

**DON PEDRO HYDROELECTRIC PROJECT  
FERC NO. 2299**

**FINAL LICENSE APPLICATION**

**EXHIBIT E – ENVIRONMENTAL REPORT**

**APPENDIX E-1  
DRAFT VEGETATION MANAGEMENT PLAN**



Prepared by:  
Turlock Irrigation District  
P.O. Box 949  
Turlock, CA 95381

and

Modesto Irrigation District  
P.O. Box 4060  
Modesto, CA 95352

April 2014

## TABLE OF CONTENTS

Section No.	Description	Page No.
<b>PREFACE</b> .....		<b>1-1</b>
<b>1.0 INTRODUCTION</b> .....		<b>1-1</b>
1.1	General Description of the Don Pedro Project .....	1-2
1.2	General Description of Current Vegetation Management Activities.....	1-4
<b>2.0 NOXIOUS WEEDS</b> .....		<b>2-1</b>
2.1	Best Management Practices .....	2-1
2.2	Noxious Weed Surveys.....	2-1
2.3	Noxious Weed Management Guidelines .....	2-2
2.4	Management of Existing Occurrences .....	2-3
<b>3.0 SPECIAL-STATUS PLANTS</b> .....		<b>3-1</b>
3.1	Special-status Plant Monitoring.....	3-1
3.2	Special-status Plant Protection.....	3-1
<b>4.0 VELB HOST PLANT GUIDELINES</b> .....		<b>4-1</b>
<b>5.0 BIENNIAL ACTIVITIES AND CONSULTATION</b> .....		<b>5-1</b>
5.1	Employee and Contractor Training.....	5-1
5.2	Agency Consultation.....	5-1
5.3	List Review .....	5-1

Table No.	List of Tables Description	Page No.
Table 2.3-1.	Noxious weed management guidelines for the Don Pedro Project.....	2-2
Table 2.4-1.	Class A and B noxious weed occurrences known from lands addressed by the Draft Vegetation Management Plan.....	2-3
Table 3.2-1.	Special-status plant occurrences with the potential to be directly affected by Don Pedro Project activities.....	3-2

Figure No.	List of Figures Description	Page No.
Figure 1.1-1.	Don Pedro Project site location map.....	1-3

Attachment	List of Attachments Description
Attachment A	BLM Manual Handbook-1745-1, Use of Native Plant Materials in California
Attachment B	Conservation Guidelines for the Valley Elderberry Longhorn Beetle

## List of Acronyms

---

ac .....	acres
ACEC .....	Area of Critical Environmental Concern
ACHP .....	Advisory Council for Historic Preservation
ACOE .....	U.S. Army Corps of Engineers
ADA .....	Americans with Disabilities Act (ADA/ABAAG)
AF .....	acre-feet
AGS .....	Annual Grasslands
ALJ .....	Administrative Law Judge
APE .....	Area of Potential Effect
APEA .....	Applicant-Prepared Environmental Assessment
ARMR .....	Archaeological Resource Management Report
AWQC .....	Ambient Water Quality Criteria
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
BOW .....	Blue Oak Woodland
°C .....	celsius
CalCOFI .....	California Cooperative Oceanic Fisheries Investigations
CalEPPC .....	California Exotic Pest Plant Council
CalSPA .....	California Sportfishing Protection Alliance
CAS .....	California Academy of Sciences
CBDA .....	California Bay-Delta Authority
CCC .....	Criterion Continuous Concentrations
CCIC .....	Central California Information Center
CCSF .....	City and County of San Francisco
CD .....	Compact Disc
CDBW .....	California Department of Boating and Waterways

CDEC.....	California Data Exchange Center
CESA .....	California Endangered Species Act
CDFA.....	California Department of Food and Agriculture
CDFG.....	California Department of Fish and Game (as of January 2013, CDFW)
CDFW .....	California 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
CEC.....	California Energy Commission
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
cm.....	centimeters
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
CPUC .....	California Public Utilities Commission
CPUE .....	Catch Per Unit Effort
CRAM.....	California Rapid Assessment Method
CRC.....	Chamise-Redshank Chaparral
CRLF.....	California Red-Legged Frog
CRRF .....	California Rivers Restoration Fund
CSAS.....	Central Sierra Audubon Society
CSBP.....	California Stream Bioassessment Procedure

CSU.....	California State University
CT .....	California Threatened Species
CTR.....	California Toxics Rule
CTS .....	California Tiger Salamander
CVP.....	Central Valley Project
CVRWQCB .....	Central Valley Regional Water Quality Control Board
CWA .....	Clean Water Act
CWD .....	Chowchilla Water District
CWHR.....	California Wildlife Habitat Relationship
CZMA .....	Coastal Zone Management Act
DDT .....	dichlorodiphenyltrichloroethane
Districts .....	Turlock Irrigation District and Modesto Irrigation District
DLA .....	Draft License Application
DO.....	Dissolved Oxygen
DOI .....	Department of Interior
DPRA.....	Don Pedro Recreation Agency
DPS .....	Distinct Population Segment
DSE.....	Chief Dam Safety Engineer
EA .....	Environmental Assessment
EBMUD .....	East Bay Municipal Utilities District
EC .....	Electrical Conductivity
EFH.....	Essential Fish Habitat
EIR .....	Environmental Impact Report
EIS.....	Environmental Impact Statement
Elev or el .....	Elevation
ENSO .....	El Niño Southern Oscillation
EPA.....	U.S. Environmental Protection Agency
ESA.....	Federal Endangered Species Act
ESRCD.....	East Stanislaus Resource Conservation District
ESU .....	Evolutionary Significant Unit
EVC.....	Existing Visual Condition
EWUA.....	Effective Weighted Useable Area
°F.....	fahrenheit

FERC.....	Federal Energy Regulatory Commission
FFS .....	Foothills Fault System
FL .....	Fork length
FLA .....	Final License Application
FMP.....	Fishery Management Plan
FMU .....	Fire Management Unit
FOT .....	Friends of the Tuolumne
FPA .....	Federal Power Act
FPC .....	Federal Power Commission
FPPA .....	Federal Plant Protection Act
ft .....	feet
ft/mi.....	feet per mile
FWCA .....	Fish and Wildlife Coordination Act
FWUA.....	Friant Water Users Authority
FYLF.....	Foothill Yellow-Legged Frog
g.....	grams
GIS .....	Geographic Information System
GLO .....	General Land Office
GORP .....	Great Outdoor Recreation Pages
GPS .....	Global Positioning System
HCP.....	Habitat Conservation Plan
HSC.....	Habitat Suitability Criteria
HHWP .....	Hetch Hetchy Water and Power
HORB .....	Head of Old River Barrier
hp.....	horsepower
HPMP .....	Historic Properties Management Plan
IFIM .....	Instream Flow Incremental Methodology
ILP.....	Integrated Licensing Process
in .....	inches
ISR .....	Initial Study Report
ITA .....	Indian Trust Assets
IUCN.....	International Union for the Conservation of Nature
KOPs .....	Key Observation Points

kV	.....	kilovolt
kVA	.....	kilovolt-amperes
kW	.....	kilowatt
LWD	.....	large woody debris
m	.....	meters
mm	.....	millimeter
M&I	.....	Municipal and Industrial
MCL	.....	Maximum Contaminant Level
mg/kg	.....	milligrams/kilogram
mg/L	.....	milligrams per liter
mgd	.....	million gallons per day
MGR	.....	Migration of Aquatic Organisms
MHW	.....	Montane Hardwood
mi	.....	miles
mi <sup>2</sup>	.....	square miles
MID	.....	Modesto Irrigation District
MOA	.....	Memorandum of Agreement
MOU	.....	Memorandum of Understanding
MPN	.....	Most Probable Number
MPR	.....	market price referents
MSCS	.....	Multi-Species Conservation Strategy
msl	.....	mean sea level
MUN	.....	municipal and domestic supply
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

NGVD29 .....	National Geodetic Vertical Datum of 1929
NEPA .....	National Environmental Policy Act
NERC .....	North American Electric Reliability Corporation
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
O&M.....	operation and maintenance
OEHHA.....	Office of Environmental Health Hazard Assessment
OID .....	Oakdale Irrigation District
ORV .....	Outstanding Remarkable Value
OSHA.....	Occupational Safety and Health Administration
PA .....	Programmatic Agreement
PAD.....	Pre-Application Document
PDAW.....	Project Demand of Applied Water
PDO.....	Pacific Decadal Oscillation
PEIR.....	Program Environmental Impact Report
PGA.....	Peak Ground Acceleration
PG&E.....	Pacific Gas and Electric
PHABSIM.....	Physical Habitat Simulation System
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
PWA.....	Public Works Administration
QA.....	Quality Assurance
QC.....	Quality Control
RA.....	Recreation Area
RBP .....	Rapid Bioassessment Protocol
REC-1 .....	water contact recreation
REC-2 .....	water non-contact recreation
Reclamation .....	U.S. Department of the Interior, Bureau of Reclamation
RM .....	River Mile
RMP .....	Resource Management Plan
RP.....	Relicensing Participant
rpm .....	Rotations per minute
RPS .....	Renewable Portfolio Standard
RSP .....	Revised Study Plan
RST .....	Rotary Screw Trap
RWG .....	Resource Work Group
RWQCB.....	Regional Water Quality Control Board
SC.....	State candidate for listing under CESA
SCADA.....	Supervisory Control and Data Acquisition
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
SEED.....	U.S. Bureau of Reclamation's Safety Evaluation of Existing Dams
SFP.....	State Fully Protected Species under CESA
SFPUC .....	San Francisco Public Utilities Commission

