Appendix A
Biological Data Report

WESTERN AREA POWER ADMINISTRATION

FINAL
BIOLOGICAL DATA REPORT

IN SUPPORT OF

AN ENVIRONMENTAL ASSESSMENT FOR RIGHT-OF-WAY MAINTENANCE IN THE SACRAMENTO VALLEY, CALIFORNIA

AUGUST 2005

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ACRONYMS AND ABBREVIATIONS

ANSI ..... American National Standards Institute
BDR ..... biological data report
BO ..... Biological Opinion
cm ..... centimeter(s)
CNDDB ..... California Natural Diversity Database
CVP ..... Central Valley Project
ºC ..... degrees Celsius
ºF ..... degrees Fahrenheit
Delta ..... Sacramento – San Joaquin River Delta
DFG ..... California Department of Fish and Game
DOE ..... U.S. Department of Energy
EA ..... Environmental Assessment
ESU ..... evolutionarily significant unit
ft ..... foot/feet
GPS ..... global positioning system
IVM ..... Integrated Vegetation Management
kV ..... kilovolt(s)
mi ..... mile/miles
mph ..... miles per hour
ppt ..... parts per thousand
RBDD ..... Red Bluff Diversion Dam
ROW ..... right-of-way
SRA ..... shaded riverine aquatic
SWP ..... State Water Project
TDS ..... total dissolved solids
UC ..... University of California
USFWS ..... U.S. Fish and Wildlife Service
USGS ..... U.S. Geological Survey
VELB ..... valley elderberry longhorn beetle
Western ..... Western Area Power Administration
WSCC ..... Western Systems Coordinating Council

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BIOLOGICAL DATA REPORT

1.0 INTRODUCTION

The Western Area Power Administration (Western), a power marketing administration of the U.S. Department of Energy (DOE), owns, operates, and maintains all or a portion of six 230-kilovolt (kV) transmission lines and one 115-kV transmission line in Placer, Sacramento, and Sutter Counties, California.

Western must comply with the National Electric Safety Code, Western Systems Coordinating Council (WSCC), and Western directives for protecting human safety and maintaining the reliable operation of the transmission system. Western needs to maintain its transmission line rights-of-way (ROWs) and access roads to allow crews and equipment entry to the ROWs for inspection, maintenance, and repair activities. Vegetation growing in the ROW could create a safety hazard to line crews and the public, as well as interfere with the reliable transmission of electricity. Western's Power System Maintenance Manual and the *Integrated Vegetation Management (IVM) Environmental Guidance Manual* (Western 2003) provide the policies and directions for maintaining the ROWs throughout the agency.

Western has a Biological Opinion (BO) from the U.S. Fish and Wildlife Service (USFWS) addressing current routine right-of-way (ROW) maintenance practices for these transmission lines (USFWS 1998). The BO identifies threatened and endangered species and their habitats and identifies avoidance measures to apply based on Western's current routine ROW maintenance methods. However, Western proposes expanding the scope of these maintenance methods. Western has prepared the Final *Environmental Assessment* (EA) *for Right-of-Way Maintenance in the Sacramento Valley, California* to support further *Endangered Species Act* Section 7 consultation that is required when Western conducts maintenance activities that are beyond those covered in the BO. On March 30, 2005, the USFWS released a new BO (USFWS 2005) covering these new activities, to be tiered under the 1998 BO. This biological data report (BDR) supports the EA and the biological assessment. The BDR also supported the Section 7 consultation with the USFWS.

To support the EA, a biological survey was conducted from September 11 through December 10, 2001. Two-person survey teams consisted of a biologist familiar with habitats and threatened and endangered species in the study area and a field technician responsible for operation of a handheld data collection device with an attached global positioning system (GPS) receiver. A meandering pedestrian survey of the entire 108 miles (mi) of transmission line and access road ROWs recorded the locations of a variety of features of biological importance, including

- Rivers and streams;
- Wetlands, including vernal pools; and
- Habitats of threatened and endangered species.

Biological surveys were habitat-based, although any significant biological observations (for example, wildlife encountered) were noted. Recorded features were also accompanied by comments, for example, describing species present and density of a particular vegetation community. Before conducting fieldwork, Western collected and examined data on threatened and endangered species that may occur within the study area, including California Natural Diversity Database (CNDDB) records and the USFWS BO (USFWS 1998b). The survey methodology and timing were discussed in advance with the USFWS to ensure that the data quality would be appropriate to support the EA (Nagano et al. 2001).

This survey was conducted primarily to provide information for the EA. Secondarily, it will allow Western to identify and avoid sensitive habitats and resources. Periodic follow-up surveys would be conducted to account for changing conditions along the ROW.

The survey determined that

- Several locations on the ROWs contain elderberry bushes (*Sambucus spp.)* that provide habitat for the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), a Federally listed threatened species;
- Vernal pools are present along several transmission line ROWs; and
- Other threatened species may be present along the ROWs.

1.1 PROJECT DESCRIPTION

The EA evaluates ROW maintenance along eight transmission line ROWs (Table 1-1) and approximately 10 mi of associated access roads in the Sacramento Valley. Transmission line ROW widths vary from 125 feet (ft) to 250 ft, while legal access road ROWs are 30 ft wide. All transmission lines evaluated lie within Sutter, Placer, and Sacramento Counties.

The EA evaluates the no-action alternative and the proposed action, summarized as follows:

- **No-Action Alternative.** Under the no-action alternative, Western would continue its current ROW maintenance practices. The management approach to controlling vegetation and ensuring access is need-driven. Methods to control vegetation are manual and mechanical. Current practices would also be used to maintain access roads, transmission lines and associated structures, hardware, and equipment.
- **Proposed Action.** Under the proposed action, Western would adopt the management approach of promoting low-growing plant communities. To achieve this objective, Western would extend the set of vegetation maintenance methods available to include expanded use of herbicides in combination with manual and mechanical methods. Western would largely continue its current practices for maintenance of access roads, transmission lines and associated structures, hardware, and equipment. Additional activities covered under the proposed action are soil borings and placing rocks around existing culverts, existing towers, or existing structures. The proposed action would be cost-effective and would ensure that system reliability and safety remain at acceptable levels, while extending the lifetime of transmission components.

Potential impacts to special status species from the no-action alternative or proposed action fall into two broad categories: alteration of existing habitats through trimming, removal,

Table 1-1. Transmission Lines in the Study Area

Transmission Line	Start Point	End Point	Length of Transmission Line (mi) [a]	Kilovolts
Elverta-Hurley No. 1 and No. 2 [b]	Elverta Substation	Hurley Substation	10.99 (No. 1) and 10.73 (No. 2)	230
Hurley-Tracy No. 1 and No. 2 [b]	Hurley Substation	Study area ends at Sacramento/San Joaquin County Line. Line continues to Tracy Substation	24.66 within study area. 61.54 (No. 1) and 61.30 (No. 2) total to Tracy Substation.	230
Folsom-Nimbus	Folsom Substation	Nimbus Powerplant	6.62	115
Folsom-Roseville	Folsom Substation	Roseville Substation	7.10	230
Roseville-Elverta (consists of two separate lines, Roseville-Fiddyment and Fiddyment-Elverta)	Roseville Substation	Elverta Substation	12.10	230
Cottonwood-Roseville	Study area begins at Sutter/Yuba County Line. Transmission line begins at Cottonwood Substation.	Roseville Substation	28.34 within study area. 137.04 total to Cottonwood Substation.	230
O'Banion-Elverta No. 1 and No. 2 [b]	O'Banion Substation	Elverta Substation	26.00 (No. 1 and No. 2)	230

[a] Length of transmission line is from origin to endpoint, including portions within substations or generating facilities
[b] The Elverta-Hurley, Hurley-Tracy, and O'Banion-Elverta transmission line ROWs contain double-circuit towers—separate transmission lines, denoted as No. 1 and No. 2, share the same towers within the ROW.

planting of vegetation, and use of herbicides; and disturbance of species from equipment used in the vegetation management process, access road repair/reconstruction, and transmission line maintenance. Avoidance measures are incorporated into the no-action alternative and the proposed action to minimize these impacts. Primarily, avoidance involves an intense effort to identify and avoid habitats of threatened or endangered species. If habitat must be disturbed, measures are prescribed to reduce impacts based on the type of habitat and species of concern (for example, avoiding disturbance at particular times of the year).

1.2 OBJECTIVES OF THIS REPORT

This BDR evaluates effects on species listed and proposed for listing under the Federal and State endangered species acts. The specific objectives of this report are to

- Identify Federally listed and State-listed species and species that may occur in the project area,
- Determine the occurrence of these species and their habitats in areas to be affected by project activities,

- Evaluate the effects of the no-action alternative and the proposed action on these species and their habitats, and
- Identify measures that could avoid, minimize, or compensate for effects.

2.0 SELECTION OF SPECIES TO BE ADDRESSED

The species addressed in this report were identified from lists provided by the USFWS and a search of the CNDDB. In May 2005, a species list was obtained from the USFWS that included all of the listed and proposed species that may occur in the project area (Appendix B). A CNDDB search was performed in June and October 2001 for all U.S. Geological Survey (USGS) 7.5-minute quadrangle maps in which the various ROWs are located (CNDDB 2001). These maps include those for Carmichael, Elk Grove, Folsom, Galt, Gilsizer Slough, Lodi North, Nicolaus, Pleasant Grove, Rio Linda, Rocklin, Roseville, Sacramento East, Sheridan, Sutter Causeway, and Verona.

Project effects were assessed based on the following:

- Type and extent of project activities (Table 2-1),
- Presence of target species or their habitat, and
- Documented scarcity and sensitivity of target species.

Table 2-2 identifies the listed and proposed species that could be affected by project-related actions, as well as the species status, distribution in California, habitat requirements, and reasons for decline or concern. Species identified in Table 2-2 are analyzed in detail in Chapters 3 through 18. Table 2-3 identifies the listed and proposed species that do not occur within the project area or that would not be affected by project-related activities. A summary of the reasons these species will not be analyzed further in this document is provided in Table 2-3, as well as in Chapter 19.

Table 2-1. Comparison of ROW Maintenance Methods, Equipment, Techniques/Activities, and Applications Analyzed in this Environmental Assessment for the No-Action Alternative and Proposed Action

No-Action Alternative or Proposed Action	Method	Example Equipment [a]	Technique/Activity [a]	Applications [a]
Vegetation Maintenance (Transmission Line and Access Road ROWs)				
No-Action Alternative *Need-driven management approach to trim, mow, clear, remove, and dispose of vegetation as control needs are identified through periodic line patrols*	Manual	Chainsaw, clipper, axe, pickup trucks, chippers	Trimming, removal, disposal, placement of geotextile barriers	Selective vegetation removal and disposal
	Mechanical	Heavy-duty mowers (brush-hog, Hydro-Ax), crawler tractors, chippers	Mowing, removal, disposal	Temporary control of thick stands of vegetation
Proposed Action *Management approach promotes low-growing plant communities. This would require more intense work in the short term to establish low-growth communities, but diminished work in the long term.*	Manual	Chainsaw, clipper, axe, pickup trucks, chippers	Trimming, removal, disposal, placement of geotextile barriers	Selective vegetation removal and disposal
	Mechanical	Heavy-duty mowers (brush-hog, Hydro-Ax), crawler tractors, chippers	Mowing, removal, disposal	Temporary control of thick stands of vegetation
	Herbicides (Western-approved and registered for use in California)	Hand sprayers, power sprayers, herbicide appropriate for technique and application	Spot, localized, broadcast	Spot treatments where selective elimination of species is desirable. Localized treatment on ROWs with low-to-medium target plant density. Broadcast for treating large/dense areas of ROW vegetation, especially where access by truck is readily available.

Table 2-1. Comparison of ROW Maintenance Methods, Equipment, Techniques/Activities, and Applications Analyzed in this Environmental Assessment for the No-Action Alternative and Proposed Action (continued)

No-Action Alternative or Proposed Action	Method	Example Equipment [a]	Technique/Activity [a]	Applications [a]
Access Road Maintenance				
No-Action Alternative	Repairing	Bulldozer, caterpillar (tracked vehicle), dump truck, backhoe	Specific to type of repair	Specific to type of repair
	Grading	Bulldozer, caterpillar	Removal and leveling of upper levels of soil profile	Used to construct or repair road surface
	Filling	Dump truck	Delivery of gravel, rock, or soil to fill depressions	Filling of depressions during initial or reconstruction of road
	Cleaning water crossings	Backhoe, dump truck	Removal of debris from culverts and ditches	To maintain optimal efficiency of water diversions to prevent washouts and erosion
	Repair or construction of water bars	Backhoe, dump truck, bulldozer	Grading and shaping of soil to construct/repair a berm to control erosion	Direct water off road surface to prevent washouts or erosion
	Repair or construction of v-shaped ditches	Backhoe	Construction of ditches to allow drainage	Direct water off road surface to prevent washouts or erosion
	Construction or replacement of culverts	Backhoe, truck, trailers	Installation of pipe culvert under across road	Used whenever drainages or streams are of sufficient size

Table 2-1. Comparison of ROW Maintenance Methods, Equipment, Techniques/Activities, and Applications Analyzed in this Environmental Assessment for the No-Action Alternative and Proposed Action (continued)

No-Action Alternative or Proposed Action	Method	Example Equipment [a]	Technique/Activity [a]	Applications [a]
Access Road Maintenance (continued)				
Proposed Action	Repairing	Bulldozer, caterpillar (tracked vehicle), dump truck, backhoe	Specific to type of repair	Specific to type of repair
	Grading	Bulldozer, caterpillar	Removal and leveling of upper levels of soil profile	Used to construct or repair road surface
	Filling	Dump truck	Delivery of gravel, rock, or soil to fill depressions	Filling of depressions during initial or reconstruction of road
	Cleaning water crossings	Backhoe, dump truck	Removal of debris from culverts and ditches	To maintain optimal efficiency of water diversions to prevent washouts and erosion
	Repair or construction of water bars	Backhoe, dump truck, bulldozer	Grading and shaping of soil to construct/repair a berm to control erosion	Direct water off road surface to prevent washouts or erosion
	Repair or construction of v-shaped ditches	Backhoe	Construction of ditches to allow drainage	Direct water off road surface to prevent washouts or erosion
	Construction or replacement of culverts	Backhoe, truck, trailers	Installation of pipe culvert under across road	Used whenever drainages or streams are of sufficient size

Table 2-1. Comparison of ROW Maintenance Methods, Equipment, Techniques/Activities, and Applications Analyzed in this Environmental Assessment for the No-Action Alternative and Proposed Action (continued)

No-Action Alternative or Proposed Action	Method	Example Equipment [a]	Technique/Activity [a]	Applications [a]
Transmission Line Maintenance				
No-Action Alternative	Patrols (aerial)	Helicopter	General visual observation of entire transmission system performed on quarterly basis	Locate damaged or malfunctioning equipment that may cause additional damage if left for a longer period of time; check for "danger trees" or encroaching vegetation
	Patrols (ground)	Pickup truck	Detailed observation of entire transmission system performed on semi-annual basis	Check access to towers/poles, tree clearances, fences, gates, locks, and tower hardware
	Inspection (climbing)	Pickup truck, bucket truck	Detailed observation of system hardware performed on 20 percent of structures each year	Identify deterioration of hardware not detected in aerial or ground inspections
	Repairs and preventative maintenance	Pickup truck, bulldozer, caterpillar, backhoe, bucket truck, hand tools	Based on needs identified during inspections or other reports, replace insulators; tighten, replace, or repair towers/poles or hardware; look for ROW encroachments	Performed wherever damage or deterioration of transmission lines or facilities poses a threat to safety or reliability
	Underground water, power, communication, or ground electrical line	Pickup truck, bulldozer, caterpillar, backhoe, bucket truck, hand tools	Based on needs identified during inspections or other reports, install, replace, or repair underground components related to transmission lines or substations	Performed wherever damage or deterioration of underground components poses a threat to safety or reliability, or where new components are necessary for optimal system operation and safety

