effort, including known plant occurrences; (2) conduct the surveys for the study area; (3) compile and quality assure/quality control data (QA/QC); (4) consult with Districts' operations staff and recreation personnel to identify Project O&M and recreation, or other Project-related activities, that typically occur in the area of special-status plant occurrences and have the potential to affect these occurrences; and (5) prepare a report on the study.

4.1 Gather Data and Prepare for Field Effort

A literature review was conducted prior to field surveys to: (1) identify potential special-status plants in the study area, and (2) identify locations where special-status plants were previously observed. The Districts: (1) reviewed the California Native Plant Society (CNPS) database (CNPS 2012) within the nine United States Geological Survey (USGS) quadrangle (quad) maps around the FERC Project Boundary; and (2) queried the California Natural Diversity Database (CNDDB) Rarefind 4 (CDFG 2012). Quadrangles containing the Project Boundary include Chinese Camp, La Grange, Moccasin, Penon Blanco Peak, Sonora, and Standard. Based on this information, as well as the Project's elevation range and habitats in this region of the Tuolumne River, the Districts' study plan identified 31 plant species that are considered special-status and may have a reasonable potential to be affected by Project O&M and/or recreation activities.

There were CNDDB records for 28 special-status plant occurrences, comprising seven plant species, located within a one-mile buffer of the Project Boundary. There were nine occurrences of Red Hills onion (*Allium tuolumnense*), six occurrences of Red Hills soaproot (*Chlorogalum grandiflorum*), four occurrences each of Congdon's lomatium (*Lomatium congdonii*) and Red Hills ragwort (*Packera clevelandii*), two occurrences each of shaggyhair lupine (*Lupinus spectabilis*) and Mariposa cryptantha (*Cryptantha mariposae*), and one occurrence of Tuolumne button-celery (*Eryngium pinnatisectum*). Congdon's lomatium, shaggyhair lupine, Red Hills onion, Red Hills ragwort, Red Hills soaproot and Mariposa cryptantha are all BLM-S; Tuolumne button-celery is CNPS-1. The dates on the reports ranged from 1937 to 2007 (CDFG 2012).

A botanical survey of the Red Hills Management Area (now the Red Hills ACEC) was completed in 1984. The surveys located Red Hills onion, Congdon's lomatium, Red Hills soaproot, and Red Hills ragwort (BLM 1985).

Table 4.1-1 provides for each potentially-occurring special-status plant species: (1) status, (2) flowering period, (3) elevation range, (4) habitat requirements, and (5) recorded occurrences in the general Project area.

Table 4.1-1. Special-status plant species potentially occurring in the Don Pedro FERC Project Boundary.

Common Name / Scientific Name	Status[1]	Flowering Period	Elevation Range (feet)	Habitat Requirements	Occurrence in USGS Quads Surrounding Project[2,3]
Henderson's bent grass *Agrostis hendersonii*	CNPS 3	Apr-Jun	200-1,100	Valley and foothill grasslands, vernal pools	New Melones Dam
Jepson's onion *Allium jepsonii*	CNPS 1B BLM-S	Apr-Aug	950-4,500	Chaparral, cismontane woodland, lower montane coniferous forest	**Sonora**, Tuolumne
Three-bracted onion *Allium tribracteatum*	CNPS 1B	Apr-Aug	3,600-10,000	Chaparral, lower montane coniferous forest, upper montane coniferous forest, volcanic soils	Columbia SE, Twain Harte
Red Hills onion *Allium tuolumnense*	CNPS 1B, BLM-S	Mar-May	950-2,000	Cismontane woodland, serpentine	**Sonora, Chinese Camp, Moccasin**
Nissenan manzanita *Arctostaphylos nissenana*	CNPS 1B, BLM-S	Feb-Mar	1,400-3,650	Closed-cone coniferous forest, chaparral	**Sonora**
Big-scale balsamroot *Balsamorhiza macrolepis*	CNPS 1B, BLM-S	Mar-Jun	290-3,500	Chaparral, cismontane woodland valley and foothill grassland, sometimes serpentine	Hornitos
Hoover's calycadenia *Calycadenia hooveri*	CNPS 1B	Jul-Sep	200-1,000	Cismontane woodland, valley and foothill grassland	**La Grange**, Snelling, Merced Falls, Cooperstown, Keystone
Red Hills soaproot *Chlorogalum grandiflorum*	CNPS 1B, BLM-S	May-Jun	800-4,250	Chaparral, cismontane woodland, lower montane coniferous forest, serpentine, gabbroic and other soils	**Chinese Camp, Sonora**, New Melones Dam, Keystone
Small's southern clarkia *Clarkia australis*	CNPS 1B	May-Aug	2,600-6,900	Cismontane woodland, lower montane coniferous forest	Tuolumne, Twain Harte, Coulterville, Hornitos
Mariposa clarkia *Clarkia biloba* ssp. *australis*	CNPS 1B, BLM-S	May-Jul	1,000-3,500	Chaparral, cismontane woodland, serpentine	**Sonora**, Tuolumne, Twain Harte, Coulterville, Hornitos
Beaked clarkia *Clarkia rostrata*	CNPS 1B, BLM-S	Apr-May	190-1,700	Cismontane woodland, valley and foothill grassland	**Penon Blanco Peak, Moccasin**, New Melones Dam, Cooperstown, Snelling, Merced Falls, Coulterville, Hornitos
Hoover's cryptantha *Cryptantha hooveri*	CNPS 1A	Apr-May	0-500	Inland dunes, valley and foothill grassland	Cooperstown
Mariposa cryptantha *Cryptantha mariposae*	CNPS 1B, BLM-S	Apr-Jun	600-2,200	Chaparral, serpentine	**La Grange, Chinese Camp**, **Sonora**, Keystone, Coulterville, Hornitos
Dwarf downingia *Downingia pusilla*	CNPS 2	Mar-May	0-1,500	Valley and foothill grassland, vernal pools	**La Grange**, Cooperstown, Snelling, Merced Falls