SHPO .....	State Historic Preservation Officer
SJRA .....	San Joaquin River Agreement
SJRGAA .....	San Joaquin River Group Authority
SJTA .....	San Joaquin River Tributaries Authority
SM.....	Standard Method
SMUD .....	Sacramento Municipal Utility District
SPAWN.....	spawning, reproduction and/or early development
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
SWP .....	State Water Project
SWRCB.....	State Water Resources Control Board
TAC.....	Technical Advisory Committee
TAF.....	thousand acre-feet
TCP .....	Traditional Cultural Properties
TCWC.....	Tuolumne County Water Company
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
USBR .....	U.S. Bureau of Reclamation
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
VES .....	visual encounter surveys
VRM .....	Visual Resource Management
VRO .....	Visual Resource Objective
WBWG .....	Western Bat Working Group
WECC.....	Western Electricity Coordinating Council
WPA.....	Works Progress Administration
WPT .....	Western Pond Turtle
WQCP .....	Water Quality Control Plan
WSA.....	Wilderness Study Area
WSIP .....	Water System Improvement Program
WSNMB .....	Western Sierra Nevada Metamorphic Belt
WUA.....	weighted usable area
WWTP .....	Wastewater Treatment Plant
WY .....	water year
yd <sup>3</sup> .....	cubic yard
yr .....	year
µS/cm .....	microSeimens per centimeter
µg/L.....	micrograms per liter
µmhos.....	micromhos

## PREFACE

---

The Don Pedro Project provides water storage for irrigation and municipal and industrial (M&I) use, flood control, hydroelectric generation, recreation, and natural resource protection (hereinafter, the “Don Pedro Project”). The study area used for the terrestrial resource studies conducted in support of the relicensing considered potential effects of all components, facilities, operations, and maintenance that make up the Don Pedro Project. The Don Pedro Project was originally conceived as a water supply project. The Don Pedro Project was constructed for the following primary purposes: (1) to provide water supply for the co-licensees, Turlock Irrigation District (TID) and Modesto Irrigation District (MID) (collectively, the Districts), for irrigation of over 200,000 acres (ac) of Central Valley farmland and for M&I use, (2) to provide flood control benefits along the Tuolumne and San Joaquin rivers, and (3) to provide a water banking arrangement for the benefit of the City and County of San Francisco (CCSF) and its 2.6 million Bay Area water customers. The original license was issued in 1966. In 1995, the Districts entered into an agreement with a number of parties which resulted in greater flows to the lower Tuolumne River for the protection of aquatic resources.

Hydroelectric generation is a secondary purpose of the Don Pedro Project. Hereinafter, the hydroelectric generation facilities and operations will be referred to as the “Don Pedro Hydroelectric Project”, or the “Project”. With this license application to FERC, the Districts are seeking a new license to continue generating hydroelectric power. Based on the information contained in this application, and other sources of information on the record, FERC will consider whether, and under what conditions, to issue a new license for the continued generation of hydropower at the Districts’ Don Pedro Project. The Districts are providing a complete description of the facilities and operation of the Don Pedro Project so the effects of the operation and maintenance of the Don Pedro hydroelectric facilities can be distinguished from the effects of the operation and maintenance activities of the overall Don Pedro Project’s flood control and water supply/consumptive use purposes.

Being able to differentiate the effects of the hydropower operations from the effects of the flood control and consumptive use purposes and needs of the Don Pedro Project will aid in defining the scope and substance of reasonable protection, mitigation, and enhancement (PM&E) alternatives to be considered in relicensing. As FERC states in Scoping Document 2 in a discussion related to alternative project operation scenarios: “...alternatives that address the consumptive use of water in the Tuolumne River through construction of new structures or methods designed to alter or reduce consumptive use of water are...alternative mitigation strategies that could not replace the Don Pedro *hydroelectric* project [emphasis added]. As such, these recommended alternatives do not satisfy the NEPA purpose and need for the proposed action and are not reasonable alternatives for the NEPA analysis.”

## 1.0 INTRODUCTION

---

Turlock Irrigation District (TID) and Modesto Irrigation District (MID) (collectively, the Districts) are the co-licensees of the 168-megawatt (MW) Don Pedro Hydroelectric Project (the Project) located on the Tuolumne River in western Tuolumne County in the Central Valley region of California. This document presents the Draft Vegetation Management Plan (the Plan)

for the Don Pedro Project, describing the Districts' proposed resource measures addressing noxious weed management, special-status plant management, Valley Elderberry Longhorn Beetle (VELB) host plant management, and revegetation following ground-disturbing activities. The Draft Vegetation Management Plan is organized into five main sections:

**Section 1** - Describes the Don Pedro Project and the Draft Vegetation Management Plan;

**Section 2** - Defines noxious weed species addressed under the Draft Vegetation Management Plan, provides noxious weed prevention guidelines for the Don Pedro Project, and describes noxious weed management efforts to be conducted by the Districts;

**Section 3** - Defines special-status plant species addressed under the Draft Vegetation Management Plan and describes special-status plant protection and monitoring efforts to be conducted by the Districts;

**Section 4** - Describes the Districts' proposals regarding VELB host plants; and

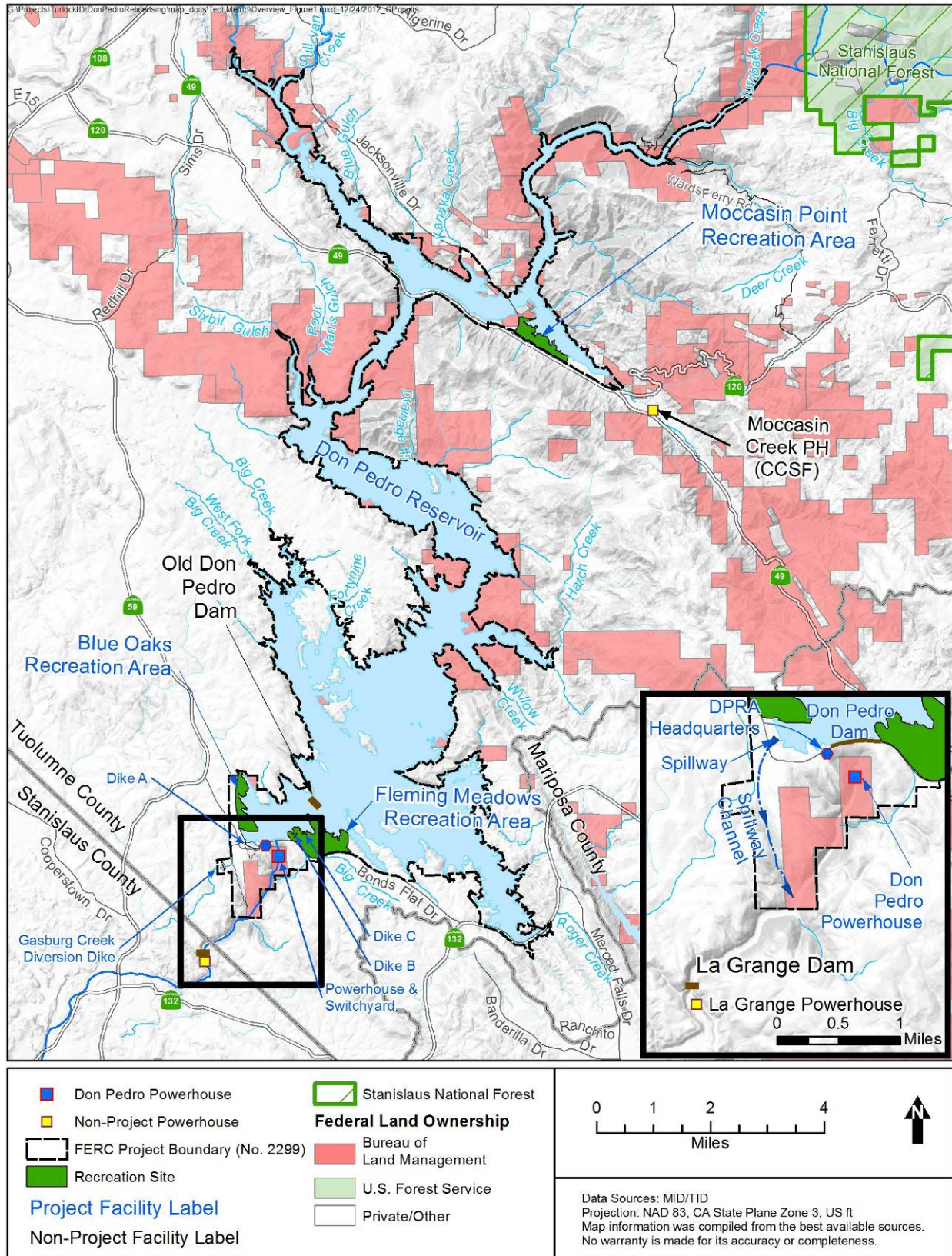
**Section 5** – Describes bi-annual employee trainings, biennial agency consultation, and periodic review of noxious weed and special-status plant lists.

## **1.1 General Description of the Don Pedro Project**

The Districts are the co-licensees of the 168-megawatt (MW) Project located on the Tuolumne River in western Tuolumne County, in the Central Valley region of California. 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 feet (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<sup>2</sup>).