Table 2-1. Comparison of ROW Maintenance Methods, Equipment, Techniques/Activities, and Applications Analyzed in this Environmental Assessment for the No-Action Alternative and Proposed Action (continued)

No-Action Alternative or Proposed Action	Method	Example Equipment [a]	Technique/Activity [a]	Applications [a]
Transmission Line Maintenance (continued)				
Proposed Action	Patrols (aerial)	Helicopter	General visual observation of entire transmission system performed on quarterly basis	Locate damaged or malfunctioning equipment that may cause additional damage if left for a longer period of time; check for "danger trees" or encroaching vegetation
	Patrols (ground)	Pickup truck	Detailed observation of entire transmission system performed on semi-annual basis	Check access to towers/poles, tree clearances, fences, gates, locks, and tower hardware
	Inspection (climbing)	Pickup truck, bucket truck	Detailed observation of system hardware performed on 20 percent of structures each year	Identify deterioration of hardware not detected in aerial or ground inspections
	Repairs and preventative maintenance	Pickup truck, bulldozer, caterpillar, backhoe, bucket truck, hand tools	Based on needs identified during inspections or other reports, replace insulators; tighten, replace, or repair towers/poles or hardware; look for ROW encroachments	Performed wherever damage or deterioration of transmission lines or facilities poses a threat to safety or reliability
	Underground water, power, communication, or ground electrical line	Pickup truck, bulldozer, caterpillar, backhoe, bucket truck, hand tools	Based on needs identified during inspections or other reports, install, replace, or repair underground components related to transmission lines or substations	Performed wherever damage or deterioration of underground components poses a threat to safety or reliability, or where new components are necessary for optimal system operation and safety
	Soil borings from surface to 100 ft deep	Pickup truck, mobile drill rig (rubber-tired truck with outriggers), van for sample management	Direct-push or auger drilling with sample recovery	Subsurface soil recovery for geotechnical or environmental analyses

[a] Note that equipment, activities, and applications are typical, but not all-inclusive. Improvements in technology may result in new types of equipment or broadening of applications.
ROW = right-of-way

Table 2-2. Special Status Species Known to Occur or with Suitable Habitat in the Study Area

Species	Status [a] Federal/ State	Habitat Association	Occurrence in Project Area	Reason for Decline or Concern	Potential for Effect	Avoidance Measures
Vernal Pool Species (plants)						
Gratiola heterosepala Boggs Lake hedge-hyssop	--/E	Clay soils in areas of shallow water, lake margins and vernal pool margins	Folsom-Nimbus, Folsom-Roseville, Roseville-Elverta, OBanion -Elverta, Hurley-Tracy	Agricultural conversion and urban development	Disturbance or destruction of habitat by equipment during maintenance activities; adverse effects from herbicides	Identification and avoidance of habitat where possible; herbicide use buffer zones
Orcuttia tenuis Slender orcutt grass	T/ E	Vernal pools, generally between 650 3,600 feet	Folsom-Nimbus, Folsom-Roseville, Roseville-Elverta, OBanion -Elverta, Hurley-Tracy	Agricultural conversion and urban development	Disturbance or destruction of habitat by equipment during maintenance activities; adverse effects from herbicides	Identification and avoidance of habitat where possible; herbicide use buffer zones
Orcuttia viscida Sacramento orcutt grass	E/E	Vernal pools below 330 feet	Folsom-Nimbus, Folsom-Roseville, Roseville-Elverta, OBanion -Elverta, Hurley-Tracy	Agricultural conversion and urban development	Disturbance or destruction of habitat by equipment during maintenance activities; adverse effects from herbicides	Identification and avoidance of habitat where possible; herbicide use buffer zones
Vernal Pool Species (invertebrates)						
Lepidurus packardi Vernal pool tadpole shrimp	E/--	Vernal pools; ephemeral stock ponds	Folsom-Nimbus, Folsom-Roseville, Roseville-Elverta, OBanion -Elverta, Hurley-Tracy	Habitat loss to agriculture and urban development	Disturbance or destruction of vernal pools by equipment during maintenance activities; adverse effects from herbicides	Identification and avoidance of habitat where possible; herbicide use buffer zones
Branchinecta lynchi Vernal pool fairy shrimp	T/--	Vernal pools and other seasonal freshwater wetlands	Folsom-Nimbus, Folsom-Roseville, Roseville-Elverta, OBanion -Elverta, Hurley-Tracy	Habitat loss to agriculture and urban development	Disturbance or destruction of vernal pools by equipment during maintenance activities; adverse effects from herbicides	Identification and avoidance of habitat where possible; herbicide use buffer zones

Table 2-2. Special Status Species Known to Occur or with Suitable Habitat in the Study Area (continued)

Species	Status [a] Federal/ State	Habitat Association	Occurrence in Project Area	Reason for Decline or Concern	Potential for Effect	Avoidance Measures
Fish						
Oncorhynchus tshawytscha Winter-run Chinook salmon	E/E	Riverine; cool, clear water with spawning gravel; migrate to the ocean to feed and grow until sexually mature	Hurley-Tracy at American River	Habitat degradation from blockage of adult passage to spawning areas, lethal water temperatures during egg incubation and early rearing	Reduction or elimination of shade trees; increase in turbidity due to erosion	Maintenance and herbicide use buffer zones along waterways
Oncorhynchus tshawytscha Central Valley spring-run Chinook salmon	T/T	Cold, clear water with clean gravel of appropriate size for spawning; most spawning occurs in headwater streams; migrate to the ocean to feed and grow until sexually mature	Hurley-Tracy at American River and Cosumnes River; OBanion - Elverta at Feather River	Habitat degradation, restricted access to spawning habitat	Reduction or elimination of shade trees; increase in turbidity due to erosion	Maintenance and herbicide use buffer zones along waterways
Oncorhynchus mykiss Central Valley steelhead	T/--	Riverine; cold, clear water with clean gravel of appropriate size for spawning; most spawning occurs in headwater streams; steelhead migrate to the ocean to feed and grow until sexually mature	Hurley-Tracy at American River and Cosumnes River; OBanion - Elverta at Feather River	Habitat degradation, restricted access to spawning habitat; increased water temperatures and sedimentation; decreased water quality; flow alterations	Reduction or elimination of shade trees; increase in turbidity due to erosion	Maintenance and herbicide use buffer zones along waterways

Table 2-2. Special Status Species Known to Occur or with Suitable Habitat in the Study Area (continued)

Species	Status [a] Federal/ State	Habitat Association	Occurrence in Project Area	Reason for Decline or Concern	Potential for Effect	Avoidance Measures
Invertebrates						
Desmocerus californicus dimorphus Valley elderberry longhorn beetle	T/--	Elderberry savanna, riparian, and oak savanna habitats with elderberry shrubs	Folsom-Nimbus, Folsom-Roseville, Cottonwood-Roseville, Elverta-Hurley, Hurley-Tracy	Loss and fragmentation of riparian habitats	Loss of habitat by removal of elderberry shrubs; habitat fragmentation	Elderberry removal to be compensated with mitigation credits and research
Amphibians						
Ambystoma californiense California tiger salamander	T/SSC	Grasslands and low (under 1,500-foot) foothill regions where lowland aquatic sites are available for breeding. Prefer natural ephemeral pools or ponds that mimic them (e.g., stock ponds that are allowed to go dry)	Hurley-Tracy	Loss and fragmentation of habitat from human activities and the encroachment of nonnative predators	Adverse effects from glyphosate-based herbicides; direct effects from maintenance crews or equipment	Vernal pool and aquatic buffer zones; maintenance crew education on identification of suitable habitat and avoidance procedures
Reptiles						
Thamnophis gigas Giant garter snake	T/T	Sloughs, canals, and other small waterways where there is a prey base of small fish and amphibians; requires grass banks and emergent vegetation for basking and areas of high ground protected from flooding during winter	OBanion -Elverta, Elverta-Hurley, Hurley-Tracy, Cottonwood-Roseville	Loss of habitat from agriculture and urban development	Increase in turbidity due to erosion; adverse effects from herbicides	Seasonal restrictions on maintenance activities in potential habitat; maintenance crew education on identification of suitable habitat and avoidance procedures

Table 2-2. Special Status Species Known to Occur or with Suitable Habitat in the Study Area (continued)

Species	Status [a] Federal/ State	Habitat Association	Occurrence in Project Area	Reason for Decline or Concern	Potential for Effect	Avoidance Measures
Birds						
Buteo swainsoni (Nesting) Swainsons hawk	--/T	Nests in oak or cottonwoods in or near riparian habitats; forages in grasslands, irrigated pastures, and grain fields	Hurley-Tracy, OBanion -Elverta, Cottonwood-Roseville	Loss of riparian, agriculture and grassland habitats; vulnerable to human disturbance at nest sites Nests along Sacramento River, Natomas Basin, and the Yolo Bypass	Potential direct effects on nest sites because of tree removal or trimming; potential disturbance to nest sites and foraging areas	Education on identification and avoidance of raptor nests and identification of suitable Swainsons hawk habitat; establish 200-ft buffer around active nests for maintenance activities
Coccyzus americanus occidentalis (nesting) Western yellow-billed cuckoo	--/E	Wide dense riparian forests with a thick understory of willows for nesting; sites with a dominant cottonwood overstory are preferred for foraging; may avoid valley oak riparian habitats where scrub jays are abundant	OBanion -Elverta	Loss of riparian habitat to agriculture and water control development; possible pesticide contamination	Potential direct effects on nest sites because of tree removal or trimming; potential disturbance to nest sites and foraging areas	None: no suitable habitat identified in study area
Riparia riparia (nesting) Bank swallow	--/T	Nests in bluffs or banks, usually adjacent to water, where the soil consists or sand or sandy loam to allow digging	Hurley-Tracy	Loss of natural earthen banks to bank protection and flood control; erosion control related to stream regulation by dams	Potential effects from ground-disturbing activities on nesting sites along the American River	No ground disturbing activities in potential nesting area

Table 2-2. Special Status Species Known to Occur or with Suitable Habitat in the Study Area (concluded)

Species	Status [a] Federal/ State	Habitat Association	Occurrence in Project Area	Reason for Decline or Concern	Potential for Effect	Avoidance Measures
Mammals						
Sylvilagus bachmani riparius Riparian brush rabbit	E/E	Dense, brushy areas of riparian forests above flood level	Hurley-Tracy	Loss of riparian habitat due to agriculture and water control development	No known occurrences in the project area; loss of habitat	Promote growth of brush elements of riparian habitat
Neotoma fuscipes riparia Riparian (San Joaquin Valley) woodrat	E/SSC	Riparian habitats where trees and brush are available for cover and nesting	Hurley-Tracy	Loss of riparian habitat, limited range	No known occurrences in the project area; loss of habitat	Promote growth of brush elements of riparian habitat

Sources: CNDDB 2001, USFWS 2001

[a] Status explanations:

Federal

E = listed as endangered under the Federal *Endangered Species Act*
T = listed as threatened under the Federal *Endangered Species Act*
-- = no listing

State

E = listed as endangered under the California *Endangered Species Act*
T = listed as threatened under the California *Endangered Species Act*
SSC = species of special concern in California
-- = no listing

Table 2-3. Listed and Proposed Species not Likely to be Affected by Right-of-Way Maintenance Activities in the Study Area

Species	Source [a]	Status [b] Federal/ State	California Distribution	Habitats	Reason for Decline or Concern	Potential for Effect
Invertebrates						
Branchinecta conservatio Conservancy fairy shrimp	USFWS	E/ --	Disjunct occurrences in Solano, Merced, Tehama, Butte, and Glenn Counties	Vernal pools and other seasonal freshwater wetlands	Habitat loss to agriculture and urban development	No known occurrences in the project area
Elaphrus viridis Delta green ground beetle	CNDDB	T/--	Restricted to Olcott Lake and other vernal pools at Jepson Prairie Preserve, Solano County	Sparsely vegetated edges of vernal lakes and pools	Limited range	No known occurrences in the project area
Fish						
Oncorhynchus (=Salmo) clarki henshawi Lahontan cutthroat trout	USFWS	T/ --	Native to the Lahontan basin of mid-eastern California. Present distribution is restricted to a few lakes and streams within and outside the historic range including the Truckee, Carson, and Walker River Basins, and Yuba, Stanislaus, San Joaquin, and Owens River Systems	Small streams characterized by cool water, pools in close proximity to cover and velocity breaks, well vegetated and stable stream banks, and relatively silt free, rocky substrate in riffle-run areas.	Urban and mining development; water diversions; poor water quality; hybridization with non-native trout; and, competition with introduced species of fish.	No known occurrences in the project area

Table 2-3. Listed and Proposed Species not Likely to be Affected by Right-of-Way Maintenance Activities in the Study Area (continued)

Species	Source [a]	Status [b] Federal/ State	California Distribution	Habitats	Reason for Decline or Concern	Potential for Effect
Birds						
Charadrius montanus (wintering) Mountain plover	Both	PT/ -	Does not breed in California, in winter found in the Central Valley south of Yuba County, along the coast in parts of San Luis Obispo, Santa Barbara, Ventura, and San Diego Counties; parts of Imperial, Riverside, Kern and Los Angeles Counties	Occupies open plains or rolling hills with short grasses or very sparse vegetation; nearby bodies of water are not needed; may use newly plowed or sprouting grain fields	Loss of habitat to agriculture and urban development; declines of Californias wintering population may be attributable to disturbance of breeding population	No occurrences in the project area recorded in CNDDB
Haliaeetus leucocephalus (nesting and wintering) Bald eagle	Both	PD/ E	Nests in Siskiyou, Modoc, Trinity, Shasta, Lassen, Plumas, Butte, Tehama, Lake and Mendocino Counties and in the Lake Tahoe Basin; reintroduced into central coast; winter range includes the rest of California, except the southeastern deserts, very high altitudes in the Sierras, the east of the Sierra Nevada south of Mono County, range expanding	In western North America nests and roosts in coniferous forests within 1 mile of a lake, reservoir, river or the ocean	Nest sites vulnerable to human disturbance; pesticide contamination	Winters in the project area. Project activities provide no potential for effect.

Table 2-3. Listed and Proposed Species not Likely to be Affected by Right-of-Way Maintenance Activities in the Study Area (continued)

Species	Source [a]	Status [b] Federal/ State	California Distribution	Habitats	Reason for Decline or Concern	Potential for Effect
Plants						
Berberis sonnei Truckee barberry	USFWS	E/E	Upper banks of the Truckee River in the town of Truckee, Nevada County	Alluvial granitic soils along river banks	Limited range	No occurrences in the project area
Castilleja campestris ssp. Succulenta Succulent Owl's-clover	USFWS	T/E	Valley grassland areas of the San Joaquin Valley at the base of the Sierra Nevada foothills	Drying vernal pools	Loss of habitat to agriculture and urban development	No occurrences in the project area
Oenothera deltoides ssp. howellii Antioch Dunes evening-primrose	USFWS	E/ E	Antioch Dunes, south of the confluence of the Sacramento and San Joaquin Rivers	Loose or semi-stabilized sand	Industrial development, sand mining, and agricultural conversion	No occurrences in the project area

Table 2-3. Listed and Proposed Species not Likely to be Affected by Right-of-Way Maintenance Activities in the Study Area (concluded)

Species	Source [a]	Status [b] Federal/ State	California Distribution	Habitats	Reason for Decline or Concern	Potential for Effect
Pseudobahia bahiifolia Hartwegs golden sunburst	USFWS	E/ E	Eastern side of Sacramento- San Joaquin Valleys and adjacent foothills, historically as far north as Yuba County	Predominantly on northern slopes of rocky, bare areas along rolling hills, shady creeks, adjacent to vernal pools and streams, on heavy clay soils in grasslands, 50- 500 feet	Agricultural conversion and urban development	No occurrences in the project area; may be extirpated

[a] Sources: CNDDB 2001, USFWS 2001

[b] Status explanations

Federal

E = listed as endangered under the Federal *Endangered Species Act*.
T = listed as threatened under the Federal *Endangered Species Act*.
PD = proposed for delisting under the Federal *Endangered Species Act*.
PT = proposed for Federal listing as threatened under the Federal *Endangered Species Act*.
-- = no listing.