Common Name / Scientific Name	Status[1]	Flowering Period	Elevation Range (feet)	Habitat Requirements	Occurrence in USGS Quads Surrounding Project[2,3]
Tuolumne button-celery *Eryngium pinnatisectum*	CNPS 1B	May-Aug	700-10,000	Cismontane woodland, lower montane coniferous forest, vernal pools, mesic	**Standard, Sonora, Chinese Camp, Moccasin**, New Melones Dam, Columbia
Spiny-sepaled button-celery *Eryngium spinosepalum*	CNPS 1B	Apr-May	250-900	Valley and foothill grassland, vernal pools	**La Grange**, New Melones Dam, Snelling, Merced Falls
Tuolumne fawn lily *Erythronium tuolumnense*	CNPS 1B, BLM-S	Mar-Jun	1,600-4,200	Broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest	**Standard**, Columbia, Columbia SE, Tuolumne, Twain Harte
Delicate bluecup *Githopsis tenella*	CNPS 1B	May-Jun	3,500-6,500	Chaparral, cismontane woodland	**Chinese Camp**
Bisbee Peak rush-rose *Helianthemum suffrutescens*	CNPS 3	Apr-Jun	100-2,800	Chaparral, often serpentine, gabbroic or Ione soils	**Sonora**
Parry's horkelia *Horkelia parryi*	CNPS 1B, BLM-S	Apr-Sep	250-3,500	Chaparral, cismontane woodland, Ione formation	Coulterville
Tuolumne iris *Iris hartwegii* ssp. *columbiana*	CNPS 1B	May-Jun	1,200-4,700	Cismontane woodland, lower montane coniferous forest	Columbia, Columbia SE
Knotted rush *Juncus nodosus*	CNPS 2	Jul-Sep	0-6,600	Meadows, seeps, marshes, swamps	**La Grange**, Cooperstown
Congdon's lomatium *Lomatium congdonii*	CNPS 1B, BLM-S	Mar-Jun	900-7,000	Chaparral, cismontane woodland, serpentine	**Sonora, Chinese Camp, Moccasin**, New Melones Dam, Keystone
Stebbins' lomatium *Lomatium stebbinsii*	CNPS 1B	Mar-May	4,000-6,500	Chaparral, lower montane coniferous forest, gravelly, volcanic clay	Twain Harte
Shaggyhair lupine *Lupinus spectabilis*	CNPS 1B, BLM-S	Apr-May	800-2,800	Chaparral, cismontane woodland, serpentine	**Sonora, Moccasin**, New Melones Dam, Groveland, Coulterville, Hornitos
Slender-stemmed monkeyflower *Mimulus filicaulis*	CNPS 1B, BLM-S	Apr-Aug	2,800-6,000	Cismontane woodland, lower montane coniferous forest, meadows and seeps, upper montane coniferous forest, vernally mesic	Groveland
Pansy-faced monkeyflower *Mimulus pulchellus*	CNPS 1B	Apr-Jul	1,900-6,700	Lower montane coniferous forest, meadows and seeps, vernally mesic, often disturbed areas	**Standard**, Angels Camp, Groveland, Twain Harte
Veiny monardella *Monardella venosa*	CNPS 1B	May-Jul	150-1,500	Cismontane woodland, valley and foothill grassland, heavy clay	New Melones Dam