The Project Boundary extends from approximately one mile downstream of the dam to approximately RM 80.8 upstream of the dam. Upstream of the dam, the Project Boundary runs generally along the 845 ft contour interval. The top of the Don Pedro Dam is at elevation 855 ft. The Project Boundary encompasses approximately 18,370 ac with 74 percent of the lands owned jointly by the Districts and the remaining 26 percent (approximately 4,802 ac) owned by the United States and administered as a part of the U.S. Bureau of Land Management (BLM) Sierra Resource Management Area.

The primary Don Pedro 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 Don Pedro Project and its primary facilities is shown in Figure 1.1-1.



**Figure 1.1-1. Don Pedro Project site location map.**



## **1.2 General Description of Current Vegetation Management Activities**

The Districts conduct vegetation management, including noxious weed management, as part of routine activities. These vegetation management activities include:

- mechanical vegetation trimming along roads and recreation trails in the road/trail right-of-way for continued access and line-of-sight safety,
- mechanical vegetation trimming along paths parallel to canals to keep paths clear and for safety,
- mechanical vegetation trimming and herbicide use clearing to maintain bare ground adjacent to Don Pedro Project buildings and structures,
- mechanical vegetation trimming and herbicide use at switchyards and structures for fire safety,
- vegetation removal on dams to keep clear of woody vegetation and grasses for dam safety purposes, and
- mechanical maintenance of bare ground in recreation areas where bare ground currently occurs and is desired.
- prescribed burns within the limitations of timing, weather conditions, and frequency set by the Districts' prescribed burn program.

These routine activities will be conducted in accordance with Best Management Practices (BMPs) listed in Section 2.0, and use restrictions listed in Section 3.0, but are not otherwise considered components of the Draft Vegetation Management Plan.

## **2.0 NOXIOUS WEEDS**

---

The Districts' proposed noxious weed prevention and management measures are provided below for all BLM-administered lands and lands under the Districts' ownership within the Project Boundary. For the purposes of the Draft Vegetation Management Plan, noxious weeds are defined as plant species that are:

- listed as “noxious” under the Federal Plant Protection Act,
- listed as “noxious” and with a pest rating of A, B or C by the California Department of Food and Agriculture (CDFA), or
- identified as noxious during annual consultation with the BLM.

### **2.1 Best Management Practices**

The Districts will conduct their routine recreation, facilities, and lands management activities consistent with the objective of minimizing the potential for the introduction and spread of noxious weeds. Specifically, the following prevention guidelines will be used by the Districts' personnel, Don Pedro Recreation Agency (DPRA) or contractors working within lands addressed by the Draft Vegetation Management Plan; however, exceptions may occur in unusual or time-sensitive circumstances (e.g., emergency maintenance).

- Thoroughly clean all heavy construction equipment and vehicles that have been used off-road before entering the Project Boundary to reasonably ensure that seeds of noxious weeds are not introduced.
- Minimize ground disturbance during routine operations and management activities. When ground disturbance is required, dispose of any resulting spoils on-site if feasible, grading to match local contours and reseeding with a certified weed-free mix of native species. If fill is required, use fill collected on-site whenever possible, and reseed the disturbed area with a certified weed-free mix of native species.
- For ground disturbances larger than 0.25 ac in size, conduct revegetation in accordance with BLM Manual Handbook-1745-1, Use of Native Plant Materials in California, as periodically updated by the BLM (Attachment A).
- Use weed-free straw and native plant species for all construction, erosion control, or restoration needs.
- Restrict travel to established roads when possible, and avoid entering areas with existing noxious weed occurrences. If entering such areas is required, conduct work in uninfested areas first.

### **2.2 Noxious Weed Surveys**

Beginning in the second year following license issuance, and every fifth year thereafter, the Districts will conduct a noxious weed survey of BLM-administered lands within the Red Hills Area of Critical Environmental Concern as well as lands within the Project Boundary that are



subject to operations and maintenance activities, including Don Pedro Project facilities and the Moccasin Point, Blue Oaks, and Fleming Meadows recreation areas. Surveys will be conducted at an appropriate intensity to determine the nature and distribution of noxious weed occurrences in the survey areas, and will focus on developed habitats, along roads, adjacent to facilities, and similar areas most likely to be prone to noxious weed infestations. Surveyors will record noxious weed species composition, location, and relative abundance, and will collect the following Global Positioning System (GPS) data:

- For A- and B-listed noxious weeds, use GPS to delineate a polygon for occurrences >0.1 acre in size, or a linear feature for linear occurrences >100 ft (e.g., along roads); smaller occurrences to be mapped by a single GPS point taken near the center of the occurrence.
- For C-listed or other noxious weeds, distribution of the species to be described generally, but with reference to Don Pedro Project features when feasible. Smaller or discrete occurrences will be mapped by a single GPS point taken near the center of the occurrence.

Data from survey efforts will be provided to the BLM in the biennial report as part of agency consultation (see below).

## 2.3 Noxious Weed Management Guidelines

On BLM-administered lands and lands under the Districts' ownership within the Project Boundary, noxious weeds will be managed according to the degree of threat posed to other resources (e.g., special-status plant occurrences) and the current weed status and feasibility of control as detailed in Table 2.3-1.

**Table 2.3-1. Noxious weed management guidelines for the Don Pedro Project.**

Current Weed Status	Typical CDFA Listing <sup>1</sup>	Plan Priority	Example Management Method
Not currently present, potential to invade	A, B	High	<b>Prevention:</b> implementation of noxious weed prevention guidelines, periodic survey efforts.
Present, localized	A and B and new occurrences of some C-listed weeds	High (A and B) or Moderate (C)	<b>Control:</b> intensive treatment including eradication of List A occurrences, consideration of treatment for new, small occurrences of List C, control and/or eradication of List B occurrences. <b>Containment:</b> education, implementation of weed prevention guidelines.
Present, widespread	C	Moderate or Low	<b>Containment:</b> implementation of noxious weed prevention guidelines; consideration of localized treatment near sensitive resources.

<sup>1</sup> CDFA Listings:

A: An organism of known economic importance subject to state action involving: eradication, quarantine, containment, rejection, or other holding action.

B: An organism of known economic importance subject to: eradication, containment, control or other holding action.

C: An organism subject to no state-enforced action outside of nurseries except to retard spread.

When warranted within these guidelines, the Districts will implement individual noxious weed management activities for certain noxious weed occurrences or species. Prior to implementation,

each noxious weed management activity will be described as part of biennial agency consultation with the BLM, including the following information:

- current distribution and location of target noxious weed occurrence,
- proposed management method, duration, schedule, and specific application plans,
- desired future condition and criteria for success, and
- follow-up monitoring methods and schedule.

On BLM-administered lands, herbicide use will be in compliance with BLM standards. Only those herbicides approved for use will be applied to BLM lands.

## 2.4 Management of Existing Occurrences

Two Class B noxious weeds are currently known to occur within the Project Boundary. In accordance with the noxious weed management guidelines described above, the Districts' proposed management for these occurrences is provided in Table 2.4-1.

Herbicides and adjuvants used during management will be drawn from the BLM's list of approved chemicals, and used in compliance with labeling. Specific application rates and frequency and timing of application will be developed for each occurrence upon implementation of the Plan.

**Table 2.4-1. Class A and B noxious weed occurrences known from lands addressed by the Draft Vegetation Management Plan.**

Occurrence No.	General Location	Property Owner	Percent Cover	Class <sup>1</sup>	Proposed Treatment <sup>2</sup>
<b>Barbed goatgrass (<i>Aegilops triuncialis</i>)</b>					
283	Recreation Bay	TID/MID	Concentrated	I	Herbicide application.
668	Sixbit Gulch	BLM	Diffuse	I	Herbicide application.
669	Sixbit Gulch	BLM and Private	Diffuse	III	Herbicide application, excepting hand/ mechanical treatment only where within 50 feet of ESA/CESA-listed plant occurrence.
961	Poor Man's Gulch	BLM	Concentrated	I	Herbicide application.
963	Poor Man's Gulch	BLM	Diffuse	IV	Hand/ mechanical treatment only where within 50 feet of ESA/CESA-listed plant occurrence.
<b>Smooth distaff thistle (<i>Carthamus creticus</i>)</b>					
109	Kanaka Point	TID/MID	Diffuse	II	Herbicide application, excepting hand/mechanical treatment only where within 50 feet of ESA/CESA-listed plant occurrence.
216	Kanaka Point	BLM	Concentrated	I	
229	Kanaka Point	TID/MID	Concentrated	I	
239	Kanaka Point	TID/MID	Concentrated	I	
248	Jacksonville Rd.	TID/MID	Diffuse	I	
249	Jacksonville Rd.	TID/MID	Concentrated	I	
250	Jacksonville Rd.	BLM, TID/MID	Concentrated	III	

Occurrence No.	General Location	Property Owner	Percent Cover	Class <sup>1</sup>	Proposed Treatment <sup>2</sup>
		and Private			
251	Jacksonville Rd.	BLM	Concentrated	I	
266	Moccasin Point Recreation Area	BLM	Diffuse	I	
268	Moccasin Point Recreation Area	BLM	Diffuse	I	
269	Moccasin Point Recreation Area	BLM	Diffuse	II	
270	Jacksonville Rd.	TID/MID	Diffuse	I	
285	Woods Creek Arm	TID/MID	Diffuse	I	
671	Kanaka Point	TID/MID	Concentrated	I	
672	Kanaka Point	TID/MID	Concentrated	I	
<b>Tamarisk (<i>Tamarix</i> sp.)</b>					
259	Moccasin Point Recreation Area	TID/MID	Concentrated	I	Mechanical removal of single plant.