State

E = listed as endangered under the California *Endangered Species Act*.
T = listed as threatened under the California *Endangered Species Act*.
-- = no listing.

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3.0 VALLEY ELDERBERRY LONGHORN BEETLE

3.1 BACKGROUND

3.1.1 STATUS, DISTRIBUTION, AND LIFE HISTORY

The valley elderberry longhorn beetle (VELB) is found primarily in association with its host plant, the elderberry (*Sambucus* spp.) and is Federally listed as a threatened species (USFWS 1980). VELB is not State-listed. This species has probably always been rare (USFWS 1984). As a result, information on the historical distribution and abundance of VELB is scarce. Its range extends from Redding at the northern end of the Central Valley, south to the Bakersfield area (Barr 1991). Along the eastern edge of the species' range, adult beetles have been found in the foothills of the Sierra Nevada at elevations of up to 2,220 ft, and beetle exit holes have been located on elderberry plants at elevations of up to 2,940 ft. Along the western edge of the species' range, adult beetles have been found on the eastern slope of the Coast Ranges at elevations of up to 500 ft, and beetle exit holes have been detected on elderberry plants at elevations of up to 730 ft (Barr 1991).

The elderberry, an obligate host for beetle larvae, is found within or near riparian and oak woodland habitats. The VELB's life history is assumed to follow a sequence of events similar to those of related taxa: female beetles deposit eggs in crevices in the bark of living elderberry plants. Presumably, the eggs hatch shortly after they are laid and the larvae bore into the pith of the trunk or stem. When larvae are ready to pupate, they move through the pith of the plant, open an emergence hole through the bark, and return to the pith for pupation. Adults exit through the emergence holes and can sometimes be found on elderberry foliage, flowers, or stems, or on adjacent vegetation. The entire life cycle of VELB is thought to encompass 2 years, from the time eggs are laid and hatch until adults emerge, lay eggs, and die (USFWS 1984).

The presence of exit holes in elderberry stems indicates previous VELB habitat use. Exit holes are cylindrical and approximately one-quarter inch in diameter. Exit holes are generally found on stems that are 1 or more inches in diameter. The holes may be located on the stems from a few inches to about 9–10 ft above the ground (Barr 1991).

3.1.2 REASON FOR DECLINE

The apparent decline in the VELB population distribution is most likely related to the extensive loss of riparian forests in the Central Valley. This has reduced the amount of habitat available for the species and most likely fragmented the species' range (USFWS 1984). Insecticide drift from cultivated fields and orchards adjacent to elderberry shrubs can affect VELB populations (Barr 1991). Furthermore, herbicide drift from agricultural fields and orchards can likewise affect the health of elderberry shrubs, possibly reducing the quantity and quality of VELB habitat.

3.2 STATUS IN THE PROJECT AREA

Elderberry shrubs are present throughout the project area and grow to heights that can interfere with transmission lines (potential for arcing), obstruct access of maintenance crews to towers, and cause stress to the towers themselves as branches grow around the metal lattice. The biological field survey conducted for the EA recorded the locations of isolated elderberry shrubs as well as elderberry savanna habitat within the ROWs of the Folsom-Nimbus, Folsom-Roseville, Cottonwood-Roseville, Elverta-Hurley, and Hurley-Tracy transmission lines. Exit holes were noted in some shrubs along the same lines. VELBs have been reported in 9 of the 15 study area quadrangle maps (Figure 3-1).

The Elverta-Hurley 230-kV line crosses near the Sacramento River Zone of designated critical habitat for the VELB. Elderberry savanna is found along the southern end of the Elverta-Hurley transmission line and the northern end of the Hurley-Tracy line.

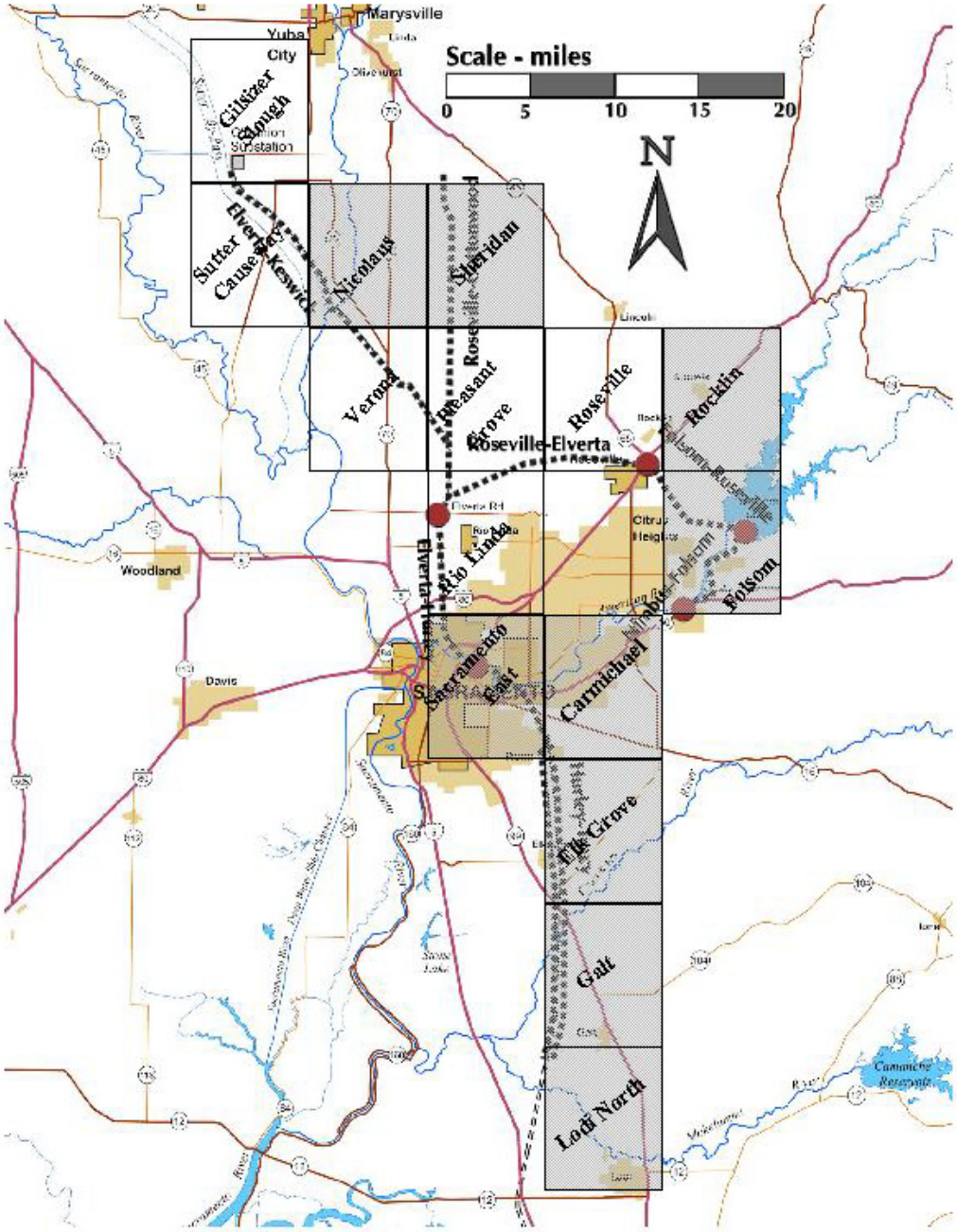
3.3 PROJECT EFFECTS

3.3.1 NO-ACTION ALTERNATIVE

Vegetation Maintenance. Under the no-action alternative, no control of elderberry would take place except for emergency situations. Emergency situations are those where there is an imminent threat to system reliability or public safety. In emergency situations, elderberry removed would be counted toward Western's "incidental take" as specified in Western's programmatic agreement with the USFWS. The incidental take is currently limited to 10 elderberry plants or plant clusters per year for routine maintenance activities within Western's entire California service area (USFWS 1998). Any exceedance of the incidental take would require mitigation according to USFWS conservation guidelines (USFWS 1999). Elderberry could be removed using manual or mechanical methods.

Access Road Maintenance. No VELB habitat was recorded along access roads during the biological survey.

Transmission Line Maintenance. Routine transmission line patrols or ground-disturbing repairs would have the potential to affect VELB habitat; however, mature elderberry shrubs would be identified and avoided.



Source: CNDDB 2001

FIGURE 3-1. REPORTED OCCURRENCES OF VALLEY ELDERBERRY LONGHORN BEETLE IN THE STUDY AREA (SHADED QUADRANGLES)

3.3.2 PROPOSED ACTION

Vegetation Maintenance. The primary objective of Western's IVM Program is to minimize the need for active ROW maintenance by establishing low-growth vegetation communities. Ultimately, this approach results in a more stable habitat and reduces the need for heavy equipment and work crews to disturb the ROW. Fast-growing elderberry shrubs and other deciduous trees that currently require intense maintenance occur in the VELB critical habitat area. Western shall employ the following measures to eliminate adverse effects to the VELB and simultaneously reduce the level of active maintenance necessary along the ROW:

- Manually remove tall-growing species (such as California walnut, California sycamore, and box elder) that are within 20 ft of elderberry shrubs. These trees can interfere with the transmission line; and
- Manually trim elderberry bushes that have the potential to interfere with transmission lines in compliance with guidelines and procedures from American National Standards Institute (ANSI) A300 Part 1. Application of this standard would reduce trauma to the plant and minimize future growth. Trimming would take place above the 10-ft level primarily used by the VELB, as mentioned in the 2005 BO, page 8.

The removal of elderberries within 40 ft of transmission line tower centers and within 20 ft of poles is necessary to ensure system reliability and public safety by preserving structural integrity of transmission line towers, allowing access to the tower perimeter or pole for routine maintenance or repairs, and removing a "path to ground" that could cause arcing. Removal of these elderberries would exceed Western's allowed incidental take specified in the 2005 BO (USFWS 2005). Loss of VELB habitat shall be mitigated according to the USFWS conservation guidelines (USFWS 1999) and the results of formal consultation described below and in the 2005 BO (USFWS 2005). Stumps of removed elderberry would be spot-treated with an herbicide to prevent root sprouting.

Western shall also perform manual trimming of elderberry shrubs between transmission line towers. VELB exit holes have been identified from a few inches to 10 ft above ground level (USFWS 1984, Barr 1991), but usually within 6 ft of the ground (Collinge et al. 2001). More recent investigations have determined that VELB typically do not utilize parts of the bushes that are over 1 meter in height (Huxel 2001). To protect the VELB, Western would restrict its trimming of elderberry to the 10-ft or higher level, consistent with the 2005 BO (USFWS 2005). According to Huxel (personal communication 2001) this would prevent removal of stems containing beetle larvae and allow a full canopy recovery within 2 to 3 years.

Access Road Maintenance. No potential VELB habitat was recorded along access roads during the biological survey.

Transmission Line Maintenance. Routine transmission line patrols or ground-disturbing repairs would have the potential to affect VELB habitat; mature elderberry shrubs would be identified and avoided.

3.4 INTERRELATED AND INTERDEPENDENT ACTIONS AND THEIR EFFECTS

No interrelated or interdependent actions that would affect listed or proposed species have been identified.

3.5 CUMULATIVE EFFECTS

Neither the no-action alternative nor the proposed action would combine with any known State, local, or private actions to result in cumulative impacts.

3.6 MITIGATION

3.6.1 ROW MAINTENANCE ACTIVITIES REQUIRING ELDERBERRY REMOVAL

Under the proposed action, 422 stems, 1-inch or greater diameter, would be removed from areas within 40 ft of tower centers (approximately 20 ft from tower legs) and within 20 ft of poles. This action is necessary for the safety and reliability of the system; elderberry have been observed growing within tower structures and causing stress to towers that could lead to structural failure.

Conservation guidelines for the VELB (USFWS 1999) prescribe minimization ratios as listed in Table 3-1. A survey conducted in January and February, 2002, identified elderberry bushes for removal along Western's ROWs and counted stems according to protocols described in the Conservation Guidelines for the VELB (USFWS 1999). A follow-up survey conducted in April 2004, refined these numbers based on latest site conditions. Results of these surveys and required mitigation are summarized in Table 3-2.

The total elderberry mitigation stems listed in Table 3-2 assumes 100 percent of elderberry stems would be transplanted. Because of concern for safety in working with equipment near transmission lines and the structural integrity of towers, Western may not be able to transplant all elderberry shrubs, and therefore be required to double mitigation for untransplanted stems. Western will evaluate each shrub at the time of removal to determine whether transplant is feasible. Western would add 2.8 acres to the 18.8 acres of compensation area calculated in Table 3-2 to account for 15 percent of plants, with various stem sizes, that would not be feasible to transplant. In addition, Western would perform compensation to cover incidental take of up to 10 elderberry shrub clusters per year as well as trimming elderberry above the 10-ft level. Western would set aside an additional 5 acres for this compensation over the 20-year term of the 1998 programmatic BO (USFWS 1998). The total size of the compensation area under the proposed action is 26.6 acres. If, due to funding or other constraints, Western scales back its maintenance program and decides not to remove some shrubs, the compensation acreage would be adjusted accordingly.

Table 3-1. Minimization Ratios Based on Location, Stem Diameter, and Presence or Absence of Exit Holes

Location	Stems (maximum diameter at ground level in inches)	Exit Holes	Elderberry Seedling Ratio	Associated Native Plant Ratio
Non-riparian	≥ 1 & ≤ 3	No	1:1	1:1
		Yes	2:1	2:1
Non-riparian	> 3 & < 5	No	2:1	1:1
		Yes	4:1	2:1
Non-riparian	≥ 5	No	3:1	1:1
		Yes	6:1	2:1
Riparian	≥ 1 & ≤ 3	No	2:1	1:1
		Yes	4:1	2:1
Riparian	> 3 & < 5	No	3:1	1:1
		Yes	6:1	2:1
Riparian	≥ 5	No	4:1	1:1
		Yes	8:1	2:1

Source: USFWS 1999

Table 3-2. Summary of Required VELB Mitigation under the Proposed Action

	Riparian						Non-Riparian		
	Exit Holes [a]			No Exit Holes [a]			No Exit Holes [a]		
Stem Size	*Count*	*Multiplier*	*Mitigation*	*Count*	*Multiplier*	*Mitigation*	*Count*	*Multiplier*	*Mitigation*
1"-3"	107	4	428	141	2	282	6	1	6
>3" to <5"	80	6	480	40	3	120	3	2	6
5" and greater	40	8	320	5	4	20	0	3	0
Totals			1228			422			12
								Total Elderberry Mitigation Stems	1662
								Native Plants	2890
								Total Plants	4552
								Total Elderberry Mitigation Units (1999 Conservation Guidelines)	455
								Total Elderberry Mitigation Acres (1999 Conservation Guidelines)	18.8
								15-Percent Contingency for Non-transplanted Shrubs	2.8
								Acres to Compensate for Additional Take and Trimming	5.0
								Total Elderberry Mitigation Acres	26.6

[a] During the surveys, counts of exit holes were based on plant groupings, which could include multiple plants; if exit holes were noted in one stem, the entire group of plants was counted as having exit holes. As the conservation guidelines specify exit hole counts based on individual plants, actual mitigation required may be less than shown in the table if not all plants within a group contain exit holes. Exit hole determination would be made at the time of plant removal.