Common Name / Scientific Name	Status[1]	Flowering Period	Elevation Range (feet)	Habitat Requirements	Occurrence in USGS Quads Surrounding Project[2,3]
Merced monardella *Monardella leucocephala*	CNPS 1A	May-Aug	100-500	Valley and foothill grassland	**La Grange**, Cooperstown
Red Hills ragwort *Packera clevelandii*	CNPS 1B, BLM-S	Jun-Jul	800-1,400	Cismontane woodland, serpentine seeps	**Chinese Camp**, Moccasin

[1] Special-status:
BLM-S = Bureau of Land Management Sensitive Plant Species
CNPS 1A = California Native Plant Society list presumed extinct in California
CNPS 1B = California Native Plant Society list endangered in California and elsewhere
CNPS 2 = California Native Plant Society list rare/threatened/endangered in California only
CNPS 3 = California Native Plant Society list plants requiring further information

[2] Occurrence in area surrounding Project was based on a nine-quad CNPS quadrangle search.

[3] Quads that are fully or partially included within the Project Boundary are indicated by bold font; quads surrounding, but not included within the Project Boundary are listed in regular font.

[4] According to the Jepson Online Interchange[3], *Senecio clevelandii* var. *heterophyllus* has been combined with *S. c.* var. *clevelandii* and renamed *Packera clevelandii*

[3] http://ucjeps.berkeley.edu/interchange/I_index_supplant.html

4.2 Botanical Surveys

Botanical surveys were performed on approximately 3,870 ac (6.0 square mi) between March 5 and June 29, 2012. Special-status plant surveys were conducted in conjunction with other relicensing studies including ESA- and CESA-listed Plants (Study TR-02); Noxious Weeds (Study TR-04); and ESA-listed Wildlife – Valley Elderberry Longhorn Beetle (Study TR-05). Results of these surveys are discussed in Study Report TR-02, ESA- and CESA-listed Plants; Study Report TR-04, Noxious Weeds; and Study Report TR-05, ESA-Listed Wildlife - Valley Elderberry Longhorn Beetle (TID/MID 2013). Surveys were carried out by qualified botanists on foot and by boat and coincided with blooming periods. Resurveys were conducted at areas and features where potential special-status plant species or plant communities were not at the correct phenology for proper identification during the earlier bloom period, particularly in areas containing late blooming species.

Surveys were floristic in nature and generally followed CDFG's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009). Plants were identified using the *Jepson Manual of Higher Plants of California* (Baldwin *et al.* 2012), *A field guide to Pacific States wildflowers: Washington, Oregon, California, and adjacent areas* (Niehaus and Ripper 1976), *Trees and shrubs of California* (Stuart and Sawyer, 2001), *Wildflowers of the Sierra Nevada and the Central Valley* (Blackwell, 1999), *Field Guide to the Sedges of the Pacific Northwest* (Wilson *et al*. 2008) and *Selected Plants of Northern California and Adjacent Nevada* (Oswald 2002).

As detailed in the FERC-approved study plan, surveys were conducted using a random meander technique with additional focus in high quality habitat or other areas with a higher probability of supporting special-status plants.

At each special-status plant occurrence, the following information was recorded: digital photograph; estimated area covered by the population; estimated number of individuals; boundary or location of the approximate center of the population; dominant and subdominant vegetation in the area; topographic features; estimated distance to nearest Project facility, feature, or Project-related activity; activities observed in the vicinity of the population that have a potential to adversely affect the population; and estimated phenology and descriptions of reproductive state.

Special-status plant occurrence locations were recorded using a Trimble GeoXT Global Positioning System (GPS) receiver. A single, central point was recorded for each occurrence that was smaller than 0.1 ac. GPS was used to delineate a polygon for occurrences greater than 0.1 ac for most species. Many Mariposa clarkia and beaked clarkia occurrences were large. Due to the frequency and large size of these occurrences, populations were drawn onto aerial field maps, and locations were recorded for population boundary extent. The maps were digitized and populations converted into polygons.

All data were subjected to QA/QC procedures including, but not limited to: daily QA/QC of field data sheets, spot-checks of transcription during data compilation, and comparison of Geographic Information System (GIS) maps with field notes and field maps to verify locations. Data were

entered into a database and crosschecked by a second scientist to ensure data were properly recorded. Maps depicting the occurrences, Project facilities, and features were generated using GIS to display field-collected location information and used as a second method to verify that all special-status plant occurrence locations matched the information on the data sheets. Any data corrections were noted in the Project file.