<sup>1</sup> Class I: 0-0.1 acre, Class II: 0.1-0.25 acre, Class III: 0.25-4.0 acres, Class IV: >4.0 acres

<sup>2</sup> Specific herbicides, application rates, frequency, and timing will be developed upon implementation of the Plan.

## **3.0 SPECIAL-STATUS PLANTS**

---

The Districts' proposed special-status plant monitoring and protection measures are provided below for all BLM-administered lands and lands under the Districts' ownership within the Project Boundary. For the purposes of the Draft Vegetation Management Plan, special-status plants are those species that are any of the following:

- found on BLM-managed lands and listed by the BLM as Sensitive Species (BLM-S),
- listed as threatened or endangered under the Endangered Species Act (ESA), including as Proposed or a Candidate for listing as endangered or threatened species,
- listed as threatened or endangered under the State of California Endangered Species Act (CESA), including those proposed for listing, or
- included on the California Department of Fish and Wildlife's list of California Rare species listed under the Native Species Plant Protection Act of 1977.

### **3.1 Special-status Plant Monitoring**

Beginning in the second year of license issuance and every fifth year thereafter, known occurrences of ESA-listed special-status plant species on BLM-administered lands and lands under the Districts' ownership will be located and observed for monitoring purposes. At each located occurrence, surveyors will record data required for completion of California Natural Diversity Database forms, including sensitive plant species composition, GPS-determined location, relative abundance, phenology, habitat description, habitat condition, observable threats, and noxious weed presence. Data from survey efforts will be provided to the BLM in the biennial report as part of agency consultation (see below).

Additional monitoring or site-specific management efforts may be considered if monitoring or other data indicate substantial species decline, specific potential for Don Pedro Project effects on special-status plants, or a need to evaluate individual activities. Any such efforts will be developed in coordination with the BLM during biennial consultation efforts.

### **3.2 Special-status Plant Protection**

The Districts will consult with the BLM to develop specific usage plans for areas surrounding known occurrences of special-status plants with the potential for being directly affected by activities within the Project Boundary (Table 3.2-1). Until specific usage plans are developed, these occurrences will be excluded from routine Don Pedro Project activities.

In addition to these efforts, site-specific surveys for special-status plants will be conducted prior to new ground-disturbing activities affecting more than 0.5 acre, if such surveys are determined to be warranted during pre-activity review and consultation with the BLM.

**Table 3.2-1. Special-status plant occurrences with the potential to be affected by Don Pedro Project activities.**

Occurrence No.	General Location	Property Owner	Plant Count	Location of Occurrence
<b>Red Hills onion (<i>Allium tuolumnense</i>)</b>				
88	Moccasin Point Recreation Area	BLM	50-75	Proximate to road
<b>Mariposa clarkia (<i>Clarkia biloba</i> ssp. <i>australis</i>)</b>				
83	Moccasin Point Recreation Area	TID/MID	18	Recreation area
84	Moccasin Point Recreation Area	TID/MID	>100	Burn pile and recreation area
92	Moccasin Point Recreation Area	BLM	±200	Proximate to road in recreation area
369	Rogers Creek Arm	TID/MID	500	Proximate to road
373	Rogers Creek Arm	TID/MID	30	Proximate to road
378	Rogers Creek Arm	TID/MID	±1000	Proximate to road
385	Rogers Creek Arm	TID/MID	3000	Proximate to road
386	Rogers Creek Arm	TID/MID	500	Proximate to road
<b>Mariposa cryptantha (<i>Cryptantha mariposae</i>)</b>				
86	Moccasin Point Recreation Area	BLM	1000	Within storage area

## **4.0 VELB HOST PLANT GUIDELINES**

---

The Districts will follow U.S. Department of the Interior, Fish and Wildlife Service (USFWS) Conservation Guidelines for management of VELB and VELB host plants (elderberry [*Sambucus* sp.]) within the Project Boundary (Attachment B). These guidelines direct practitioners to avoid and protect VELB host plants whenever possible. The guidelines further state that “complete avoidance (i.e., no adverse effects) can be assumed when a 100-foot (or wider) buffer is established and maintained around elderberry plants containing stems measuring 1.0 inch or greater in diameter at ground level.” Accordingly, the Districts will not engage in ground disturbing activities within 100 ft of a VELB host plant (as mapped during relicensing studies and updated during periodic consultation) without prior authorization from the USFWS.

## **5.0 BIENNIAL ACTIVITIES AND CONSULTATION**

---

### **5.1 Employee and Contractor Training**

Beginning the second calendar year after license issuance, the Districts will provide for biennial (once every two years) environmental training for staff and contractors working on the Don Pedro Project. The training will be designed to familiarize the Districts' and DPRA staff and contractors with the components and requirements of the Draft Vegetation Management Plan, including identification of special-status plants and noxious weeds, planned management activities, and reporting procedures. At minimum, the training will include information on the following:

- recognition of special-status plants,
- recognition of high-priority noxious weed species (based on guidelines described above),
- noxious weed prevention guidelines,
- planned management activities in the coming two years, and
- reporting procedures for special-status plants and noxious weeds.

### **5.2 Agency Consultation**

Beginning the second calendar year after license issuance, the Districts will provide a written report or otherwise consult biennially with the BLM and other resource agencies regarding the Draft Vegetation Management Plan. During this consultation, the Districts will notify the BLM of all planned Vegetation Management Plan activities to be conducted in the coming two years, and will provide the results of prior activities. Additionally, the Districts will specify whether O&M activities are planned within 100 ft of a known special-status plant or VELB host plant occurrence.

### **5.3 List Review**

Beginning the second calendar year after license issuance, the Districts will biennially review current resource agency lists of special-status plants potentially occurring within the Project Boundary. In the event a species is newly listed, the Districts will confer with the appropriate resource agency to determine if the species or un-surveyed suitable habitat for the species is likely to occur on BLM-administered lands affected by Don Pedro Project-related operations or maintenance activities, or on lands affected by ground-disturbing activities planned in the next two-year period. In that event, the Districts will conduct an assessment of the potential for the species to be affected planned maintenance or other ground-disturbing activities, and to recommend appropriate surveys or resource protection measures. Assessment results and findings will be included in the Districts' biennial agency consultation efforts.

Additionally, beginning the second calendar year after license issuance, the Districts will biennially review BLM and CDFA noxious weed lists. In the event a noxious weed species is newly added to the BLM list and is also a CDFA A- or B-listed noxious weed, the Districts will

conduct an assessment of the potential for the species to occur or invade lands in the Project Boundary, and to recommend appropriate surveys or resource protection measures. Assessment results and findings will be included in the Districts' biennial agency consultation report.



**DRAFT VEGETATION MANAGEMENT PLAN**

**ATTACHMENT A**

**BLM MANUAL HANDBOOK-1745-1,  
USE OF NATIVE PLANT MATERIALS IN CALIFORNIA**



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
CALIFORNIA STATE OFFICE  
MANUAL TRANSMITTAL SHEET

Release: 1-243

Date: 09/13/2001

Subject: H- 1745 -1 - Native Plant Materials Handbook

1. Explanation of Material Transmitted: This release transmits the Bureau of Land Management's (BLM) CA-Handbook-Use of Native Plant Materials in California. It provides policy and guidance specific to the use of native plant and plant seed in restoration and other revegetation projects, to ensure the preservation of healthy and productive ecosystems. It directs the use of local plant materials for vegetation projects whenever feasible and appropriate, and gives guidance on improved techniques for native plant restoration. It also provides guidance to prevent the introduction of undesirable vegetation, while emphasizing the use of local genetic composition when restoring native plant communities
2. Reports Required: None
3. Materials Superseded: None
4. Filing Instructions: File as directed below.

REMOVE:

None

INSERT: Release 1-243

H-1745

(Total: 8 sheets, double-sided)

*James Neely*  
State Director  
*JNK*

# USE OF NATIVE PLANT MATERIALS IN CALIFORNIA



*Festuca californica*

Photo By: G.F. Hrusa, Ca. Dept. of Food and Ag

**H-1745-1-NATIVE PLANT MATERIALS HANDBOOK****Table of Contents**

Chapter	Page
I. INTRODUCTION .....	I-1
II GENERAL GUIDELINES .....	II-1
A. Planning Stage .....	II-1
B. Project Review .....	II-2
C. Natural Regeneration .....	II-2
D. Plant Material Collection .....	II-2
E. Commercial Sources .....	II-3
F. Non-Natives .....	II-4
G. Seed Quality .....	II-4
H. Seed Storage .....	II-4
I. Planting and Maintenance .....	II-5
III. ANNUAL REVIEW .....	III-1
IV. DEFINITIONS .....	IV-1

**H-1745-1-NATIVE PLANT MATERIALS HANDBOOK****CHAPTER I****I. INTRODUCTION**

This handbook provides direction on the use of native plants and plant seed in restoration and other revegetation projects. The maintenance of diverse native plant communities on a long-term basis is an essential part of preserving ecosystem health and productivity, and the introduction of persistent non-native plants is clearly contrary to this goal. The handbook expands on the policy elaborated in California BLM Manual Supplement 1745 and establishes the procedures to be used in complying with that policy.