Western has negotiated with the County of Sacramento to restore VELB habitat along the American River Parkway in return for payment. The compensation area would be located near Western's ROW between Business I-80 and SR-160 north of the American River. This area is a former agricultural field that currently contains non-native herbaceous grasses and star thistle. However, native vegetation is adjacent to the field. Western would contract with a qualified third party to remove non-native vegetation and prepare the compensation site for planting, and perform the following tasks in accordance with Conservation Guidelines for the VELB (USFWS 1999):

- Remove elderberry from current locations, transport to the compensation area, and replant;
- Plant appropriate ratios of elderberry seedlings and associated native species;
- Provide long-term protection, weed control, litter control, fencing, and signage;
- Monitor and develop survey reports over a period of 10 consecutive years or 7 years over a 15-year period; and
- Replace failed plantings if the survival rate drops below 60 percent during the first year.

A total of 411 of the 422 stems to be removed under the Proposed Action are located in the American River Parkway within 3 miles of the mitigation area.

No conservation easement is necessary given the land use plan already in place for the American River Parkway, which is protective of VELB habitat. The County of Sacramento would maintain the area in perpetuity according to this land use plan.

The proposed mitigation would enhance opportunities for survival of the VELB for the following reasons (Holyoak 2004, personal communication)

- Because the VELB is a poor colonist (limited dispersal characteristics), the location of the mitigation area adjacent to riparian habitat with demonstrated VELB presence will increase the prospects for VELB migration to the mitigation area;
- Because the site is demonstrably suitable for elderberry, a low mortality rate for elderberry plants is expected; and
- The mitigation site itself is a contiguous area providing better opportunity for the VELB to colonize.

More information on VELB mitigation is contained within the accompanying Mitigation Action Plan.

3.6.2 ROUTINE ROW MAINTENANCE ACTIVITIES WITHIN THE VALLEY ELDERBERRY LONGHORN BEETLE HABITAT

For other ROW maintenance activities in areas of VELB habitat, Western would

- Fence and flag all areas to be avoided during maintenance activities;
- Brief contractors on the need to avoid damaging the elderberry plants and the possible penalties for not complying with these requirements;
- Erect signs every 50 ft 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 ft, and must be maintained for the duration of construction;

- Instruct work crews about the status of the beetle and the need to protect its elderberry host plant; and
- Avoid use of insecticides, herbicides, fertilizers, or hazardous chemicals within established buffer zones.

4.0 VERNAL POOL TADPOLE SHRIMP

4.1 BACKGROUND

4.1.1 STATUS, DISTRIBUTION, AND LIFE HISTORY

The vernal pool tadpole shrimp is Federally listed as an endangered species (USFWS 1994b). This species is not State-listed. The vernal pool tadpole shrimp is found in suitable habitats in the Central Valley from Shasta County to Merced (USFWS 1994b). Vernal pool tadpole shrimp are restricted to vernal wetlands (such as vernal pools and swales) and ephemeral stock ponds in California. This species is not known to occur in riverine or marine habitats or in other permanent bodies of water (USFWS 1994b).

Vernal pool complexes are found in grass-bottomed swales on old alluvial soils that are underlain by hardpan or in mud-bottomed pools that contain highly turbid water (USFWS 1994b). The species has also been observed in stock ponds and other seasonal wetlands. Pools that are occupied by the species typically have low conductivity, total dissolved solids (TDS), and alkalinity (USFWS 1994b). Vernal pool tadpole shrimp often occur with the Conservancy fairy shrimp, vernal pool fairy shrimp, and California linderiella (USACE 2001).

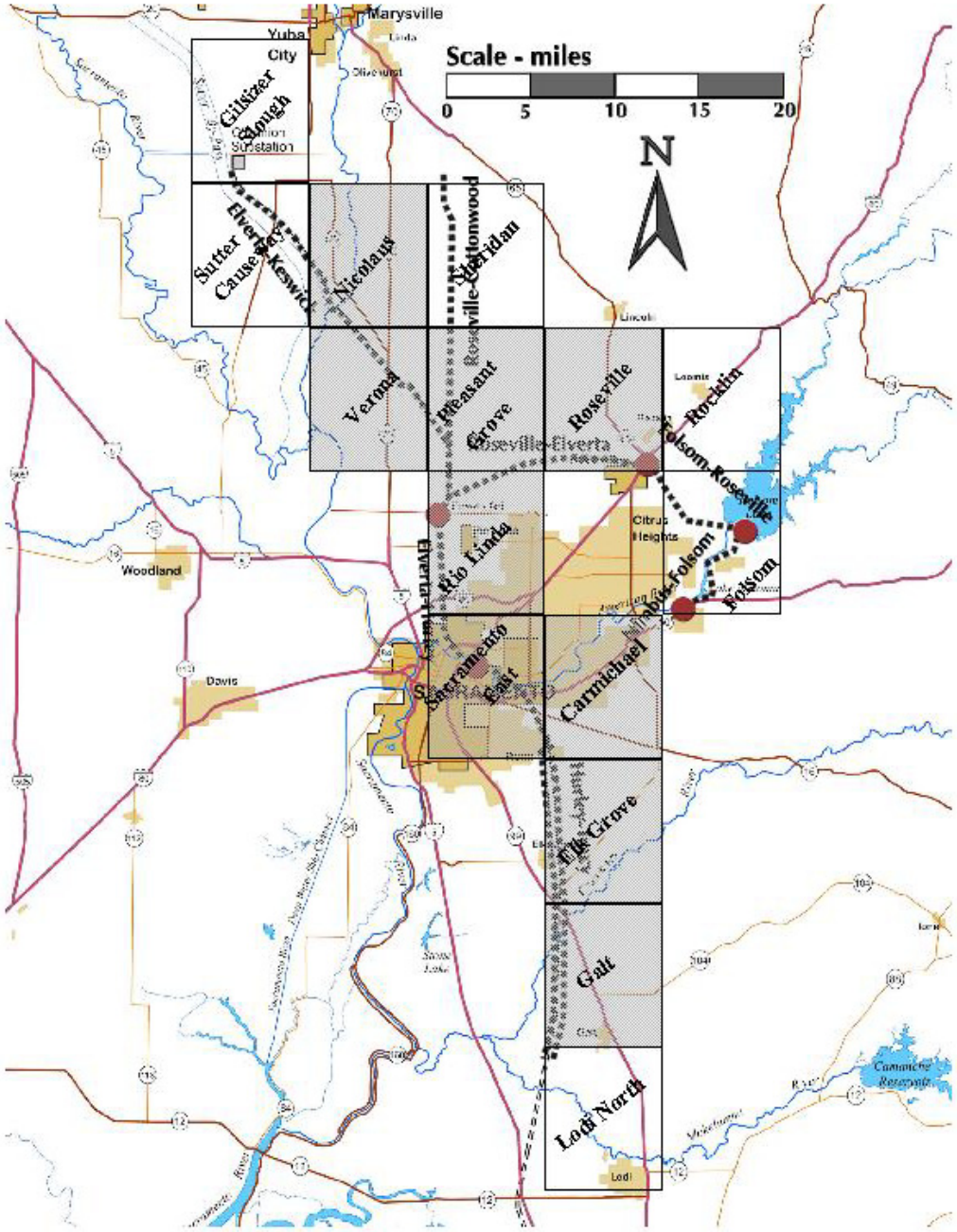
The vernal pool tadpole shrimp's life history is linked to the phenological characteristics of its vernal pool habitat. When pools are dry, the species' diapaused eggs lie dormant in the dry pool sediments. After winter rainwater fills the pools, populations of the species are reestablished from the diapaused eggs (Lanway 1974, Ahl 1991). Unlike the eggs of many of the fairy shrimp species, the eggs of the vernal pool tadpole shrimp do not require a freezing or drying period to hatch (Ahl 1991). Adult shrimp are often present and reproductive in vernal pools until the pools dry up in spring (Ahl 1991, USFWS 1994b). Vernal pool tadpole shrimp mature slowly and are long-lived (Ahl 1991).

4.1.2 REASON FOR DECLINE

The loss of vernal wetlands is the primary cause for the decline of the vernal pool tadpole shrimp. An estimated 90 percent of the suitable habitat for this species has been altered by human activities (such as commercial and residential development, agricultural development, off-road vehicle use, water development projects, and flood control projects). The alteration of vernal pool watersheds caused by modification of surrounding uplands has also resulted in a loss of suitable habitat (USFWS 1994b).

4.2 STATUS IN THE PROJECT AREA

During the biological survey, vernal pools were recorded along the Folsom-Nimbus, Folsom-Roseville, Cottonwood-Roseville, Roseville-Elverta, Hurley-Tracy, and O'Banion-Elverta lines during the biological survey for the EA. Vernal pool tadpole shrimp were not specifically observed during this survey, but have been identified in 9 of the 15 USGS quadrangle maps covering the study area (Figure 4-1).



Source: CNDDB 2001

FIGURE 4-1. REPORTED OCCURRENCES OF VERNAL POOL TADPOLE SHRIMP IN THE STUDY AREA (SHADED QUADRANGLES)

4.3 PROJECT EFFECTS

Vernal pools occur throughout the project area and are likely to be affected in one or more locations. Therefore, the vernal pool tadpole shrimp, or its habitat, may be affected by project-related activities in one or more locations.

Impacts on vernal pool tadpole shrimp from general vegetation management (regardless of the method used), access road maintenance, and transmission line maintenance could include the following:

- Trampling, crushing, or removal of the species;
- Altering topography, causing a vernal pool to drain;
- Changes in soil moisture, nutrient level, and soil structure due to compaction;
- Increases in turbidity from erosion or rutting by heavy equipment; and
- Increases in noxious weed invasion.

4.3.1 NO-ACTION ALTERNATIVE

Vegetation Maintenance. Under the no-action alternative, vehicles accessing the ROW for manual vegetation maintenance could cause damage to vernal pools, if present, adversely affecting vernal pool species by increasing turbidity, destroying plant and animal species, or altering the topography of the vernal pool. Mechanical methods could be similarly destructive to vernal pools.

Access Road Maintenance. The biological survey did not identify vernal pools along access roads in the study area.

Transmission Line Maintenance. Transmission line patrols and repairs could cause damage to vernal pools and vernal pool species by increasing turbidity, destroying plant and animal species within tire tracks, or altering the topography of the vernal pool.

4.3.2 PROPOSED ACTION

Vegetation Maintenance. Under the proposed action, the short-term (1- to 2-year) effects of establishing low-growth species in the ROW, possibly including removal of particular plant species, could affect vernal pools by vehicle traffic as described under the no-action alternative. Over the long term (greater than 2 years), the proposed action would require less active management, therefore, less vehicle traffic and potential for vehicle damage. In addition, the vegetation would be more stable, reducing the sudden effects that could damage vernal pool habitat. However, additional effects from the proposed action could be caused by herbicides affecting vernal pool vegetation (with likely effects to the invertebrate species) through overspray or runoff.

Access Road Maintenance. The biological survey did not identify vernal pools along access roads in the study area.

Transmission Line Maintenance. Transmission line patrols and repairs could cause damage to vernal pools and vernal pool species by increasing turbidity, destroying plant and animal species within tire tracks, or altering the topography of the vernal pool.

4.4 INTERRELATED AND INTERDEPENDENT ACTIONS AND THEIR EFFECTS

No interrelated or interdependent actions that would affect listed or proposed species have been identified.

4.5 CUMULATIVE EFFECTS

Neither the no-action alternative nor the proposed action would combine with any known State, local, or private actions to result in cumulative impacts.

4.6 AVOIDANCE MEASURES

To avoid adverse effects to vernal pool tadpole shrimp, Western would establish buffer zones specific to the type of maintenance activity and season. These buffer zones are listed in Table 4-1 and in the 2005 BO (USFWS 2005).

Table 4-1. Vernal Pool Buffer Zones for ROW Maintenance Methods, Equipment, Techniques/Activities, and Applications

Buffer and Other Considerations		Method	Example Equipment [c]	Technique/Activity [c]	Applications [c]
Dry Season [a]	Wet Season [b]				
Vegetation Maintenance (Transmission Line and Access Road ROWs)					
None	To pool edge	Manual	Chainsaw, clipper, axe	Trimming, removal, disposal	Selective vegetation removal
None	100 ft	Mechanical	Heavy-duty mowers (brush-hog, Hydro-Ax), crawler tractors, chippers	Mowing, removal, disposal	Temporary control of thick stands of vegetation
To pool edge	25 ft	Herbicides	Hand-held applicator	Cut-stump	Control of woody vegetation
100 ft	100 ft	Herbicides	Hand sprayers, power sprayers, herbicide appropriate for technique and application	Spot, localized	Spot treatments where selective elimination of species is desirable. Localized treatment on ROWs with low-to-medium target plant density.
150 ft	150 ft	Herbicides	Vehicle with boom	Broadcast	Treating large/dense areas of ROW vegetation, especially where access by truck is readily available.

Table 4-1. Vernal Pool Buffer Zones for ROW Maintenance Methods, Equipment, Techniques/Activities, and Applications (continued)

Buffer and Other Considerations		Method	Example Equipment [c]	Technique/Activity [c]	Applications [c]
Dry Season [a]	Wet Season [b]				
Access Road Maintenance					
To pool edge. Erect silt fences for work within 25 ft. Do not deposit material within 250 ft upslope of pool.	50 ft. Silt fences or similar means of runoff control will be used if runoff from ground-disturbing activities could reach vernal pool. Construction would apply concepts stated in the U.S. Forest Service Publication *Forest Roads: A Synthesis Of Scientific Information* (June 2000).	Repairing	Bulldozer, caterpillar (tracked vehicle), dump truck, backhoe	Specific to type of repair	Specific to type of repair
		Grading	Bulldozer, caterpillar	Removal and leveling of upper levels of soil profile	Used to construct or repair road surface
		Filling	Dump truck	Delivery of gravel, rock, or soil to fill depressions	Filling of depressions during initial or reconstruction of road
		Cleaning water crossings	Backhoe, dump truck	Removal of debris from culverts and ditches	To maintain optimal efficiency of water diversions to prevent washouts and erosion
		Repair or construction of water bars	Backhoe, dump truck, bulldozer	Grading and shaping of soil to construct/repair a berm to control erosion	Direct water off road surface to prevent washouts or erosion
		Repair or construction of v-shaped ditches	Backhoe	Construction of ditches to allow drainage	Direct water off road surface to prevent washouts or erosion
		Construction or replacement of culverts	Backhoe, truck, trailers	Installation of pipe culvert under across road	Used whenever drainages or streams are of sufficient size

Table 4-1. Vernal Pool Buffer Zones for ROW Maintenance Methods, Equipment, Techniques/Activities, and Applications (concluded)

Buffer and Other Considerations		Method	Example Equipment [c]	Technique/Activity [c]	Applications [c]
Dry Season [a]	Wet Season [b]				
Transmission Line Maintenance					
None	50 ft. No buffer for travel on established roads and access roads.	Patrols (ground)	Pickup truck	Detailed observation of entire transmission system performed on semi-annual basis	Check access to towers/poles, tree clearances, fences, gates, locks, and tower hardware
		Inspection (climbing)	Pickup truck, bucket truck	Detailed observation of system hardware performed on 20 percent of structures each year	Identify deterioration of hardware not detected in aerial or ground inspections
None for non-ground disturb-ing activities. 25 ft for ground disturb-ing activities.	50 ft. Silt fences or similar means of runoff control will be used if runoff from ground-disturbing activities could reach vernal pool.	Repairs and preventative maintenance	Pickup truck, bulldozer, caterpillar, backhoe, bucket truck, hand tools	Based on needs identified during inspections or other reports, replace insulators; tighten, replace, or repair towers/poles or hardware; look for ROW encroachments	Performed wherever damage or deterioration of transmission lines or facilities poses a threat to safety or reliability
250 ft	250 ft	Underground water, power, communication , or ground electrical line	Pickup truck, bulldozer, caterpillar, backhoe, bucket truck, hand tools	Based on needs identified during inspections or other reports, install, replace, or repair underground components related to transmission lines or substations	Performed wherever damage or deterioration of underground components poses a threat to safety or reliability, or where new components are necessary for optimal system operation and safety
250 ft	250 ft	Soil borings from surface to 100 ft deep	Pickup truck, mobile drill rig (rubber-tired truck with outriggers), van for sample management	Direct-push or auger drilling with sample recovery	Subsurface soil recovery for geotechnical or environmental analyses

[a] Dry season defined as that time of year when no standing water is present in vernal pool.
[b] Wet season defined as that time of year when standing water is present in vernal pool.
[c] Note that equipment, activities, and applications are typical, but not all-inclusive. Improvements in technology may result in new types of equipment or broadening of applications.