4.3 Consultation with Project O&M Staff

After all observed special-status plant occurrences were verified and mapped, Project operations staff was consulted to identify Project O&M and Project-related activities that typically occur in the area of the special-status plant occurrences that have a potential to adversely affect the occurrences.

5.0 RESULTS

The Districts' surveys identified over 700 vascular plant species and eight special-status plants. A complete list of all plant species found is included in Attachment A. Figures depicting the locations of each special-status plant occurrence are provided in Attachment B.

5.1 Special-Status Plants

The Districts recorded a total of 85 occurrences (i.e., either a single plant or a distinct geographic population of plants) of eight different special-status plants, all listed as BLM-S: 57 occurrences on public land administered by the BLM, and 28 occurrences on land owned by the Districts. Table 5.1-1 summarizes the 85 special-status plant occurrences by land ownership.

Seven special-status plant occurrences were found within previously recorded CNDDB special-status plant populations of the same species, and three occurrences were found adjacent to or near a CNDDB recorded area of the same species. These included four occurrences of Red Hills onion (occurrence numbers 644, 646, 658, 665[4]) within the area of CNDDB 14336, two Red Hills soaproot (639, 663) within CNDDB 13325, and one occurrence of Red Hills ragwort (645) within CNDDB 3859. One occurrence of Red Hills onion (88) was found adjacent to CNDDB 3974, and two Congdon's lomatium were found near CNDDB 13982. Additionally, two previously-recorded CNDDB occurrences documented in the study area were not located on the Project. These included a CNDDB record of shaggyhair lupine (60739) from 1937, and a more recent record of Red Hills soaproot (50965).

The most abundant special-status plants were Mariposa clarkia (25 occurrences), Red Hills soaproot (20 occurrences), and Mariposa cryptantha (10 occurrences). A number of serpentine-adapted species were found in the Red Hills ACEC, included Red Hills onion (10 occurrences), Congdon's lomatium (seven occurrences), shaggy-haired lupine (seven occurrences), tripod buckwheat (four occurrences), and Red Hills ragwort (two occurrences).

Specific descriptions of the locations where special-status plants were found are summarized in Sections 5.1.1 through 5.1.8 and described in Attachments B and C.

Table 5.1-1. Special-status plant species identified in the study area.

Common Name/Scientific Name	Status[1]	Number of Occurrences by Land Owner	
		Public (BLM)	TID/MID
Red Hills onion *Allium tuolumnense*	BLM-S, CNPS 1B	10	--
Red Hills soaproot *Chlorogalum grandiflorum*	BLM-S, CNPS 1B	20	--
Mariposa clarkia *Clarkia biloba* ssp. *australis*	BLM-S, CNPS 1B	2	23
Mariposa cryptantha *Cryptantha mariposae*	BLM-S, CNPS 1B	9	1
Tripod buckwheat *Eriogonum tripodum*	BLM-S	4	--

[4] Occurrence numbers are not sequential; details on each are provided in Attachments B and C.

Common Name/Scientific Name	Status[1]	Number of Occurrences by Land Owner	
		Public (BLM)	TID/MID
Congdon's lomatium *Lomatium congdonii*	BLM-S, CNPS 1B	7	--
Shaggyhair lupine *Lupinus spectabilis*	BLM-S, CNPS 1B	4	3
Red Hills ragwort *Packera clevelandii*	BLM-S, CNPS 1B	1	1
	Total Occurrences	**57**	**28**

[1] Special-status:
BLM-S = Bureau of Land Management Sensitive Plants
CNPS 1A = California Native Plant Society list presumed extinct in California
CNPS 1B = California Native Plant Society list endangered in California and elsewhere
CNPS 2 = California Native Plant Society list rare/threatened/endangered in California only
CNPS 3 = California Native Plant Society list plants requiring further information

5.1.1 Red Hills onion (BLM-S, CNPS 1B)

Red Hills onion is a perennial herb that grows only on serpentine soils within the Red Hills. One plant can have up to 60 white to pink flowers, which bloom between March and May (BLM 2010d).

The Districts located 10 occurrences of Red Hills onion within the study area, all on public land administered by BLM. Six occurrences were located on Sixbit Gulch, two on Kanaka Point, one near Moccasin Point Recreation Area and one on Poor Man's Gulch. Over 700 individuals were located over a combined acreage of 0.30. The majority of the plants were in flower or fruit. Associated plant species included gray pine (*Pinus sabiniana*), buckbrush (*Ceanothus cuneatus*) and annual grasses. Potential disturbances around occurrences included noxious weeds and grazing; additionally, parts of some occurrences were below the reservoir high water mark. Other ESA-listed and special-status plants were located with Red Hills onion occurrences, including Layne's ragwort (*Packera layneae*), Congdon's lomatium, Red Hills soaproot, tripod buckwheat, shaggyhair lupine and Mariposa cryptantha. Attachment C lists occurrence information for Red Hills onion; Attachment B provides locations within the study area. Figures 1 and 2 in Attachment D are representative photos of the plant and its characteristic habitat in the study area.