Whenever plant materials are used in management activities such as erosion control, water quality, or restoration projects (including reclamation and rehabilitation), consideration needs to be given to long-term plant community stability and integrity. The selection of genetically appropriate native seeds and plants which achieve the purpose of the planting is therefore a concern. These guidelines establish policy on the use of native plant materials on BLM lands under the jurisdiction of the California State Office.

**H-1745-1-NATIVE PLANT MATERIALS HANDBOOK****CHAPTER II****II. GENERAL GUIDELINES****A. Planning Stage:**

1. Vegetation projects must be planned and evaluated early - preferably several years before the project start date. Seed set may not occur every year, or it may be sparse, so seed collection and stockpiling should begin as early as possible. If nursery grown seedlings are required, allow plenty of time for seed stratification and growing out. Early consideration should also be given to soil stockpiling, erosion control methods, and on-site planting and maintenance activities.

2. Determine the purpose of the planting and set your revegetation goals. If the disturbance has not yet occurred, take measurements of plant composition, density, and cover. Use soil surveys, if available, and look at soil series and ecological sites within the project area as well as the potential natural communities of the site. If this baseline information is not available for the project area, try to find a reference area that is undisturbed and ecologically similar to the project area. Decide what sort of progress can realistically be made toward the desired plant community, and what time-scale you will use to measure progress reports being used to record methodology and results.

3. Determine the desired plant species, the collection method (seeds or cuttings), the amount needed, and the planting method (seeding or transplanting). If nursery services are required, keep in mind that some nurseries require a year or more advance notification.

4. Determine through literature review and personal contacts techniques applicable to the life form you are collecting material from, transplanting, and/or seeding.

5. Develop quality standards for collecting, storing, growing, and outplanting.

6. Develop plans for long-term maintenance and yearly monitoring of the restored area.

7. Develop a contingency plan in case the plant materials become unavailable or fail to survive in the field. Seed availability may be a limiting factor for some species, so several different species should be considered. It is wise to try a variety of restoration methods to increase the odds of success and to determine the best overall method.

8. Maintain an ongoing stock of seed or vegetative materials from frequently used local species in each elevation band within a subsection (see II.D.1, below) if possible, in order to aid in the success of unexpected restoration projects. Meticulous records must be kept on the source

**H-1745-1-NATIVE PLANT MATERIALS HANDBOOK**

of all materials. A central collection facility may be more advantageous if the source areas are carefully controlled and monitored.

**B. Project Review:**

All restoration planning efforts must include coordination with Field Office Restoration Coordinators to ensure that the project is feasible and the appropriate plants and methods are used. Coordination with State Office Restoration Coordinators and knowledgeable individuals in other Federal and State agencies and the academic community is also highly desirable.

**C. Natural Regeneration:**

If there is an ample seed source and suitable conditions, natural regeneration should be encouraged. Topsoil should be salvaged and re-spread if possible, as native seeds and microbiota can often be preserved (if storage length is limited). Erosion control can often be achieved in the interim stage through the use of weed-free mulches such as native grass straw, barley straw, rice hulls, bark, and almond shells.

**D. Plant Material Collection:**

1. Local Plant Source: To the maximum extent possible, seeds and plants used in restoration, erosion control, fire rehabilitation, forage enhancement, and other projects shall originate from local sources. Local sources often possess genotypes that are adapted to the local environment, leading to higher short-term and long-term success rates. "Local" refers to sources within or as close as possible to the project area and within the same subsection (as shown on the Ecological Units of California map; see definitions), and elevation band (within 500') as the project area. Collections should also be made within the same vegetation series and general soil type.

If the plant population is known to be genetically rare, occurs on an unusual soil (e.g., serpentine), is found in an extreme environment (high temperature, low precipitation, etc.), or has distinct morphological characteristics that may be genetically based, then seeds/cuttings shall only be taken from these local variants. For example, a restoration effort on serpentine soil would use only seeds/cuttings collected on serpentine soil from within the same subsection and elevation band. In addition, disjunct plant populations may be genetically distinct and seeds/cuttings should be taken from within the disjunct population. Riparian species should be collected from riparian areas immediately upstream or downstream, or within sub-watersheds within the same subsection and at similar elevations. If a locally rare species is desired for use in revegetation and can only be collected from the wild, consider whether the local populations can support the impacts of collecting seed or propagules.

These guidelines can and should be tailored to individual species. Variation observed within a species is not always due to population differences; it could be a result of individual

**H-1745-1-NATIVE PLANT MATERIALS HANDBOOK**

plant differences, individual seed differences (from the same plant), and collection date differences. The use of common gardens, outplantings, and genetic analysis can be helpful in determining the presence and distribution of ecotypes, and should be done by experienced personnel. Large phenotypic plasticity would indicate that wide seed collection zones would be allowable, while large genetic variability would indicate the use of local ecotypes. Research on the genetic variability of commonly used revegetation species is therefore recommended and encouraged. (Extreme caution should be used in interpreting the results of 1) an isozyme study alone or 2) poorly researched taxa.) As ecotype information becomes available, restoration coordinators should develop seed collection "eco-zones" that will be incorporated into future versions of this policy.

2. Semi-local Plant Source: If sufficient numbers of widely-spaced source plants are unavailable within the same subsection, additional collection should occur in several well distributed sub-populations that have similar environments and are within adjacent subsections within the same section as the project area. Semi-local collection sites should be matched carefully to the project area in terms of elevation, vegetation series, aspect, slope, rainfall, annual temperature patterns, frost dates, and soil type. If plant materials are not available within the same section, consider postponing the project until native sources become available.

3. General: Try to use several (~ 50 or more) unrelated (spaced at least 1/4 mile apart) source plants within the collection area in order to maximize genetic diversity. Collect in areas that match the ecological characteristics of the project area. Only use healthy source plants. Collect seed when it is mature and still on the plant (if possible). For those plants that disperse their seed quickly at maturity, spreading sheets beneath the parent plant is advised. Obtain cuttings at the appropriate time of year and from material that is not too soft. Rapidly growing soft tissue is high in nitrogen and will not produce the auxins needed to root as opposed to more mature, woodier tissue that contains higher ratios of stored carbohydrates. Try to collect an equal number of seeds/cuttings from each source plant. Document the location of all source populations, track the plant materials taken from each population until they reach the field, and monitor the performance of each collection over time. This applies to commercial sources as well. When contracting out for seed collection, make sure the collector is well known, knowledgeable, and respected, and only pay for pounds of PURE LIVE SEED. If collected seeds are grown out in a nursery, make sure that the contract states that the seeds are government property, and cannot be used for commercial purposes. No federally-listed or proposed species shall be used for revegetation without proper coordination with the Fish and Wildlife Service. Consult with the California Department of Fish and Game if state-listed species are being considered for use.

E. Commercial Sources:

If local or semi-local plant sources are unavailable, commercial sources of native plants may be used. Plant materials should be bred and/or grown under environmental conditions that



**H-1745-1-NATIVE PLANT MATERIALS HANDBOOK**

are similar to the project area. Ideally, plant sources should be within the same section as the project area. Plant materials should only be moved from one section to another after careful evaluation. Only use commercial sources if the genetic origin is known. Above all, make sure to ask seed companies where the seed was collected, instead of telling them where you need it from! Be sure that nursery produced native seed was not grown under conditions that could have allowed hybridization with other species or other collections of the same species. Commercial sources should be used as an interim measure, using short-lived species, while adequate supplies of local or semi-local plant materials are being collected or grown.

**F. Non-Natives:**

Although native plants should always be given first consideration, there are certain situations where non-natives may be desired. For example, on highly disturbed sites that have had their physical characteristics altered so that native vegetation can no longer survive, it may be necessary to use non-natives to help restore site stability. Other examples that have been cited include noxious weed control and emergency situations. In cases where the use of non-native vegetation is desired, a justification shall be submitted for approval by the State Director (as outlined in BLM Manual 1745 - Introduction, Transplant, Augmentation, and Reestablishment of Fish, Wildlife, and Plants). All non-native vegetation used should be non-invasive and ideally be short-lived, have low reproductive capabilities, or be self-pollinating in order to prevent gene flow into the native community. One good example is sterile oats, which provide erosion control and will fade out in one year without cultivation (although they do release seed if disturbed). Non-native vegetation should not compete with the naturally occurring native plant community, invade plant communities outside the target area, persist in the target ecosystem over the long term, or exchange genetic material with local native plant species. One approach to selecting such species may be to use genera that do not occur in the target area as there is less likelihood of genetic exchange between genera than between species within a genus. The use of non-natives should be considered as an interim measure only, while local or semi-local sources are developed. Cultivars of native plants produced outside of California require the same justification as non-natives. Non-natives listed in the Department of Food and Agriculture's Noxious Weed Species list or the California Exotic Pest Plant Council's list of wildland weeds shall not be considered for use under any circumstances.

**G. Seed Quality:**

All seeds/plants used for BLM projects shall be tested for weeds, pests and diseases, and shall be processed, stored, and conditioned properly. Due to the threat of complete project failure, 0% weed species and other crop species is required in seed mixtures (see BLM Manual 9015 - Integrated Weed Management). However, if it can be shown that a certain percent of contamination of a weed species or other crop species does not interfere with native plant establishment and is not persistent in the environment, then this level will be raised on a species basis.