5.0 VERNAL POOL FAIRY SHRIMP

5.1 BACKGROUND

5.1.1 STATUS, DISTRIBUTION, AND LIFE HISTORY

The vernal pool fairy shrimp is Federally listed as a threatened species (USFWS 1994b). This species is not State-listed. The vernal pool fairy shrimp is found at scattered locations in the Central Valley from Shasta County to Tulare County, along the Coast Ranges from Solano County to San Luis Obispo and Santa Barbara counties, and in southern California in Riverside and San Diego counties. This species is restricted to vernal pools and other seasonal freshwater wetlands (such as vernal pools and swales) in California. Vernal pool fairy shrimp are not known to occur in riverine or marine habitats or in other permanent bodies of water (USFWS 1994b).

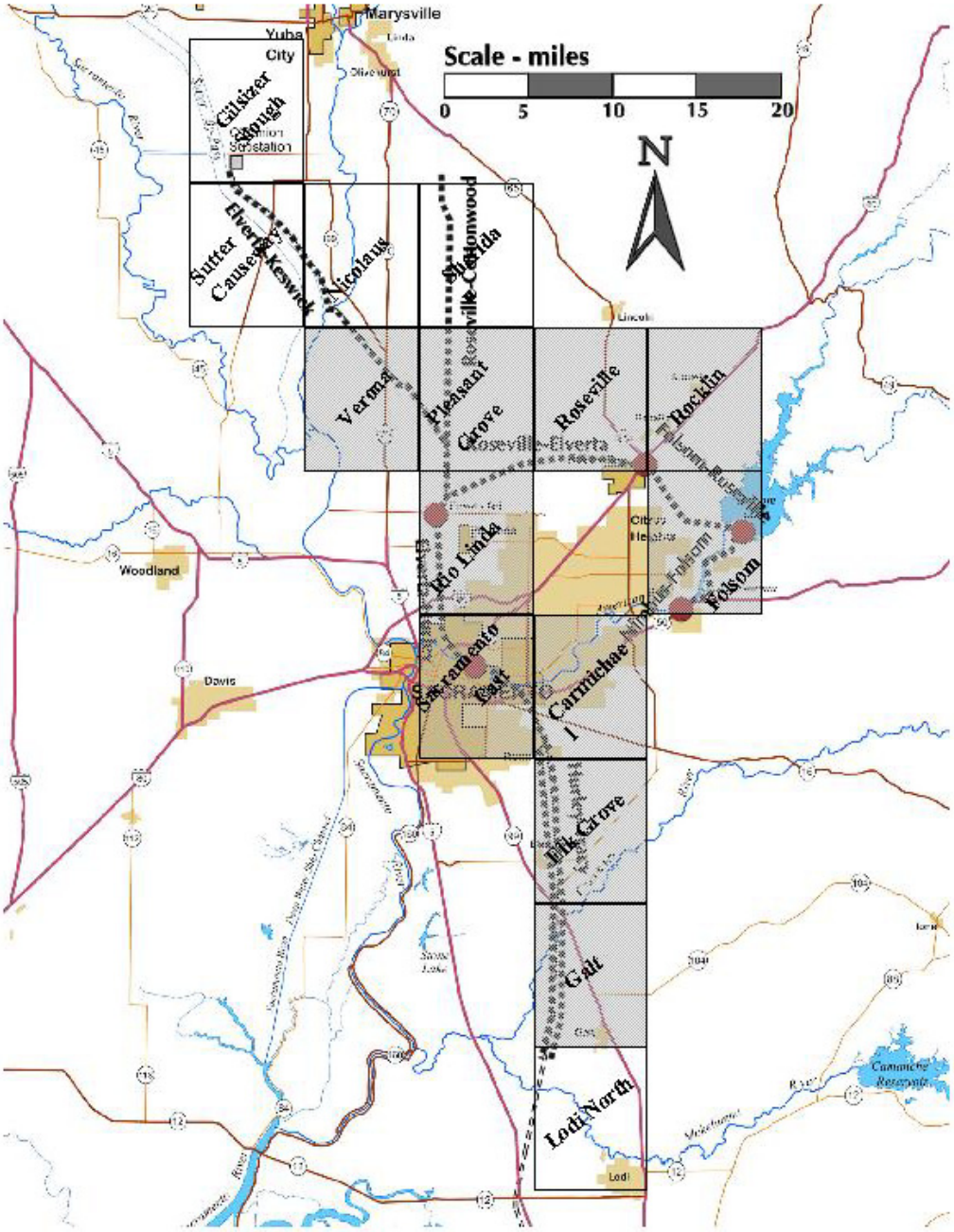
The vernal pool fairy shrimp inhabits vernal pools with clear to tea-colored water. Occupied pools are usually in grass-bottomed or mud-bottomed swales or basalt flow depressions within unplowed grasslands (USFWS 1994b). The species is distributed sporadically within vernal pool complexes. Pools that are occupied by the species typically have low conductivity, TDS, alkalinity, and chloride (Collie and Lathrop 1976). The vernal pool fairy shrimp often occurs with vernal pool fairy shrimp and California linderiella. When found with other shrimp species, however, the vernal pool fairy shrimp is never the most abundant species (Eng et al. 1990). The vernal pool fairy shrimp has been observed in vernal pools from December to early May. This species can mature quickly and, therefore, is able to persist in short-lived shallow pools (USFWS 1994b).

5.1.2 REASON FOR DECLINE

The loss of vernal wetlands is the primary cause for the decline of the vernal pool fairy shrimp. An estimated 90 percent of the suitable habitat for this species has been altered by human activities (such as commercial and residential development, agricultural development, off-road vehicle use, water development projects, and flood control projects). The alteration of vernal pool watersheds caused by modification of surrounding uplands has also resulted in a loss of suitable habitat (USFWS 1994b).

5.2 STATUS IN THE PROJECT AREA

Vernal pools were recorded along the Folsom-Nimbus, Folsom-Roseville, Cottonwood-Roseville, Roseville-Elverta, Hurley-Tracy, and O'Banion-Elverta transmission lines during the biological survey for the EA. Vernal pool fairy shrimp were not observed during this survey, but have been identified in 10 of the 15 USGS quadrangle maps covering the study area (Figure 5-1).



Source: CNDDB 2001

FIGURE 5-1. REPORTED OCCURRENCES OF VERNAL POOL FAIRY SHRIMP IN THE STUDY AREA (SHADED QUADRANGLES)

5.3 PROJECT EFFECTS

Vernal pools occur throughout the project area and are likely to be affected in one or more locations. Therefore, the vernal pool fairy shrimp, or its habitat, may be affected by project-related activities in one or more locations.

Impacts on vernal pool fairy shrimp from general vegetation management (regardless of the method used), access road maintenance, and transmission line maintenance could include the following:

- Trampling, crushing, or removal of the species;
- Increased exposure to direct sun and weather;
- Altering topography, causing a vernal pool to drain;
- Changes in soil moisture, nutrient level, and soil structure due to compaction;
- Increases in turbidity from erosion or rutting by heavy equipment; and
- Increases in noxious weed invasion.

5.3.1 NO-ACTION ALTERNATIVE

Vegetation Maintenance. Under the no-action alternative, vehicles accessing the ROW for manual vegetation maintenance could cause damage to vernal pools, if present, adversely affecting vernal pool species by increasing turbidity, destroying plant and animal species, or altering the topography of the vernal pool. Mechanical methods could be similarly destructive to vernal pools.

Access Road Maintenance. The biological survey did not identify vernal pools along access roads in the study area.

Transmission Line Maintenance. Transmission line patrols and repairs could cause damage to vernal pools and vernal pool species by increasing turbidity, destroying plant and animal species within tire tracks, or altering the topography of the vernal pool.

5.3.2 PROPOSED ACTION

Vegetation Maintenance. Under the proposed action, the short-term (1- to 2-year) effects of establishing low-growth species in the ROW, possibly including removal of particular plant species, could affect vernal pools by vehicle traffic as described under the no-action alternative. Over the long term (greater than 2 years), the proposed action would require less active management, therefore, less vehicle traffic and potential for vehicle damage. In addition, the vegetation would be more stable, reducing the sudden effects that could damage vernal pool habitat. However, additional effects from the proposed action could be caused by herbicides affecting vernal pool vegetation (with likely effects to the invertebrate species) through overspray or runoff.

Access Road Maintenance. The biological survey did not identify vernal pools along access roads in the study area.

Transmission Line Maintenance. Transmission line patrols and repairs could cause damage to vernal pools and vernal pool species by increasing turbidity, destroying plant and animal species within tire tracks, or altering the topography of the vernal pool.

5.4 INTERRELATED AND INTERDEPENDENT ACTIONS AND THEIR EFFECTS

No interrelated or interdependent actions that would affect listed or proposed species have been identified.

5.5 CUMULATIVE EFFECTS

Neither the no-action alternative nor the proposed action would combine with any known State, local, or private actions to result in cumulative impacts.

5.6 AVOIDANCE MEASURES

To avoid adverse effects to vernal pool fairy shrimp, Western would establish buffer zones specific to the type of maintenance activity and season. These buffer zones are listed in Table 4-1.

6.0 WINTER-RUN CHINOOK SALMON

6.1 BACKGROUND

6.1.1 STATUS, DISTRIBUTION, AND LIFE HISTORY

The winter-run Chinook salmon evolutionarily significant unit (ESU) is Federally listed and State-listed as endangered (NMFS 1994). The portion of the Sacramento River from Keswick Dam to Chipps Island, all waters westward from Chipps Island to the Carquinez Strait Bridge, all waters of San Pablo Bay, and all waters of San Francisco Bay north of the San Francisco Oakland Bay Bridge have been designated as critical habitat for winter-run Chinook salmon (NMFS 1993). Critical habitats include the river water, river bottom, and adjacent riparian zone (that is, adjacent terrestrial areas that directly affect a freshwater aquatic ecosystem).

Adult winter-run Chinook salmon leave the ocean and migrate through the Sacramento – San Joaquin River Delta (Delta) into the Sacramento River from November through July. Salmon migrate upstream past the Red Bluff Diversion Dam (RBDD) on the Sacramento River from mid-December through July, and most of the spawning population has passed RBDD by late June.

Winter-run Chinook salmon spawn from mid-April through August, and incubation continues through October. The primary spawning grounds in the Sacramento River are above RBDD. Some fish may spawn below RBDD, but deleterious temperatures below RBDD kill the eggs during most summers (USACE 2001).

Juvenile winter-run Chinook salmon live in the Sacramento River from July through March. Juveniles migrate downstream past RBDD from July through March (Hallock and Fisher 1985, USACE 2001). Juveniles have been observed in the Delta from October through December, especially during high Sacramento River discharge caused by fall and early winter storms.

Juvenile Chinook salmon move out of upstream spawning areas into downstream habitats in response to many factors, including inherited behavior, habitat availability, flow, competition for space and food, and water temperature. The numbers of juveniles that move and the timing of movement are highly variable. Storm events and the resulting high flows cause movement of substantial numbers of juvenile Chinook salmon to downstream habitats. During winter and spring flows, juvenile salmon may disperse to accessible flood plain habitat (such as Sutter and Yolo bypasses) where they continue to live before migrating seaward (California Department of Water Resources 1999). In general, juvenile salmon abundance in the Delta increases as flow increases (USFWS 1993a).

Winter-run salmon smolts may migrate through the Delta and the San Francisco Bay to the ocean from December through as late as May (Stevens 1989). Adult winter-run Chinook salmon spend 1 – 3 years in the ocean. Approximately 67 percent of the adult salmon escapement that leaves the ocean to spawn in the Sacramento River are 3-year-olds, 25 percent are 2-year-olds, and 8 percent are 4-year-olds (Hallock and Fisher 1985). The 2- year-olds in the escapement (primarily immature males) are not believed to contribute to spawning success and production of the year class (USACE 2001).

Shaded riverine aquatic (SRA) cover is an important component of winter-run Chinook salmon habitat. SRA cover is the near-shore aquatic zone occurring at the interface between the river and adjacent riparian zone. The principal attributes of SRA cover include the adjacent bank composed of natural, eroding substrates supporting riparian vegetation that overhangs and/or protrudes into the water; woody debris in the water, such as leaves, logs, branches, and roots; and variable water depths, velocities, and currents (USFWS 1993a). SRA cover is particularly important to juvenile salmonids because it moderates stream temperatures during the growing season and provides high-value resting and feeding areas, protection from predators, and shelter from high flows.

6.1.2 REASON FOR DECLINE

Major factors believed to have contributed to the decline of winter-run Chinook salmon include blockage or delays in adult passage to suitable spawning and rearing areas and lethal water temperatures during egg incubation and early rearing. Other factors that may impede recovery to former levels of abundance and continue to adversely affect winter-run salmon include entrainment loss to diversions, increased predation, the presence of toxic mine waste, diversion from the primary juvenile migration path through the Delta, and ocean fishing (USACE 2001).

6.2 STATUS IN THE PROJECT AREA

Winter-run Chinook salmon do not spawn in the Lower American River, but small numbers of juvenile Chinook salmon, in the winter-run size range, have been caught in the lower reaches (DFG 1993). This suggests that some winter-run Chinook salmon may live in the Lower American River during their downstream migration in the lower Sacramento River. Based on the general timing of downstream migration in the lower Sacramento River and the Delta, winter-run Chinook salmon may occur in the Lower American River from October through May, with the greatest potential for occurrence from December through April. The Hurley-Tracy line crosses the American River approximately one-half mile west of the Watt Avenue Bridge in Sacramento, California.

6.3 PROJECT EFFECTS

Erosion impacts on soil would affect water-quality. Turbidity, sedimentation, loss of large organic debris, loss of shading (and associated temperature increases), and exposure to hazardous substances would affect fish.