5.1.2 Red Hills soaproot (BLM-S, CNPS 1B)

Red Hills soaproot is a perennial herb that grows on serpentine and gabbro in Tuolumne and El Dorado counties. This plant blooms between May and June and generally grows in chaparral (BLM 2010f).

The Districts located 20 occurrences of Red Hills soaproot within the study area, all on public land administered by BLM. Twelve occurrences were located on Sixbit Gulch and eight on Poor Man's Gulch. Over 1,600 individuals were located on a combined area of over 0.35 ac. Red

Hills soaproot occurred primarily in chamise and buckbrush chaparral and foothill gray pine woodland. Other associated species include California melicgrass (*Melica californica*), manyflowered brodiaea (*Dichelostemma multiflorum*), false brome (*Brachypodium distachyon*) and common lomatium (*Lomatium utriculatum*). The majority of the plants were in vegetative form, but approximately 20% were in bloom. Potential disturbances around occurrences included noxious weeds and grazing. Other ESA-listed and special-status plants were located with Red Hills soaproot occurrences, including Layne's ragwort, Red Hills onion, Congdon's lomatium, tripod buckwheat, shaggy-haired lupine and Mariposa cryptantha. Attachment C lists occurrence information for Red Hills soaproot; Attachment B provides locations within the study area. Figures 3 and 4 in Attachment D are representative photos of the plant and its characteristic habitat in the study area.

5.1.3 Mariposa clarkia (BLM-S, CNPS 1B)

Mariposa clarkia is an annual herb that grows in chaparral and foothill woodlands, sometimes associated with serpentine soils. This species is known only from Mariposa County and grows principally in the Merced River drainage, below 2,700 ft in elevation. Mariposa clarkia blooms from May to July and has bilobed petals that are bright pink to magenta in color (BLM 2010b).

The Districts located 25 occurrences of Mariposa clarkia; two on public land administered by BLM. Occurrences were located in the Moccasin Point Recreation Area, Rogers Creek Arm, near the Moccasin transmission line and on Shawmut Road. This plant had not been documented previously within a one-mile buffer of the FERC Project Boundary. Over 35,000 individual plants were found, and the estimated area of the combined occurrences is almost 0.07 ac. Associated plant species included blue oak, gray pine, buckbrush, poison oak, and annual grasses. The majority of individuals in the occurrences were in flower. Potential disturbances around occurrences included recreation, noxious weeds, grazing, trash dumping and road and transmission line maintenance. Additionally, parts of some occurrences were below the reservoir high water mark. Other special-status plants were located with Mariposa clarkia occurrences, including Red Hills onion. Attachment C lists occurrence information for Mariposa clarkia; Attachment B provides locations within the study area. Figures 5 and 6 in Attachment D are representative photos of the plant and its characteristic habitat in the study area.

5.1.4 Mariposa cryptantha (BLM-S, CNPS 1B)

Mariposa cryptantha is an annual herb that grows in serpentine soils at elevations between 600 and 2,200 ft. This species blooms in April and June (BLM 2010c).

The Districts located 10 occurrences of Mariposa cryptantha on Kanaka Point, Moccasin Point Recreation Area, Railroad Canyon and Sixbit Gulch. Approximately 2,300 plants were found with an estimated area of 1.24 ac, with all occurrences on BLM lands and one extending onto TID/MID lands. The Mariposa cryptantha occurrences were scattered on rocky, serpentine slopes amidst grassy openings of toyon (*Heteromeles arbutifolia*), chamise and gray pine. The majority of the plants were either in flower or fruit, with a small percentage still vegetative. The Mariposa cryptantha occurrence in Moccasin Point Recreation Area was growing in the middle of a storage area for old equipment and vehicles, sometimes growing around equipment. Potential disturbances around the other occurrences included noxious weeds and recreation. Attachment C lists occurrence information for Mariposa cryptantha; Attachment B provides the locations within the study area. Figures 7 and 8 in Attachment D are representative photos of the plant and its characteristic habitat in the study area.