**H-1745-1-NATIVE PLANT MATERIALS HANDBOOK****H. Seed Storage:**

Seed storage requirements are highly variable for each species. Generally, each 1% reduction in seed moisture and each 10 ° F reduction in seed temperature doubles the life of the seed. If you wish to store the seeds for 3-5 years at ambient temperatures, dry the seeds to between 5-8% moisture content before tightly sealing in durable containers. For longer storage, dry to 2.5-5% moisture. Make sure you properly label each container with information on species, location of source plant, environmental information, date of collection, and the collector, as a minimum.

**I. Planting and Maintenance:**

1. If direct seeding, consider using pits or imprinted areas to improve germination, mulches to improve survival, and cracked wheat to reduce granivory. High seeding rates are usually recommended, since direct seeding success rates are lower than transplanting.

2. If transplanting, consider using a variety of container sizes, and try to transplant quickly (preferably in one day). If containers are limited, place more near the windward side of the project area to maximize effectiveness.

3. Plant at an optimal time - usually at the start of the rainy season. A knowledgeable restoration specialist should be consulted if irrigation will be necessary.

4. Permits for projects involving restoration must contain a requirement for maintenance and monitoring of the restored area.

5. Track the success or failure of all restoration projects. An annual report on the status of all restoration projects is required. Even failed efforts yield useful information.

**H-1745-1-NATIVE PLANT MATERIALS HANDBOOK****CHAPTER III****III. ANNUAL REVIEW**

This policy will be reviewed by Field Office and State Restoration coordinators on at least an annual basis, at which time the annual reports will be reviewed as well. The current guidelines for seed collection zones and seed purity are general, and future revisions will be needed to outline regional or species-specific standards.

## H-1745-1-NATIVE PLANT MATERIALS HANDBOOK

## CHAPTER IV

## IV. DEFINITIONS

**Ecological Units of California:** Map developed by the Forest Service and Natural Resource Conservation Service in 1994. Subsection units have similar surficial geology, lithology, geomorphic process, soil groups, Subregional climate, and potential natural communities.

**Exotic or Non-native Species:** One that was introduced through human activity.

**Genetically Local Source:** Plant material that originated at or within the same subsection and elevation band as the project site.

**Native Plant:** One that occurs and has evolved naturally in California, and in the project area, as determined by climate, soil, and biotic factors, and that was not introduced by human activity.

**Revegetation:** A general term for renewing the vegetation on a project site, which may include restoration and rehabilitation.

**Stand:** Aggregation of individual plants separated from other such aggregations so that cross fertilization rarely occurs (if at all).

**Undesirable Plant:** May be a non-native species, non-adapted source, genetically changed through selection in a foreign dissimilar environment, or possesses trait(s) that conflict with accomplishment of objectives.

**DRAFT VEGETATION MANAGEMENT PLAN**

**ATTACHMENT B**

**CONSERVATION GUIDELINES FOR THE  
VALLEY ELDERBERRY LONGHORN BEETLE**

# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Sacramento Fish and Wildlife Office  
2800 Cottage Way, Room W-2605  
Sacramento, California 95825

Conservation Guidelines for the  
Valley Elderberry Longhorn Beetle  
9 July 1999

The following guidelines have been issued by the U.S. Fish and Wildlife Service (Service) to assist Federal agencies and non-federal project applicants needing incidental take authorization through a section 7 consultation or a section 10(a)(1)(B) permit in developing measures to avoid and minimize adverse effects on the valley elderberry longhorn beetle. The Service will revise these guidelines as needed in the future. The most recently issued version of these guidelines should be used in developing all projects and habitat restoration plans. The survey and monitoring procedures described below are designed to avoid any adverse effects to the valley elderberry longhorn beetle. Thus a recovery permit is not needed to survey for the beetle or its habitat or to monitor conservation areas. If you are interested in a recovery permit for research purposes please call the Service's Regional Office at (503) 231-2063.

## Background Information

The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), was listed as a threatened species on August 8, 1980 (Federal Register 45: 52803-52807). This animal is fully protected under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). The valley elderberry longhorn beetle (beetle) is completely dependent on its host plant, elderberry (*Sambucus* species), which is a common component of the remaining riparian forests and adjacent upland habitats of California's Central Valley. Use of the elderberry by the beetle, a wood borer, is rarely apparent. Frequently, the only exterior evidence of the elderberry's use by the beetle is an exit hole created by the larva just prior to the pupal stage. The life cycle takes one or two years to complete. The animal spends most of its life in the larval stage, living within the stems of an elderberry plant. Adult emergence is from late March through June, about the same time the elderberry produces flowers. The adult stage is short-lived. Further information on the life history, ecology, behavior, and distribution of the beetle can be found in a report by Barr (1991) and the recovery plan for the beetle (USFWS 1984).

## Surveys

Proposed project sites within the range of the valley elderberry longhorn beetle should be surveyed for the presence of the beetle and its elderberry host plant by a qualified biologist. The beetle's range extends throughout California's Central Valley and associated foothills from about the 3,000-foot elevation contour on the east and the watershed of the Central Valley on the west (Figure 1). All or portions of 31 counties are included: Alameda, Amador, Butte, Calaveras, Colusa, Contra Costa, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Madera, Mariposa, Merced, Napa, Nevada, Placer, Sacramento, San Benito, San Joaquin, San Luis Obispo, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba.

If elderberry plants with one or more stems measuring 1.0 inch or greater in diameter at ground level occur on or adjacent to the proposed project site, or are otherwise located where they may be directly or indirectly affected by the proposed action, minimization measures which include planting replacement habitat (conservation planting) are required (Table 1).

All elderberry shrubs with one or more stems measuring 1.0 inch or greater in diameter at ground level that occur on or adjacent to a proposed project site must be thoroughly searched for beetle exit holes (external evidence of beetle presence). In addition, all elderberry stems one inch or greater in diameter at ground level must be tallied by diameter size class (Table 1). As outlined in Table 1, the numbers of elderberry seedlings/cuttings and associated riparian native trees/shrubs to be planted as replacement habitat are determined by stem size class of affected elderberry shrubs, presence or absence of exit holes, and whether a proposed project lies in a riparian or non-riparian area.

Elderberry plants with no stems measuring 1.0 inch or greater in diameter at ground level are unlikely to be habitat for the beetle because of their small size and/or immaturity. Therefore, no minimization measures are required for removal of elderberry plants with no stems measuring 1.0 inch or greater in diameter at ground level with no exit holes. Surveys are valid for a period of two years.

## Avoid and Protect Habitat Whenever Possible

Project sites that do not contain beetle habitat are preferred. If suitable habitat for the beetle occurs on the project site, or within close proximity where beetles will be affected by the project, these areas must be designated as avoidance areas and must be protected from disturbance during the construction and operation of the project. When possible, projects should be designed such that avoidance areas are connected with adjacent habitat to prevent fragmentation and isolation of beetle populations. Any beetle habitat that cannot be avoided as described below should be considered impacted and appropriate minimization measures should be proposed as described below.

### Avoidance: Establishment and Maintenance of a Buffer Zone

Complete avoidance (i.e., no adverse effects) may be assumed when a 100-foot (or wider) buffer is established and maintained around elderberry plants containing stems measuring 1.0 inch or greater in diameter at ground level. Firebreaks may not be included in the buffer zone. In buffer areas construction-related disturbance should be minimized, and any damaged area should be promptly restored following construction. The Service must be consulted before any disturbances within the buffer area are considered. In addition, the Service must be provided with a map identifying the avoidance area and written details describing avoidance measures.

### Protective Measures

1. Fence and flag all areas to be avoided during construction activities. In areas where encroachment on the 100-foot buffer has been approved by the Service, provide a minimum setback of at least 20 feet from the dripline of each elderberry plant.
2. Brief contractors on the need to avoid damaging the elderberry plants and the possible penalties for not complying with these requirements.
3. Erect signs every 50 feet along the edge of the avoidance area with the following information: "This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." The signs should be clearly readable from a distance of 20 feet, and must be maintained for the duration of construction.
4. Instruct work crews about the status of the beetle and the need to protect its elderberry host plant.

### Restoration and Maintenance

1. Restore any damage done to the buffer area (area within 100 feet of elderberry plants) during construction. Provide erosion control and re-vegetate with appropriate native plants.
2. Buffer areas must continue to be protected after construction from adverse effects of the project. Measures such as fencing, signs, weeding, and trash removal are usually appropriate.
3. No insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant should be used in the buffer areas, or within 100 feet of any elderberry plant with one or more stems measuring 1.0 inch or greater in diameter at ground level.



4. The applicant must provide a written description of how the buffer areas are to be restored, protected, and maintained after construction is completed.
5. Mowing of grasses/ground cover may occur from July through April to reduce fire hazard. No mowing should occur within five (5) feet of elderberry plant stems. Mowing must be done in a manner that avoids damaging plants (e.g., stripping away bark through careless use of mowing/trimming equipment).

#### Transplant Elderberry Plants That Cannot Be Avoided

Elderberry plants must be transplanted if they can not be avoided by the proposed project. All elderberry plants with one or more stems measuring 1.0 inch or greater in diameter at ground level must be transplanted to a conservation area (see below). At the Service's discretion, a plant that is unlikely to survive transplantation because of poor condition or location, or a plant that would be extremely difficult to move because of access problems, may be exempted from transplantation. In cases where transplantation is not possible the minimization ratios in Table 1 may be increased to offset the additional habitat loss.