Vegetation control could result in a loss of tree-shading (at the southern point where the Hurley-Tracy transmission line crosses the American River) and increased turbidity from runoff in areas where maintenance vehicles cause erosion. If large trees were cut down and removed within riparian zones, stream shading would be lost immediately, and the large woody debris that would later fall into streams and provide shelter for fish (an important component of aquatic systems) would be removed. Reduced shading could increase stream temperatures. However, because ROWs are linear, they tend to have little impact on stream temperatures. In the study area, less than 150 ft of any stream would be typically affected. Loss of shading would become important only if it were to occur where other activities are also causing losses in riparian shading at a watershed level. Increased turbidity and sedimentation could reduce

fish feeding success. In severe cases, sedimentation could keep fry (early-stage fish) from emerging. Neither the effects of shade loss nor increased turbidity would be regarded as significant given the size and volume of the American River at the Hurley-Tracy transmission line crossing.

6.3.1 NO-ACTION ALTERNATIVE

Vegetation Maintenance. Under the no-action alternative, negative effects to fish could result from elimination or reduction of shade trees on the southern point where the Hurley-Tracy transmission line crosses the American River or from increased turbidity associated with runoff if maintenance vehicles in the area cause increased erosion. Neither of these possibilities would be regarded as significant given the size and volume of the American River at the Hurley-Tracy transmission line crossing. This would not be an adverse effect to the winter-run Chinook salmon.

Access Road Maintenance. No access roads cross perennial waterways in the study area.

Transmission Line Maintenance. Routine transmission line patrols would not have effects on waterways. Ground-disturbing repairs near waterways could lead to increased turbidity, but such activities would be localized (for example, at the base of a single tower) and of short duration.

6.3.2 PROPOSED ACTION

Vegetation Maintenance. Under the proposed action, negative effects would be the same as those described for the no-action alternative, with the addition of chemical runoff if herbicides were used. Western selects herbicides for use partially based on their low toxicity and bioaccumulation potential. Dilution would play a major role in diminishing any impact to these fish from herbicide runoff from the ROW. As part of the best management practices incorporated into the proposed action, Western would ensure that all herbicides are compatible with the environment in which they are used, including any restrictions on use near water bodies.

Access Road Maintenance. No access roads cross perennial waterways in the study area.

Transmission Line Maintenance. Routine transmission line patrols would not have effects on waterways. Ground-disturbing repairs near waterways could lead to increased turbidity, but such activities would be localized (for example, at the base of a single tower) and of short duration.

6.4 INTERRELATED AND INTERDEPENDENT ACTIONS AND THEIR EFFECTS

No interrelated or interdependent actions that would affect listed or proposed species have been identified.

6.5 CUMULATIVE EFFECTS

Neither the no-action alternative nor the proposed action would combine with any known State, local, or private actions to result in cumulative impacts.

6.6 AVOIDANCE MEASURES

To avoid adverse effects to winter-run Chinook salmon, Western would

- Trim trees providing shade to riverine areas only to the extent necessary; and
- Define a 100-ft buffer on each side of all perennial watercourses. In this buffer, no chemicals would be mixed, no open petroleum products would be allowed and only hand clearing of vegetation would be permitted (no foliar application of herbicides). This buffer would not apply to cut-stump treatments using herbicides approved for aquatic use by the U.S. Environmental Protection Agency (EPA), subject to any additional restrictions imposed by the State of California.

7.0 SPRING-RUN CHINOOK SALMON

7.1 BACKGROUND

7.1.1 STATUS, DISTRIBUTION, AND LIFE HISTORY

The spring-run Chinook salmon ESU is Federally listed and State-listed as threatened (NMFS 1994). The ESU includes all naturally spawned populations of spring-run Chinook salmon in the Sacramento River and its tributaries. The National Marine Fisheries Service (NMFS) has designated the Sacramento River and the Delta, as well as Honker, Grizzly, Suisun, and San Francisco Bays, as critical habitat for spring-run Chinook salmon. Critical habitats include the river water, river bottom, and adjacent riparian zone.

Most of the spring-run Chinook salmon habitat has been eliminated by the development of dams that preclude adults from spawning at the headwaters. Adult distribution is limited to the Sacramento River below Keswick Dam and some tributaries. Although spawning habitat is available for the spring-run fish, they also depend on spatial isolation to prevent competition and hybridization with fall-run Chinook salmon (DFG 1998).

The Sacramento River spring-run Chinook salmon population has been declining for many decades. Demographic and genetic risks resulting from the current small size of the population are considered high by the California Department of Fish and Game (DFG) (1998). Chinook salmon require cold freshwater streams with suitable gravel for reproduction. Females deposit their eggs in nests in gravel-bottom areas of relatively swift water. For maximum survival of incubating eggs and larvae, water temperatures must be between 39 degrees Fahrenheit (ºF) and 57ºF. After emerging, Chinook salmon fry tend to seek shallow, near-shore habitat with low water velocities, moving to progressively deeper, faster water as they grow. Spring-run juveniles frequently reside in freshwater habitat for 12 – 16 months, but many young migrate to the ocean during spring within 5 – 8 months after hatching. The San Francisco Bay, with its surrounding waters and inlets, and the Delta are important rearing areas for these migrants (DFG 1998).

The time frames of adult winter and spring runs overlap and races are not easily distinguished during the runs (Healey 1991). Spring-run adults enter the San Francisco Bay from November through June. Unlike fall-run Chinook that spawn soon after arriving to the spawning grounds, spring-run Chinook delay spawning until late August or September in the upper reaches of the main stem of the Sacramento River and its main tributaries (Healey 1991). Bermann and Quinn (1991) suggest that delays in spawning migration may be a result of habitat selection (coldwater areas) rather than limitations in locating spawning areas because females may increase reproduction success by minimizing energy expenditure before spawning. Rearing juvenile spring-run salmon requires adequate space, cover, and food. Suitable habitat includes areas with in-stream and overhead cover such as undercut banks, downed trees, and large overhanging tree branches. The organic materials that form fish cover also help provide sources of food.

Flow conditions in natal streams and the Sacramento River influence juvenile entry into the Delta and ocean. Slow flow conditions impede the juveniles' travel. Juveniles generally migrate downstream from late November to June.

Ocean harvest rates appear to be moderate. Ocean fishery management focuses on the fall run, with no defined management objectives for spring-run salmon.

7.1.2 REASON FOR DECLINE

Factors related to the decline of spring-run Chinook salmon include loss of habitat in river reaches blocked by dams, degradation of habitat conditions (such as increases in water temperature), entrainment in water diversions, and over-harvest. The human-caused factor that has had the greatest effect on the abundance of spring-run Chinook salmon runs is loss of habitat, primarily in the rivers upstream from the Delta. Major dams have blocked upstream access to most Chinook salmon habitat in Central Valley rivers and streams, and smaller dams contribute to migration delay.

On most Central Valley streams, spring-run Chinook salmon are restricted to habitats with marginal water temperature conditions and limited deep holding areas. Water diversions and reservoir operations affect stream flow, which influences the quantity, quality, and distribution of Chinook salmon spawning and rearing habitat. Water diversions also reduce the survival of emigrating juvenile salmonids through direct entrainment losses in unscreened or inadequately screened diversions. Predation on emigrating salmonids at diversion dams may also be an important survival factor (U.S. Bureau of Reclamation 1983).

Hybridization may be a more important factor for spring-run than for winter-run salmon because it has been reported that spring-run salmon were likely to have interbred with fall-run fish in the main stem Sacramento and Feather Rivers. However, the extent of hybridization is unknown (Reynolds et al. 1993).

7.2 STATUS IN THE PROJECT AREA

There is no evidence that spring-run Chinook salmon use the Lower American River for spawning, but they may temporarily use the Lower American River during out-migration as do winter-run Chinook salmon. The spring-run adults and juveniles use the lower Sacramento River for migration and juveniles also use it for rearing prior to migration to the ocean. Juvenile spring-run Chinook salmon also use the Sacramento and Yolo bypasses for rearing and migration (California Department of Water Resources 1999). The Hurley-Tracy transmission line crosses the American River approximately one-half mile west of the Watt Avenue Bridge.

7.3 PROJECT EFFECTS

Erosion impacts on soil would affect water quality. Turbidity, sedimentation, loss of large organic debris, loss of shading (and associated temperature increases), and exposure to hazardous substances would affect fish.

Vegetation control could result in a loss of tree-shading (at the southern point where the Hurley-Tracy transmission line crosses the American River) and increased turbidity from runoff in areas where maintenance vehicles cause erosion. If large trees were cut down and removed within riparian zones, stream shading would be lost immediately, and the large woody debris

that would later fall into streams and provide shelter for fish (an important component of aquatic systems) would be removed. Reduced shading could increase stream temperatures. However, because ROWs are linear, they tend to have little impact on stream temperatures. In the study area, less than 150 ft of any stream would be typically affected. Loss of shading would become important only if it were to occur where other activities are also causing losses in riparian shading at a watershed level. Increased turbidity and sedimentation could reduce fish feeding success. In severe cases, sedimentation could keep fry (early-stage fish) from emerging. Neither the effects of shade loss nor increased turbidity would be regarded as significant given the size and volume of the American River at the Hurley-Tracy transmission line crossing.

7.3.1 NO-ACTION ALTERNATIVE

Vegetation Maintenance. Under the no-action alternative, negative effects to fish could result from elimination or reduction of shade trees on the southern point where the Hurley-Tracy transmission line crosses the American River or from increased turbidity associated with runoff if maintenance vehicles in the area cause increased erosion. Neither of these possibilities would be regarded as significant given the size and volume of the American River at the Hurley-Tracy transmission line crossing. This would not be an adverse effect to the spring-run Chinook salmon.

Access Road Maintenance. No access roads cross perennial waterways in the study area.

Transmission Line Maintenance. Routine transmission line patrols would not have effects on waterways. Ground-disturbing repairs near waterways could lead to increased turbidity, but such activities would be localized (such as at the base of a single tower) and of short duration.

7.3.2 PROPOSED ACTION

Vegetation Maintenance. Under the proposed action, negative effects would be the same as those described for the no-action alternative, with the addition of chemical runoff if herbicides are used. Western selects herbicides for use partially based on their low toxicity and bioaccumulation potential. Dilution would play a major role in diminishing any impact to these fish from herbicide runoff from the ROW. As part of the best management practices incorporated into the proposed action, Western would ensure that all herbicides are compatible with the environment in which they are used, including any restrictions on use near water bodies.

Access Road Maintenance. No access roads cross perennial waterways in the study area.

Transmission Line Maintenance. Routine transmission line patrols would not have effects on waterways. Ground-disturbing repairs near waterways could lead to increased turbidity, but such activities would be localized (such as at the base of a single tower) and of short duration.

7.4 INTERRELATED AND INTERDEPENDENT ACTIONS AND THEIR EFFECTS

No interrelated or interdependent actions that would affect listed or proposed species have been identified.

7.5 CUMULATIVE EFFECTS

Neither the no-action alternative nor the proposed action would combine with any known State, local, or private actions to result in cumulative impacts.

7.6 AVOIDANCE MEASURES

To avoid adverse effects to spring-run Chinook salmon, Western would

- Trim trees providing shade to riverine areas only to the extent necessary; and
- Define a 100-ft buffer on each side of all perennial watercourses. In this buffer, no chemicals would be mixed, no open petroleum products would be allowed and only hand clearing of vegetation would be permitted (no foliar application of herbicides). This buffer would not apply to cut-stump treatments using herbicides approved for aquatic use by the EPA, subject to any additional restrictions imposed by the State of California.

8.0 CENTRAL VALLEY STEELHEAD

8.1 BACKGROUND

8.1.1 STATUS, DISTRIBUTION, AND LIFE HISTORY

Central Valley steelhead was Federally listed as a threatened species on March 19, 1998 (USFWS 1998a). The ESU includes all naturally spawned populations of steelhead (and their progeny) in the Sacramento and San Joaquin rivers and their tributaries. Steelhead from San Francisco and San Pablo bays and their tributaries are excluded. On February 16, 2000, NMFS designated the Central Valley steelhead's critical habitat to include all river reaches accessible to listed steelhead in the Sacramento and San Joaquin Rivers and their tributaries in California (NMFS 2000). The critical habitat also includes adjacent riparian zones, as well as river reaches and estuarine areas of the Delta; all waters from Chipps Island westward to Carquinez Bridge, (including Honker, Grizzly, Suisun bays and Carquinez Strait); all waters of San Pablo Bay westward of the Carquinez Bridge; and all waters of San Francisco Bay (north of the San Francisco Oakland Bay Bridge) from San Pablo Bay to Golden Gate Bridge. Excluded are areas of the San Joaquin River upstream of the Merced River confluence, tribal lands, and areas above specific dams or above longstanding, naturally impassable barriers (such as natural waterfalls in existence for at least several hundred years). Adult steelhead return to spawn in the Sacramento River and its tributaries after 1 – 3 years of ocean residence. Upstream migration in the Lower American River ranges from November to April and peaks in January (Jones & Stokes 2000). Spawning usually takes place from late December to March, but can range from November through April (Jones & Stokes 2000). Steelhead fry emerge from riverbed gravel nests 2 – 8 weeks after hatching, usually during April and May (Barnhart and Parsons 1986, McEwan and Nelson 1991, Reynolds et al. 1993).

Juveniles live in the rivers through summer and migrate downstream to the ocean during November to May. Fry generally remain in their natal river or stream (Schaffter 1980). Steelhead have been collected during nearly every month at the State Water Project (SWP) and the Central Valley Project (CVP) Delta pumping facilities. Peak salvage at the SWP and CVP facilities occurs primarily during March and April. Migration timing is similar to the timing of the seaward migration of winter-run Chinook salmon, although water temperature and river flow affect the timing of juvenile steelhead migration through the Delta.

Adult steelhead enter the Lower American River from November through April, with peak abundance typically occurring in January. Spawning occurs primarily from January through March. Steelhead fry emerge from riverbed gravel nests from March through May. Unlike Chinook salmon, steelhead juveniles are present year-round in the Lower American River, living in the river for 1 – 2 years before emigrating from the river as smolts, typically from March through June.

8.1.2 REASON FOR DECLINE

As with winter-run Chinook salmon, the primary human-caused factors influencing steelhead abundance are activities upstream from the Delta (for example, dam closure, elevated water

temperature, and diversions). Delta diversions have contributed to the increased mortality of juvenile steelhead during their migration through the Delta.

Ongoing factors affecting the mortality of steelhead include deleterious water temperatures in spawning and rearing habitat, delay of juvenile migration, increased predation during juvenile migration, and entrainment of juveniles in diversions. All of these problems have resulted from the maintenance and operation of facilities for water diversions, water storage, agricultural drainage, and flood control, both on the Sacramento River and its tributaries and in the Delta.

In summary, habitat degradation has reduced the population of steelhead. Major factors are blockage of adult passage to suitable spawning and rearing areas and lethal water temperatures during egg incubation and early rearing. Other factors that may impede recovery to former levels of abundance and continue to adversely affect steelhead include entrainment loss to diversions, in-river sport fishing, increased predation, the presence of toxic mine waste, and diversion of the primary juvenile migration path through the Delta.

8.2 STATUS IN THE PROJECT AREA

The project area is within the designated critical habitat area for Central Valley steelhead. Adult and juvenile steelhead use the Sacramento River as a migration path primarily during winter and spring. Because of their need for suitable water temperatures throughout the year, most steelhead live upstream from the project area. The majority of steelhead in the American River are hatchery produced, and many of the steelhead produced at Coleman National and Feather River Fish Hatcheries stray and return to the American River. The Hurley-Tracy transmission line crosses the American River; the O'Banion-Elverta transmission line crosses the Feather River.