5.1.5 Tripod buckwheat (BLM-S)

Tripod buckwheat is a small shrub that grows in serpentine chaparral and cismontane woodlands in the Sierra Nevada foothills and Inner Coast ranges. This species blooms from May through July (University of California 2012).

The Districts located four occurrences of tripod buckwheat; all on public land administered by the BLM in Sixbit Gulch. This plant had not been documented previously within a one-mile buffer of the FERC Project Boundary. Approximately 277 individual plants were located on a total estimated 0.069 ac. Tripod buckwheat was located on rocky slopes in openings of gray pine and chaparral habitats, sometimes just above the high water mark. Nearly 100 percent of all plants were in flower. Potential disturbances near the occurrences included noxious Other ESA-listed and special-status plants were located with tripod buckwheat occurrences, including Layne's ragwort, Red Hills onion, Congdon's lomatium, shaggy-haired lupine and Red Hills soaproot. Attachment C lists occurrence information for tripod buckwheat; Attachment B provides locations within the study area. Figures 9 and 10 in Attachment D are representative photos of the plant and its characteristic habitat in the study area.

5.1.6 Congdon's lomatium (BLM-S, CNPS 1B)

Congdon's lomatium is a perennial herb with small flowers of pale yellow in peduncles. It is known to occur only on serpentine soils in Tuolumne County, primarily in the Red Hills. It grows in chaparral and foothill woodland and blooms from April through June (BLM 2010a).

The Districts located seven occurrences of Congdon's lomatium, all on public land administered by the BLM. Five occurrences were located on Sixbit Gulch, while the other two were on Poor Man's Gulch. An estimated 80 percent of the plants were in fruit, and the remaining plants were in flower. Visible disturbances around occurrences included inundation by high water, recreation and weeds. Other ESA-listed and special-status plants were located with Congdon's lomatium occurrences, including Layne's ragwort, Red Hills onion, Red Hills soaproot, tripod buckwheat, shaggy-haired lupine and Mariposa cryptantha. Attachment C lists occurrence information for Congdon's lomatium; Attachment B provides the location within the study area. Figures 11 and 12 in Attachment D are representative photos of the plant and its characteristic habitat in the study area.

5.1.7 Shaggy-haired lupine (BLM-S, CNPS 1B.2)

Shaggy-haired lupine is an annual herb, covered with dense, long-spreading hairs, that grows on exposed serpentine rock. This species has been found only in Mariposa and Tuolumne counties and grows below 2,800 ft. Shaggyhair lupine blooms in April and May (BLM 2010g).

The Districts located seven occurrences of shaggy-haired lupine, four on public land administered by BLM. Two were in Poor Man's Gulch, while the other five occurrences were surveyed in Railroad Canyon. Occurrences ranged from 1 to 2,000 plants, with a combined estimated area of 0.25 ac. Shaggyhair lupine were found in rocky, serpentine openings of gray pine and chaparral. Commonly associated plant species included toyon, chamise, floriferous monkeyflower (*Mimulus floribundus*) and annual grasses. Over 90 percent of the individuals were in fruit, with the rest in flower. All occurrences, except 683, were located just above or partially below the high water mark of the reservoir. Other ESA-listed and special-status plants were located with shaggyhair lupine occurrences, including Layne's ragwort, Red Hills onion, Red Hills soaproot, tripod buckwheat, and Congdon's lomatium. Attachment C lists occurrence information for shaggy-haired lupine; Attachment B provides locations within the study area. Figures 13 and 14 in Attachment D are representative photos of the plant and its characteristic habitat in the study area.

5.1.8 Red Hills ragwort (BLM-S, CNPS 1B)

Red Hills ragwort is a perennial herb, which grows in wet serpentine areas. This species grows in an elevation range of 800 to 1,400 ft and blooms in June and July (BLM 2010e).

The Districts located two occurrences of Red Hills ragwort; one on BLM lands. Red Hills ragwort was found at Recreation Bay and Sixbit Gulch, in riparian areas with Pacific willow (*Salix lasiandra*), California buckthorn (*Frangula californica* ssp. *tomentella*), cobwebby hedgenettle (*Stachys albens*), seep monkeyflower (*Mimulus guttatus*) and needle spikerush (*Eleocharis acicularis*). The estimated area of the combined occurrences is 0.02 ac, containing approximately 268 individuals. An estimated 65 percent of the occurrences were in flower, and the remaining plants were vegetative. Potential disturbances near the occurrence in Recreation Bay included recreation, weeds and grazing. Other special-status plants were located with Red Hills ragwort occurrences, including Red Hills soaproot, and shaggy-haired lupine. Attachment C lists occurrence information for Red Hills ragwort; Attachment B provides locations within the study area. Figures 15 and 16 in Attachment D are representative photos of the plant and its characteristic habitat in the study area.