Trimming of elderberry plants (e.g., pruning along roadways, bike paths, or trails) with one or more stems 1.0 inch or greater in diameter at ground level, may result in take of beetles. Therefore, trimming is subject to appropriate minimization measures as outlined in Table 1.

1. Monitor. A qualified biologist (monitor) must be on-site for the duration of the transplanting of the elderberry plants to insure that no unauthorized take of the valley elderberry longhorn beetle occurs. If unauthorized take occurs, the monitor must have the authority to stop work until corrective measures have been completed. The monitor must immediately report any unauthorized take of the beetle or its habitat to the Service and to the California Department of Fish and Game.
2. Timing. Transplant elderberry plants when the plants are dormant, approximately November through the first two weeks in February, after they have lost their leaves. Transplanting during the non-growing season will reduce shock to the plant and increase transplantation success.
3. Transplanting Procedure.
  - a. Cut the plant back 3 to 6 feet from the ground or to 50 percent of its height (whichever is taller) by removing branches and stems above this height. The trunk and all stems measuring 1.0 inch or greater in diameter at ground level should be replanted. Any leaves remaining on the plant should be removed.

- b. Excavate a hole of adequate size to receive the transplant.
- c. Excavate the plant using a Vemeer spade, backhoe, front end loader, or other suitable equipment, taking as much of the root ball as possible, and replant immediately at the conservation area. Move the plant only by the root ball. If the plant is to be moved and transplanted off site, secure the root ball with wire and wrap it with burlap. Dampen the burlap with water, as necessary, to keep the root ball wet. Do not let the roots dry out. Care should be taken to ensure that the soil is not dislodged from around the roots of the transplant. If the site receiving the transplant does not have adequate soil moisture, pre-wet the soil a day or two before transplantation.
- d. The planting area must be at least 1,800 square feet for each elderberry transplant. The root ball should be planted so that its top is level with the existing ground. Compact the soil sufficiently so that settlement does not occur. As many as five (5) additional elderberry plantings (cuttings or seedlings) and up to five (5) associated native species plantings (see below) may also be planted within the 1,800 square foot area with the transplant. The transplant and each new planting should have its own watering basin measuring at least three (3) feet in diameter. Watering basins should have a continuous berm measuring approximately eight (8) inches wide at the base and six (6) inches high.
- e. Saturate the soil with water. Do not use fertilizers or other supplements or paint the tips of stems with pruning substances, as the effects of these compounds on the beetle are unknown.
- f. Monitor to ascertain if additional watering is necessary. If the soil is sandy and well-drained, plants may need to be watered weekly or twice monthly. If the soil is clayey and poorly-drained, it may not be necessary to water after the initial saturation. However, most transplants require watering through the first summer. A drip watering system and timer is ideal. However, in situations where this is not possible, a water truck or other apparatus may be used.

#### Plant Additional Seedlings or Cuttings

Each elderberry stem measuring 1.0 inch or greater in diameter at ground level that is adversely affected (i.e., transplanted or destroyed) must be replaced, in the conservation area, with elderberry seedlings or cuttings at a ratio ranging from 1:1 to 8:1 (new plantings to affected stems). Minimization ratios are listed and explained in Table 1. Stock of either seedlings or cuttings should be obtained from local sources. Cuttings may be obtained from the plants to be transplanted if the project site is in the vicinity of the conservation area. If the Service determines that the elderberry plants on the proposed project site are unsuitable candidates for

transplanting, the Service may allow the applicant to plant seedlings or cuttings at higher than the stated ratios in Table 1 for each elderberry plant that cannot be transplanted.

### Plant Associated Native Species

Studies have found that the beetle is more abundant in dense native plant communities with a mature overstory and a mixed understory. Therefore, a mix of native plants associated with the elderberry plants at the project site or similar sites will be planted at ratios ranging from 1:1 to 2:1 [native tree/plant species to each elderberry seedling or cutting (see Table 1)]. These native plantings must be monitored with the same survival criteria used for the elderberry seedlings (see below). Stock of saplings, cuttings, and seedlings should be obtained from local sources. If the parent stock is obtained from a distance greater than one mile from the conservation area, approval by the Service of the native plant donor sites must be obtained prior to initiation of the revegetation work. Planting or seeding the conservation area with native herbaceous species is encouraged. Establishing native grasses and forbs may discourage unwanted non-native species from becoming established or persisting at the conservation area. Only stock from local sources should be used.

### Examples

#### Example 1

The project will adversely affect beetle habitat on a vacant lot on the land side of a river levee. This levee now separates beetle habitat on the vacant lot from extant Great Valley Mixed Riparian Forest (Holland 1986) adjacent to the river. However, it is clear that the beetle habitat located on the vacant lot was part of a more extensive mixed riparian forest ecosystem extending farther from the river's edge prior to agricultural development and levee construction. Therefore, the beetle habitat on site is considered riparian. A total of two elderberry plants with at least one stem measuring 1.0 inch or greater in diameter at ground level will be affected by the proposed action. The two plants have a total of 15 stems measuring over 1.0 inch. No exit holes were found on either plant. Ten of the stems are between 1.0 and 3.0 inches in diameter and five of the stems are greater than 5.0 inches in diameter. The conservation area is suited for riparian forest habitat. Associated natives adjacent to the conservation area are box elder (*Acer negundo californica*), walnut (*Juglans californica* var. *hindsii*), sycamore (*Platanus racemosa*), cottonwood (*Populus fremontii*), willow (*Salix gooddingii* and *S. laevigata*), white alder (*Alnus rhombifolia*), ash (*Fraxinus latifolia*), button willow (*Cephalanthus occidentalis*), and wild grape (*Vitis californica*).

Minimization (based on ratios in Table 1):

- Transplant the two elderberry plants that will be affected to the conservation area.
- Plant 40 elderberry rooted cuttings (10 affected stems compensated at 2:1 ratio and 5 affected stems compensated at 4:1 ratio, cuttings planted:stems affected)
- Plant 40 associated native species (ratio of associated natives to elderberry plantings is 1:1 in areas with no exit holes):
  - 5 saplings each of box elder, sycamore, and cottonwood
  - 5 willow seedlings
  - 5 white alder seedlings
  - 5 saplings each of walnut and ash
  - 3 California button willow
  - 2 wild grape vines
  - Total: 40 associated native species
- Total area required is a minimum of 1,800 sq. ft. for one to five elderberry seedlings and up to 5 associated natives. Since, a total of 80 plants must be planted (40 elderberries and 40 associated natives), a total of 0.33 acre (14,400 square feet) will be required for conservation plantings. The conservation area will be seeded and planted with native grasses and forbs, and closely monitored and maintained throughout the monitoring period.

Example 2

The project will adversely affect beetle habitat in Blue Oak Woodland (Holland 1986). One elderberry plant with at least one stem measuring 1.0 inch or greater in diameter at ground level will be affected by the proposed action. The plant has a total of 10 stems measuring over 1.0 inch. Exit holes were found on the plant. Five of the stems are between 1.0 and 3.0 inches in diameter and five of the stems are between 3.0 and 5.0 inches in diameter. The conservation area is suited for elderberry savanna (non-riparian habitat). Associated natives adjacent to the conservation area are willow (*Salix* species), blue oak (*Quercus douglasii*), interior live oak (*Q. wislizenii*), sycamore, poison oak (*Toxicodendron diversilobum*), and wild grape.

Minimization (based on ratios in Table 1):

- Transplant the one elderberry plant that will be affected to the conservation area.
- Plant 30 elderberry seedlings (5 affected stems compensated at 2:1 ratio and 5 affected stems compensated at 4:1 ratio, cuttings planted:stems affected)

- Plant 60 associated native species (ratio of associated natives to elderberry plantings is 2:1 in areas with exit holes):

20 saplings of blue oak, 20 saplings of sycamore, and 20 saplings of willow, and seed and plant with a mixture of native grasses and forbs

- Total area required is a minimum of 1,800 sq. ft. for one to five elderberry seedlings and up to 5 associated natives. Since, a total of 90 plants must be planted (30 elderberries and 60 associated natives), a total of 0.37 acre (16,200 square feet) will be required for conservation plantings. The conservation area will be seeded and planted with native grasses and forbs, and closely monitored and maintained throughout the monitoring period.

#### Conservation Area—Provide Habitat for the Beetle in Perpetuity

The conservation area is distinct from the avoidance area (though the two may adjoin), and serves to receive and protect the transplanted elderberry plants and the elderberry and other native plantings. The Service may accept proposals for off-site conservation areas where appropriate.

1. **Size.** The conservation area must provide at least 1,800 square feet for each transplanted elderberry plant. As many as 10 conservation plantings (i.e., elderberry cuttings or seedlings and/or associated native plants) may be planted within the 1800 square foot area with each transplanted elderberry. An additional 1,800 square feet shall be provided for every additional 10 conservation plants. Each planting should have its own watering basin measuring approximately three feet in diameter. Watering basins should be constructed with a continuous berm measuring approximately eight inches wide at the base and six inches high.

The planting density specified above is primarily for riparian forest habitats or other habitats with naturally dense cover. If the conservation area is an open habitat (i.e., elderberry savanna, oak woodland) more area may be needed for the required plantings. Contact the Service for assistance if the above planting recommendations are not appropriate for the proposed conservation area.