8.3 PROJECT EFFECTS

Erosion impacts on soil would affect water-quality. Turbidity, sedimentation, loss of large organic debris, loss of shading (and associated temperature increases), and exposure to hazardous substances would affect fish.

Vegetation control could result in a loss of tree-shading (at the southern point where the Hurley-Tracy transmission line crosses the American River) and increased turbidity from runoff in areas where maintenance vehicles cause erosion. If large trees were cut down and removed within riparian zones, stream shading would be lost immediately, and the large woody debris that would later fall into streams and provide shelter for fish (an important component of aquatic systems) would be removed. Reduced shading could increase stream temperatures. However, because ROWs are linear, they tend to have little impact on stream temperatures. In the study area, less than 150 ft of any stream would be typically affected. Loss of shading would become important only if it were to occur where other activities are also causing losses in riparian shading at a watershed level. Increased turbidity and sedimentation could reduce fish feeding success. In severe cases, sedimentation could keep fry (early-stage fish) from emerging. Neither the effects of shade loss nor increased turbidity would be regarded as significant given the size and volume of the American River at the Hurley-Tracy transmission line crossing.

8.3.1 NO-ACTION ALTERNATIVE

Vegetation Maintenance. Under the no-action alternative, negative effects to fish could result from elimination or reduction of shade trees on the southern point where the Hurley-Tracy transmission line crosses the American River and where the O'Banion-Elverta transmission line crosses the Feather River or from increased turbidity associated with runoff if maintenance vehicles in the area cause increased erosion. None of these possibilities would be regarded as significant given the size and volume of the American River at the Hurley-Tracy transmission line crossing or the Feather River at the O'Banion-Elverta transmission line crossing. This would not be an adverse effect to the Central Valley steelhead.

Access Road Maintenance. No access roads cross perennial waterways in the study area.

Transmission Line Maintenance. Routine transmission line patrols would not have effects on waterways. Ground-disturbing repairs near waterways could lead to increased turbidity, but such activities would be localized (such as at the base of a single tower) and of short duration.

8.3.2 PROPOSED ACTION

Vegetation Maintenance. Under the proposed action, negative effects would be the same as those described for the no-action alternative, with the addition of chemical runoff if herbicides are used. Western selects herbicides for use partially based on their low toxicity and bioaccumulation potential. Dilution would play a major role in diminishing any impact to these fish from herbicide runoff from the ROW. As part of the best management practices incorporated into the proposed action, Western would ensure that all herbicides are compatible with the environment in which they are used, including any restrictions on use near water bodies.

Access Road Maintenance. No access roads cross perennial waterways in the study area.

Transmission Line Maintenance. Routine transmission line patrols would not have effects on waterways. Ground-disturbing repairs near waterways could lead to increased turbidity, but such activities would be localized (such as at the base of a single tower) and of short duration.

8.4 INTERRELATED AND INTERDEPENDENT ACTIONS AND THEIR EFFECTS

No interrelated or interdependent actions that would affect listed or proposed species have been identified.

8.5 CUMULATIVE EFFECTS

Neither the no-action alternative nor the proposed action would combine with any known State, local, or private actions to result in cumulative impacts.

8.6 AVOIDANCE MEASURES

To avoid adverse effects to Central Valley steelhead, Western would

- Trim trees providing shade to riverine areas only to the extent necessary; and
- Define a 100-ft buffer on each side of all perennial watercourses. In this buffer, no chemicals would be mixed, no open petroleum products would be allowed and only hand clearing of vegetation would be permitted (no foliar application of herbicides). This buffer would not apply to cut-stump treatments using herbicides approved for aquatic use by the EPA, subject to any additional restrictions imposed by the State of California.

9.0 CALIFORNIA TIGER SALAMANDER

9.1 BACKGROUND

9.1.1 STATUS, DISTRIBUTION, AND LIFE HISTORY

The California tiger salamander (*Ambystoma californiense*) has been listed since August 2004 by the USFWS as threatened under the Endangered Species Act (USFWS 2004). An amphibian in the family Ambystomatidae, it is a large, stocky, terrestrial salamander with a broad, rounded snout. Adult males are about 8 inches long; females are a little less than 7 inches long.

Coloration consists of white or pale yellow spots or bars on a black background on the back and sides. The belly varies from almost uniform white or pale yellow to a variegated pattern of white or pale yellow and black. The salamander's small eyes protrude from their heads. They have black irises.

Males can be distinguished from females, especially during the breeding season, by their swollen cloacae, a common chamber into which the intestinal, urinary, and reproductive canals discharge. They also have more developed tail fins and, as mentioned above, larger overall size.

The species is restricted to grasslands and low (under 1,500 ft) foothill regions where lowland aquatic sites are available for breeding. They prefer natural ephemeral pools or ponds that mimic them (stock ponds that are allowed to go dry).

Larvae require significantly more time to transform into juvenile adults than other amphibians such as the western spadefoot toad and Pacific tree frog. These requirements restrict California tiger salamanders to large vernal pools, vernal playas and large sag ponds. Compared to the western toad or western spadefoot toad, California tiger salamanders are poor burrowers. They require refuges provided by ground squirrels and other burrowing mammals in which to enter a dormant state called estivation during the dry months.

The range of California tiger salamander is restricted to California. The species persists in disjunct remnant vernal pool complexes in Sonoma and Santa Barbara Counties, in vernal pool complexes and isolated ponds scattered mainly along narrow strips of rangeland on each side of the Central Valley from southern Colusa County south to northern Kern County, and in sag ponds and human-maintained stock ponds in the coast ranges from Suisun Bay south to the Temblor Range.

The California tiger salamander has been eliminated from an estimated 55 to 58 percent of its historic breeding sites and has lost an estimated 75 percent of its habitat. Although there are approximately 150 known local populations of California tiger salamanders, the species is currently protected only at Jepson Prairie Natural Preserve and Hickson Preserve.

9.1.2 REASON FOR DECLINE

The primary cause of the decline of California tiger salamander populations is the loss and fragmentation of habitat from human activities and the encroachment of nonnative predators.

Federal, State, and local laws have not prevented past and ongoing losses of habitat. All of the estimated seven genetic populations of this species have been significantly reduced because of urban and agricultural development, land conversion, and other human-caused factors.

A strong negative association between bullfrogs and California tiger salamanders has been documented. Although bullfrogs are unable to establish permanent breeding populations in vernal pools, dispersing immature frogs from permanent water bodies within two miles take up residence and prey on adult or larval salamanders in these areas during the rainy season. Louisiana swamp crayfish, mosquito fish, green sunfish and other introduced fishes also prey on adult or larval salamanders.

A deformity-causing infection, possibly caused by a parasite in the presence of other factors, has affected pond-breeding amphibians at known California tiger salamander breeding sites. This same infection has become widespread among amphibian populations in Minnesota and poses the threat of becoming widespread here.

Reduction of ground squirrel populations to low levels through widespread rodent control programs may reduce availability of burrows and adversely affect the California tiger salamander. Poison typically used on ground squirrels is likely to have a disproportionately adverse effect on California tiger salamanders, which are smaller than the target species and have permeable skins. Use of pesticides, such as methoprene, in mosquito abatement may have an indirect adverse effect on the California tiger salamander by reducing the availability of prey.

Various nonnative subspecies of the tiger salamander within the *Ambystoma tigrinum* complex have been imported into California for use as fish bait. The introduced salamanders may out-compete the California tiger salamanders, or interbreed with them to create hybrids that may be less adapted to the California climate or are not reproductively viable past the first or second generations.

Automobiles and off-road vehicles kill a significant number of migrating California tiger salamanders, and contaminated runoff from roads, highways and agriculture may adversely affect them.

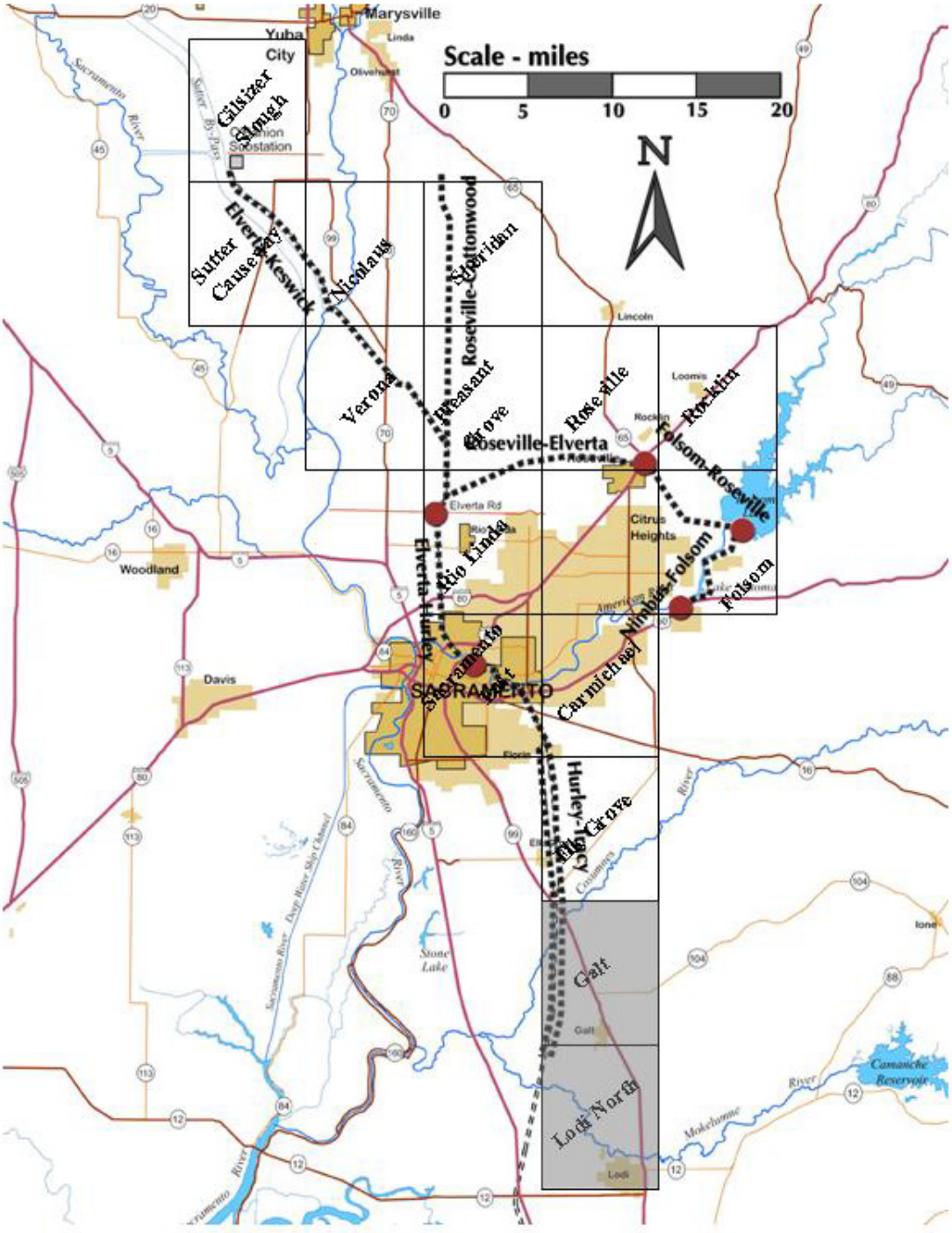
9.2 STATUS IN THE PROJECT AREA

Sightings of the California tiger salamander have not been recorded in the study area, though it has been documented in the Lodi North and Galt quadrangles (Figure 9-1). The USFWS has proposed critical habitat in areas of the Central Valley, including parts of Sacramento County. Western's transmission lines or ROWs do not cross any of these areas. However, there is suitable habitat in the ROWs.

9.3 PROJECT EFFECTS

Vernal pools, ponds, and grasslands occur throughout the project area and are likely to be affected in one or more locations. Therefore, the California tiger salamander, or its habitat, may be affected by project-related activities in one or more locations.

The effects of herbicides and daughter products on amphibians is not well-understood, but there is some evidence that herbicides harm amphibians. If California tiger salamanders were



Source: CNDDB 2001

FIGURE 9-1. REPORTED OCCURRENCES OF CALIFORNIA TIGER SALAMANDER IN THE STUDY AREA (SHADED QUADRANGLES)

exposed to this runoff, either as it crossed land or later in aquatic systems, the chemicals could adversely affect the salamanders.

Impacts the California tiger salamander from general vegetation management (regardless of the method used), access road maintenance, and transmission line maintenance could include the following:

- Trampling, crushing, or removal of the species;
- Increased exposure to direct sun and weather;
- Altering topography, causing a vernal pool to drain;
- Changes in soil moisture, nutrient level, and soil structure due to compaction;
- Increases in turbidity from erosion or rutting by heavy equipment; and
- Increases in noxious weed invasion.

9.3.1 NO-ACTION ALTERNATIVE

Vegetation Maintenance. Under the no-action alternative, vehicles accessing the ROW for manual vegetation maintenance could cause damage to vernal pools or ponds, if present, adversely affecting the species by increasing turbidity, destroying plant and animal species, or altering topography. Mechanical methods could be similarly destructive to vernal pools and ponds.

Access Road Maintenance. The biological survey did not identify suitable California tiger salamander habitat along access roads in the study area.

Transmission Line Maintenance. Transmission line patrols and repairs could cause damage to vernal pools and ponds by increasing turbidity, destroying plant and animal species within tire tracks, or altering topography.

9.3.2 PROPOSED ACTION

Vegetation Maintenance. Under the proposed action, the short-term (1- to 2-year) effects of establishing low-growth species in the ROW, possibly including removal of particular plant species, could affect vernal pools and ponds by vehicle traffic as described under the no-action alternative. Over the long term (greater than 2 years), the proposed action would require less active management, therefore, less vehicle traffic and potential for vehicle damage. In addition, the vegetation would be more stable, reducing the sudden effects that could damage habitat. However, additional effects from the proposed action could be caused by herbicides affecting vernal pool or pond vegetation (with likely effects to amphibians) through overspray or runoff.

Access Road Maintenance. The biological survey did not identify suitable California tiger salamander habitat along access roads in the study area.

Transmission Line Maintenance. Transmission line patrols and repairs could cause damage to vernal pools and ponds by increasing turbidity, destroying plant and animal species within tire tracks, or altering topography.

9.4 INTERRELATED AND INTERDEPENDENT ACTIONS AND THEIR EFFECTS

No interrelated or interdependent actions that would affect listed or proposed species have been identified.

9.5 CUMULATIVE EFFECTS

Neither the no-action alternative nor the proposed action would combine with any known State, local, or private actions to result in cumulative impacts.

9.6 AVOIDANCE MEASURES

To avoid adverse effects to the California tiger salamander, Western would

- Use the results of the biological survey to determine the location of vernal pools and ponds and avoid them during routine maintenance activities.
- Identify areas where vernal pools and ponds are concentrated and establish avoidance buffers or prohibit routine maintenance activity in those areas during wet seasons.
- Locate wire pulling, wire splicing, and maintenance materials outside of vernal pool and pond habitats or on existing roads.