5.2 Terrestrial Vegetation Types

The botanical communities within the study area included primarily upland vegetation alliances, with minimal areas of wetland, riparian, or littoral habitats. The Project study area was comprised of tree-dominated, shrub-dominated or grass-dominated communities. Vegetation types described below are based on CALVEG systems (USFS 2009), as identified in the PAD, and reflect the habitats observed during field surveys.

The study area was dominated by three vegetation alliances: Blue Oak, Chamise and Annual Grasses and Forbs. There were also large areas of Gray Pine, and smaller inclusions of Lower Montane Mixed Chaparral and Interior Live Oak.

The shoreline of Don Pedro Reservoir is predominantly Blue Oak and Annual Grasses and Forbs. Willow Creek Arm, Hatch Creek Arm, and Don Pedro Bar are dominated by Chamise. The Tuolumne Arm and Wood's Creek Arm support a mixture of alliances, including Lower Montane Mixed Chaparral, Chamise, Interior Live Oak, Gray Pine, Annual Grasses and Forbs and a few small areas of Riparian Mixed Hardwoods.

5.3 Project Operation and Maintenance and Recreation Activities

Consistent with the FERC-approved study plan, the Districts' operations staff was consulted with to identify specific Project O&M activities and recreation that typically occur in the area of, and have the potential to affect, special-status plant occurrences. In addition, observations of

disturbances in or near special-status plant occurrences were recorded in the field. Information gathered from consultation and from field observations is summarized in Table 5.3-1.

Certain special-status plant occurrences were specifically noted to be in areas affected by Project O&M, including:

- Below the reservoir maximum inundation line - Red Hills onion 644, 646; tripod buckwheat 643; Congdon's lomatium 642; shaggy-haired lupine 633, 668; Red Hills ragwort 645.
- Burn pile - Mariposa clarkia 84.
- Road maintenance - Red Hills onion 88; Mariposa clarkia 92, 369, 373, 378, 385-6.
- Within waste or storage area - Mariposa cryptantha 86.
- Within recreation areas or places of dispersed recreation: Red Hills onion 676, 678; Mariposa clarkia 83, 391; Mariposa cryptantha 72, 73.

Additional special-status plant occurrences were in areas potentially affected by non-Project uses, such as:

- Dumping - Mariposa clarkia 377.
- Transmission line maintenance - Mariposa clarkia 92, 385-6.
- Management and use of public roads: Mariposa clarkia 375, 376, 385, 392.

Table 5.3-1. Project O&M, recreation, and non-Project activities in areas with special-status plant occurrences.

Location Description	Species (common name)	Occurrence Number	Activities with Potential to Affect Special-status Plants		
			O&M	Recreation Use	Non-Project Use
Moccasin Point Recreation Area and surroundings	Mariposa clarkia	83, 84, 89	Campsites, structures and roadsides (up to 6-10 ft adjacent to roads and turnouts) are sprayed with herbicides annually (generally Roundup, Goaltender and Milestone) after first soaking rain in the fall.	Recreation is heaviest during high water years in the summer months. Campsites are full usually only on holidays and weekends. Walk-in use area is used heavily year-round to access the reservoir.	Hetch Hetchy facility and housing in area maintained by Hetch Hetchy.
	Mariposa cryptantha	87	Campgrounds and associated roads are also mechanically mowed/weed-eaten.	Grizzly Road area used heavily for day use off end of cul-de-sac.	
	Red Hills onion	88	Prescribed burns of vegetation directly in and around developed camping areas is a potential vegetation management tool, but is seldom used.		Grizzly Road maintained by county.
Railroad Canyon	Mariposa cryptantha	684, 686, 687, 689, 690	Some plants occur below reservoir maximum inundation line.	Heavy boat use year round but not much land use in area.	--
	Shaggyhair lupine	679, 680, 681, 682, 683			
Moccasin transmission line and Recreation Bay area	Red Hills ragwort	83	--	Shoreline house boating and sporadic day use off the reservoir.	Hetch Hetchy maintains the transmission line and access roads in the area.
	Mariposa clarkia	92			Grazing.
Shawmut Road	Mariposa clarkia	391, 392	--	This area is open for free day use. No camping. Fairly heavy use, particularly during summer months.	Road maintained by county.