No area to be maintained as a firebreak may be counted as conservation area. Like the avoidance area, the conservation area should connect with adjacent habitat wherever possible, to prevent isolation of beetle populations.

Depending on adjacent land use, a buffer area may also be needed between the conservation area and the adjacent lands. For example, herbicides and pesticides are

often used on orchards or vineyards. These chemicals may drift or runoff onto the conservation area if an adequate buffer area is not provided.

2. Long-Term Protection. The conservation area must be protected in perpetuity as habitat for the valley elderberry longhorn beetle. A conservation easement or deed restrictions to protect the conservation area must be arranged. Conservation areas may be transferred to a resource agency or appropriate private organization for long-term management. The Service must be provided with a map and written details identifying the conservation area; and the applicant must receive approval from the Service that the conservation area is acceptable prior to initiating the conservation program. A true, recorded copy of the deed transfer, conservation easement, or deed restrictions protecting the conservation area in perpetuity must be provided to the Service before project implementation.

Adequate funds must be provided to ensure that the conservation area is managed in perpetuity. The applicant must dedicate an endowment fund for this purpose, and designate the party or entity that will be responsible for long-term management of the conservation area. The Service must be provided with written documentation that funding and management of the conservation area (items 3-8 above) will be provided in perpetuity.

3. Weed Control. Weeds and other plants that are not native to the conservation area must be removed at least once a year, or at the discretion of the Service and the California Department of Fish and Game. Mechanical means should be used; herbicides are prohibited unless approved by the Service.
4. Pesticide and Toxicant Control. Measures must be taken to insure that no pesticides, herbicides, fertilizers, or other chemical agents enter the conservation area. No spraying of these agents must be done within one 100 feet of the area, or if they have the potential to drift, flow, or be washed into the area in the opinion of biologists or law enforcement personnel from the Service or the California Department of Fish and Game.
5. Litter Control. No dumping of trash or other material may occur within the conservation area. Any trash or other foreign material found deposited within the conservation area must be removed within 10 working days of discovery.
6. Fencing. Permanent fencing must be placed completely around the conservation area to prevent unauthorized entry by off-road vehicles, equestrians, and other parties that might damage or destroy the habitat of the beetle, unless approved by the Service. The applicant must receive written approval from the Service that the fencing is acceptable prior to initiation of the conservation program. The fence must be maintained in perpetuity, and must be repaired/replaced within 10 working days if it is found to be damaged. Some conservation areas may be made available to the public for appropriate recreational and educational opportunities with written approval from the Service. In

these cases appropriate fencing and signs informing the public of the beetle's threatened status and its natural history and ecology should be used and maintained in perpetuity.

7. Signs. A minimum of two prominent signs must be placed and maintained in perpetuity at the conservation area, unless otherwise approved by the Service. The signs should note that the site is habitat of the federally threatened valley elderberry longhorn beetle and, if appropriate, include information on the beetle's natural history and ecology. The signs must be approved by the Service. The signs must be repaired or replaced within 10 working days if they are found to be damaged or destroyed.

### Monitoring

The population of valley elderberry longhorn beetles, the general condition of the conservation area, and the condition of the elderberry and associated native plantings in the conservation area must be monitored over a period of either ten (10) consecutive years or for seven (7) years over a 15-year period. The applicant may elect either 10 years of monitoring, with surveys and reports every year; or 15 years of monitoring, with surveys and reports on years 1, 2, 3, 5, 7, 10, and 15. The conservation plan provided by the applicant must state which monitoring schedule will be followed. No change in monitoring schedule will be accepted after the project is initiated. If conservation planting is done in stages (i.e., not all planting is implemented in the same time period), each stage of conservation planting will have a different start date for the required monitoring time.

Surveys. In any survey year, a minimum of two site visits between February 14 and June 30 of each year must be made by a qualified biologist. Surveys must include:

1. A population census of the adult beetles, including the number of beetles observed, their condition, behavior, and their precise locations. Visual counts must be used; mark-recapture or other methods involving handling or harassment must not be used.
2. A census of beetle exit holes in elderberry stems, noting their precise locations and estimated ages.
3. An evaluation of the elderberry plants and associated native plants on the site, and on the conservation area, if disjunct, including the number of plants, their size and condition.
4. An evaluation of the adequacy of the fencing, signs, and weed control efforts in the avoidance and conservation areas.

5. A general assessment of the habitat, including any real or potential threats to the beetle and its host plants, such as erosion, fire, excessive grazing, off-road vehicle use, vandalism, excessive weed growth, etc.

The materials and methods to be used in the monitoring studies must be reviewed and approved by the Service. All appropriate Federal permits must be obtained prior to initiating the field studies.

**Reports.** A written report, presenting and analyzing the data from the project monitoring, must be prepared by a qualified biologist in each of the years in which a monitoring survey is required. Copies of the report must be submitted by December 31 of the same year to the Service (Chief of Endangered Species, Sacramento Fish and Wildlife Office), and the Department of Fish and Game (Supervisor, Environmental Services, Department of Fish and Game, 1416 Ninth Street, Sacramento, California 95814; and Staff Zoologist, California Natural Diversity Data Base, Department of Fish and Game, 1220 S Street, Sacramento, California 95814). The report must explicitly address the status and progress of the transplanted and planted elderberry and associated native plants and trees, as well as any failings of the conservation plan and the steps taken to correct them. Any observations of beetles or fresh exit holes must be noted. Copies of original field notes, raw data, and photographs of the conservation area must be included with the report. A vicinity map of the site and maps showing where the individual adult beetles and exit holes were observed must be included. For the elderberry and associated native plants, the survival rate, condition, and size of the plants must be analyzed. Real and likely future threats must be addressed along with suggested remedies and preventative measures (e.g. limiting public access, more frequent removal of invasive non-native vegetation, etc.).

A copy of each monitoring report, along with the original field notes, photographs, correspondence, and all other pertinent material, should be deposited at the California Academy of Sciences (Librarian, California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118) by December 31 of the year that monitoring is done and the report is prepared. The Service's Sacramento Fish and Wildlife Office should be provided with a copy of the receipt from the Academy library acknowledging receipt of the material, or the library catalog number assigned to it.

**Access.** Biologists and law enforcement personnel from the California Department of Fish and Game and the Service must be given complete access to the project site to monitor transplanting activities. Personnel from both these agencies must be given complete access to the project and the conservation area to monitor the beetle and its habitat in perpetuity.

### Success Criteria

A minimum survival rate of at least 60 percent of the elderberry plants and 60 percent of the associated native plants must be maintained throughout the monitoring period. Within one year of discovery that survival has dropped below 60 percent, the applicant must replace failed plantings to bring survival above this level. The Service will make any determination as to the



applicant's replacement responsibilities arising from circumstances beyond its control, such as plants damaged or killed as a result of severe flooding or vandalism.

#### Service Contact

These guidelines were prepared by the Endangered Species Division of the Service's Sacramento Fish and Wildlife Office. If you have questions regarding these guidelines or to request a copy of the most recent guidelines, telephone (916) 414-6600, or write to:

U.S. Fish and Wildlife Service  
Ecological Services  
2800 Cottage Way, W-2605  
Sacramento, CA 95825



**Figure 1: Range of the Valley Elderberry Longhorn Beetle**

### Literature Cited

- Barr, C. B. 1991. The distribution, habitat, and status of the valley elderberry longhorn beetle *Desmocerus californicus dimorphus*. U.S. Fish and Wildlife Service; Sacramento, California.
- Holland, R.F. 1986. Preliminary descriptions of the terrestrial natural communities of California. Unpublished Report. State of California, The Resources Agency, Department of Fish and Game, Natural Heritage Division, Sacramento, California.
- USFWS. 1980. Listing the valley elderberry longhorn beetle as a threatened species with critical habitat. Federal Register 45:52803-52807.
- USFWS. 1984. Recovery plan for the valley elderberry longhorn beetle. U.S. Fish and Wildlife Service, Endangered Species Program; Portland, Oregon.

**Table 1: Minimization ratios based on location (riparian vs. non-riparian), stem diameter of affected elderberry plants at ground level, and presence or absence of exit holes.**

Location	Stems (maximum diameter at ground level)	Exit Holes on Shrub Y/N (quantify) <sup>1</sup>	Elderberry Seedling Ratio <sup>2</sup>	Associated Native Plant Ratio <sup>3</sup>
non-riparian	stems > = 1" & = < 3"	No:	1:1	1:1
		Yes:	2:1	2:1
non-riparian	stems > 3" & < 5"	No:	2:1	1:1
		Yes:	4:1	2:1
non-riparian	stems >= 5"	No:	3:1	1:1
		Yes:	6:1	2:1
riparian	stems > = 1" & = < 3"	No:	2:1	1:1
		Yes:	4:1	2:1
riparian	stems > 3" & < 5"	No:	3:1	1:1
		Yes:	6:1	2:1
riparian	stems > = 5"	No:	4:1	1:1
		Yes:	8:1	2:1

<sup>1</sup> All stems measuring one inch or greater in diameter at ground level on a single shrub are considered occupied when exit holes are present anywhere on the shrub.

<sup>2</sup> Ratios in the *Elderberry Seedling Ratio* column correspond to the number of cuttings or seedlings to be planted per elderberry stem (one inch or greater in diameter at ground level) affected by a project.

<sup>3</sup> Ratios in the *Associated Native Plant Ratio* column correspond to the number of associated native species to be planted per elderberry (seedling or cutting) planted.