Location Description	Species (common name)	Occurrence Number	Activities with Potential to Affect Special-status Plants		
			O&M	Recreation Use	Non-Project Use
Kanaka Point, Jacksonville Road, Harney Lane and surroundings	Red Hills onion	676, 678	Mow edge of access road to 6-10 feet off the side to limit fire hazard.	Popular, free area for day-use, particularly fishing. People hike in both directions from Kanaka Point parking area to access the reservoir.	Kanaka Point access road maintained by county on infrequent basis.
	Mariposa cryptantha	71, 72, 73	Area graded within Kanaka Point for one-time removal of debris left after flood; evidence of disturbance remains.		
Sixbit & Poor Man's Gulch	Congdon's lomatium	623, 642, 649, 651, 655, 673, 699	--	Light boating use, primarily fishing.	Grazing.
	Red Hills ragwort	645			
	Red Hills onion	620, 635, 644, 646, 658, 665, 670			
	Red Hills soaproot	622, 627, 629, 637, 639, 650, 652, 653, 657, 660, 661, 663, 666, 669, 674, 692, 694, 695, 697, 698		Some recreation from upslope, particularly horse riding.	
	Tripod buckwheat	643, 662, 664, 667	--	--	--
	Mariposa cryptantha	671			
	Shaggyhair lupine	633, 668			
Rogers Creek Arm	Mariposa clarkia	368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386	Occasional use of the old access road.	Heaviest day use area, particularly during the summer weekends and holidays. Walk-in access near the area of pullouts along the road.	Fencing and grazing throughout area.
					Dumping off the side of the road.

6.0 DISCUSSION AND FINDINGS

Botanical surveys were performed on approximately 3,870 ac (6.0 square mi) between March 5 and June 29, 2012. Surveys were performed by several teams of botanists, working simultaneously throughout the study area. More than 700 plant species were found during floristic surveys and, of those, eight special-status species were observed and mapped in a total of 85 occurrences.

All eight species met the BLM-S definition of special-status plant. Fifty-seven occurrences of these species are located on public lands administered by the BLM and are considered special-status by the BLM. BLM-S plants on public lands administered by the BLM are actively managed by the BLM.

Two species of special-status plants, Mariposa clarkia and tripod buckwheat, had not been documented, prior to these surveys, within a one-mile radius of the FERC Project Boundary.

FERC's Scoping Document 2 identified the following issues potentially affecting special-status plant species:

- Potential effects of Project operation, including water level fluctuations, ground-disturbing activities, and maintenance on special-status plant species and botanical resources.
- Effects of maintenance and use of Project recreation facilities by recreationists on special-status wildlife species, special-status plant species and botanical resources, and shoreline vegetation.

Don Pedro Project O&M includes normal operations within the currently licensed elevation range (up to 830 feet), as well as operation of three formal recreation areas (Moccasin Point, Blue Oaks, and Fleming Meadows), vegetation management within these recreation areas and Project facilities, and ongoing reservoir debris removal and disposal near Deer Creek and Harney Lane. Recreation activities occur along portions of the shoreline and include dispersed camping, fishing and hiking. Additionally, the Districts have granted four grazing permits on a limited area within the Project Boundary, on a total of 559 acres.

Grazing and noxious weeds are the largest causes of potential stress for special-status plants in the study area. Lands with substantial grazing were observed to have some of the highest concentrations of noxious weed occurrences. Over half of the observed occurrences of special-status plants were colocated with noxious weed occurrences, many of these in areas with evidence of disturbance from grazing. However, none of these special-status plant occurrences are in or near lands associated with the Districts' four grazing permits. As a result, this study finds that the Districts' permitted grazing does not affect special-status plants within the study area.

Project operations and recreation may have the potential to affect special-status plant species located within the study area. Portions of seven special-status plant occurrences of five species are located near or below the reservoir maximum inundation line; these portions represent the

outside boundary of the occurrence. These plants are not adversely affected by current operations, but could be affected by substantial changes in the duration or timing of inundation. Project-related maintenance located within or around special-status plants included road maintenance, sewage pond and storage areas and a burn pile. Activities associated with this maintenance that extend into the special-status plant occurrences can stress or directly disturb individual special-status plants or the entire occurrence, as well as impact them indirectly by promoting noxious weeds and disturbing habitat. Additionally, numerous occurrences of special-status plants were located in areas where they could be directly impacted by recreation, primarily through trampling, soil disturbance and the spread of noxious weeds.

Non-Project uses of Project lands may also affect special-status plants, including frequently observed activities such as dumping, transmission line maintenance, and grazing. In addition, non-Project lands were frequently observed to support untreated source occurrences of noxious weeds that extend into the study area.

7.0 STUDY VARIANCES AND MODIFICATIONS

This study was conducted in conformance to the FERC-approved Special-Status Plants Study Plan (Study TR-01); no variances occurred.

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