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10.0 GIANT GARTER SNAKE

10.1 BACKGROUND

10.1.1 STATUS, DISTRIBUTION, AND LIFE HISTORY

The giant garter snake is a Federally listed and State-listed threatened species (USFWS 1993d). Historically, this species was found throughout the Central Valley from Butte County south to Kern County. The giant garter snake had been extirpated from the southern one-third of its range by the 1940s to 1950s as a result of habitat loss to wetland reclamation and agricultural development (Hansen and Brode 1980). As recently as the 1970s, the species' range extended from the vicinity of Chico in Butte County (Rossman and Stewart 1987) south to near Burrell in Fresno County (Hansen and Brode 1980). Presently, giant garter snake populations are limited to ponds, sloughs, marshes, and rice fields in Sacramento, Sutter, Butte, Colusa, and Glenn Counties. Additional remnant populations of giant garter snakes exist along the western border of the Yolo Bypass in Yolo County, along the eastern fringes of the Delta from the Laguna Creek-Elk Grove region of Sacramento County to Stockton in San Joaquin County, and south to Fresno County (Hansen 1988; USFWS 1993d).

USFWS recognizes 13 populations of giant garter snakes. The locations of these populations coincide with historical riverine flood basins and tributary streams throughout the Central Valley. Some of these populations may not be viable because they are small and occur in areas where the quality and extent of habitat are limited. Populations in the Butte, Colusa, Sutter, and American basins occupy the agricultural water delivery and drainage ditches associated with rice production. Populations in other areas occur in small, isolated patches of habitat. The largest extant population of giant garter snakes inhabits the agricultural channels and ditches in the American Basin at the confluence of the American and Sacramento rivers (USFWS 1993d). Giant garter snake populations are believed to be declining (DFG 1994).

The giant garter snake is endemic to Central Valley wetlands. The species inhabits marshes, sloughs, ponds, small lakes, and low-gradient waterways such as small streams, irrigation and drainage canals, and rice fields. Giant garter snakes feed on small fish, tadpoles, and frogs (Fitch 1940, Hansen 1988). The giant garter snake requires the following habitat components:

- Adequate water during the active season (early spring through mid-fall) to provide food and cover,
- Emergent wetland vegetation such as cattails (*Typha* spp.) and bulrushes (*Scirpus* spp.) to provide escape cover and foraging habitat,
- Grassy banks for basking, and
- Higher elevation uplands for cover and refuge from winter floods during the dormant season (November to mid-March) (Hansen and Brode 1980, Hansen 1988, 58 FR 54053-54065 October 20, 1993).

Giant garter snakes are absent from large rivers and other water bodies that support introduced populations of large, predatory fish; wetlands with sand, gravel, and rock substrates; and natural and artificial waterways where weeds are controlled routinely, either

mechanically or chemically, and where bank soils are compacted regularly (Hansen and Brode 1980; Rossman and Stewart 1987; Hansen 1988). Giant garter snakes are usually also absent from riparian woodlands because the woodlands have excessive shade and lack basking areas and prey populations (Hansen and Brode 1980).

The wetland habitats where giant garter snakes are known to occur contain permanent or seasonal water, mud bottoms, and vegetated dirt banks (Fitch 1940, Hansen and Brode 1980). In portions of the species' range where rice is grown, this species has adapted well to the vegetated artificial waterways used to flood rice fields (Hansen and Brode 1980). Prior to wetland reclamation, occupied habitats probably consisted of freshwater marshes and low-gradient streams.

10.1.2 REASON FOR DECLINE

Giant garter snake populations have declined from habitat fragmentation and loss to agricultural uses, urban development, and flood control projects (Hansen and Brode 1980). Remaining valley wetland habitats continue to be degraded by toxic chemicals associated with agricultural, industrial, and urban runoff.

Predation may also be an important factor in the giant garter snake's decline. Predatory fish that have been introduced throughout the Central Valley compete with and prey on giant garter snakes. The introduction of non-native predatory fish species has reduced the suitability of nearly all permanent and semipermanent waters in the Central Valley (USFWS 1993d). The bullfrog, which has been introduced throughout the Central Valley, may also be an important predator and is known to prey on giant garter snakes (Treanor 1983).

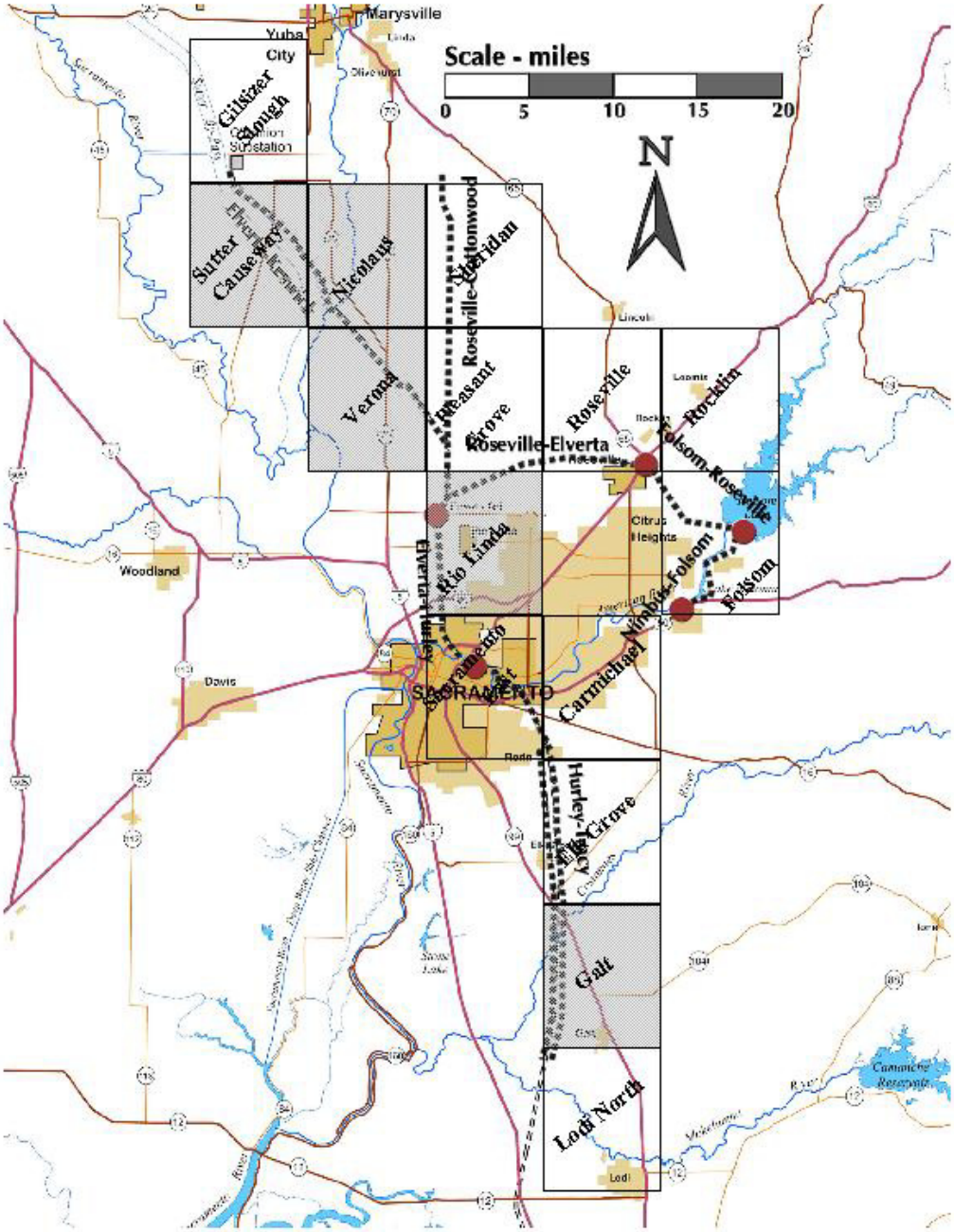
10.2 STATUS IN THE PROJECT AREA

Giant garter snakes occur in the drainage canals in the American Basin, which is north of the American River and west of the Natomas East Main Drain (Hansen and Brode 1980). West of the Yolo Bypass in Yolo County, giant garter snakes have been observed in the Willow Slough Bypass and near the Yolo County Landfill (USACE 2001, Jones & Stokes 1990). Because giant garter snakes do not occur in large rivers, the American and Sacramento rivers are considered unsuitable habitats. Occurrences have been noted in the CNDDB for Rio Linda, Nicolaus, and Verona quadrangle maps, near the O'Banion-Elverta transmission line, and in the Galt quadrangle near the southern end of the Hurley-Tracy line (CNDDB 2001) (Figure 10 1).

10.3 PROJECT EFFECTS

Because the giant garter snake is a Federally listed and State-listed threatened species, effects were considered significant if they would substantially disrupt, diminish, or reduce populations or habitat for this species.

Giant garter snakes could be directly affected by maintenance activity associated with any disturbance of levees or ditches. However, because suitable habitat is limited to ditches and small tributaries in open agricultural areas, little vegetation management activity is likely to take place. They could also be indirectly affected by enhancing the habitat of their predators.



Source: CNDDB 2001

FIGURE 10-1. REPORTED OCCURRENCES OF GIANT GARTER SNAKE IN THE STUDY AREA (SHADED QUADRANGLES)

10.3.1 NO-ACTION ALTERNATIVE

Vegetation Maintenance. Because suitable giant garter snake habitat is limited to ditches and small tributaries in open agricultural areas, little vegetation management activity is likely to take place in these areas under the no-action alternative.

Access Road Maintenance. No access roads cross, or are adjacent to, suitable giant garter snake habitat within the study area.

Transmission Line Maintenance. Routine patrols and repairs of to transmission lines could occur in areas of giant garter snake habitat. The greatest possibility of affecting the snake would be from running over a snake with a vehicle. Transmission line repairs would be localized, and the noise and activity would likely cause the giant garter snake to relocate.

10.3.2 PROPOSED ACTION

Vegetation Maintenance. Because suitable giant garter snake habitat is limited to ditches and small tributaries in open agricultural areas, little vegetation management activity is likely to take place in these areas under the proposed action. These are already low-growth, low-maintenance vegetation communities that the proposed action encourages.

Access Road Maintenance. No access roads cross, or are adjacent to, suitable giant garter snake habitat within the study area.

Transmission Line Maintenance. Routine patrols and repairs of to transmission lines could occur in areas of giant garter snake habitat. The greatest possibility of affecting the snake would be from running over a snake with a vehicle. Transmission line repairs would be localized, and the noise and activity would likely cause the giant garter snake to relocate.

10.4 INTERRELATED AND INTERDEPENDENT ACTIONS AND THEIR EFFECTS

No interrelated or interdependent actions that would affect listed or proposed species have been identified.

10.5 CUMULATIVE EFFECTS

Neither the no-action alternative nor the proposed action would combine with any known State, local, or private actions to result in cumulative impacts.

10.6 AVOIDANCE MEASURES

To avoid adverse effects to the giant garter snake, Western would

- Avoid routine maintenance activities within 200 ft of the banks of giant garter snake aquatic habitat and confine movement of equipment to existing roadways to minimize habitat disturbance to the maximum extent feasible. If clearing or grading activities were required within giant garter snake habitat, a qualified biologist would be present during all operations. Vehicle speeds would not exceed 15 miles per hour (mph) on unimproved access routes;

- Schedule ground-disturbing maintenance activities within habitat so that they occur between May 1 and October 1. This is the active period for giant garter snakes and direct mortality is lessened, because snakes are expected to actively move to avoid danger;
- Educate maintenance personnel to recognize giant garter snakes and their habitats. Specific information regarding giant garter snake avoidance measures would be provided to all Western maintenance employees and contractors prior to work in areas containing giant garter snake habitat;
- Avoid the use of herbicides in and around giant garter snake habitat; and
- Halt construction if a giant garter snake is observed within a maintenance or construction area, until it is determined that the snake will not be harmed. If necessary, the biological monitor would move the snake, by hand, from the maintenance or construction area to a safe location.

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11.0 SWAINSON'S HAWK

11.1 BACKGROUND

11.1.1 STATUS, DISTRIBUTION, AND LIFE HISTORY

The Swainson's hawk is State-listed as a threatened species. This species is not Federally listed. The Swainson's hawk occurs in California only during the breeding season (March through July) and winters in South America. Historically, the Swainson's hawk's breeding range in California included the Great Basin and the Sacramento and San Joaquin valleys; it is also known to nest along the coast in central and southern California and, in isolated occurrences, in the Colorado and Mojave deserts (Bloom 1980). Today, Swainson's hawks nest in some of the previously occupied regions of the State, but the number of breeding birds has been greatly reduced throughout major portions of the species' range (DFG 1994). Swainson's hawks have been extirpated in coastal and central California. Although most Swainson's hawks migrate to South America, the species has wintered in the Delta annually since 1991 (Yee et al. 1991, Herzog 1996).

Swainson's hawks forage in large, open plains and grassland ecosystems. The widespread conversion of native grasslands to agricultural uses has reduced Swainson's hawk foraging habitat in the Central Valley primarily to intensively farmed agricultural fields and pasturelands (Estep 1989). Hay, grain, and most row crops provide suitable Swainson's hawk foraging habitat during at least part of the breeding season. Swainson's hawks eat primarily small rodents and insects (Estep 1989).

Swainson's hawks usually nest in large, mature trees. Native trees are almost always used, although nests have been found in non-native eucalyptus (*Eucalyptus* sp.) trees and ornamental conifers. More than 87 percent of the known nest sites in the Central Valley are within riparian systems (Schlorff and Bloom 1984, Estep 1984). This is primarily a function of tree availability and not a preference for large riparian stands or the presence of other components of a riparian forest. Swainson's hawks also nest in mature roadside trees, isolated individual trees in agricultural fields, small groves of oaks, and trees around farm houses (DFG 1994).

11.1.2 REASON FOR DECLINE

Conversion of native grassland and woodland communities to agricultural uses is believed to be the primary cause for the decline of the Swainson's hawk. Pesticide contamination, mortality during migration or on the South American wintering grounds, poisoning by toxic chemicals including pesticides on the South American wintering grounds, disturbance on the breeding grounds, and competition with other raptors may have also contributed to the species' decline. Remaining populations of Swainson's hawks in California have shifted into areas that continue to provide suitable nesting habitat and suitable agricultural foraging habitats (such as alfalfa and other hay crops) in close proximity.

11.2 STATUS IN THE PROJECT AREA

Swainson's hawk nests are known to occur along the Sacramento River and portions of the Yolo Bypass (USACE 2001). There are records of nesting along the Lower American River near the confluence with the Sacramento River (USACE 2001). This species does not occur elsewhere along the Upper or Lower American River. The CNDDB notes occurrences of Swainson's hawk in 8 of the 15 quadrangle maps covered by the project (Figure 11-1). Though occurrences of Swainson's hawk were not noted during the biological survey, transmission lines where Swainson's hawk habitat may exist are O'Banion-Elverta, Roseville-Elverta (and adjacent east-west segment of Cottonwood-Roseville), and Hurley-Tracy.

11.3 PROJECT EFFECTS

Because Swainson's hawk is a State-listed threatened species, effects were considered significant if they would substantially disrupt, diminish, or reduce populations or habitat for this species, which could lead to Federal listing.

11.3.1 NO-ACTION ALTERNATIVE

Vegetation Maintenance. Swainson's hawk could be affected by manual tree removal or manual/mechanical trimming activities under the no-action alternative. Maintenance activity could destroy active Swainson's hawk nests or could disturb nesting pairs during the breeding season (March through July). However, Western's maintenance employees are trained to recognize raptor nests, and the hawk's tendency to nest in isolated trees or small groves of oaks reduce the likelihood that vegetation maintenance would involve significant topping of trees.

Access Road Maintenance. Access road maintenance would not affect bird habitat, although associated vegetation removal activities could have effects as listed above.

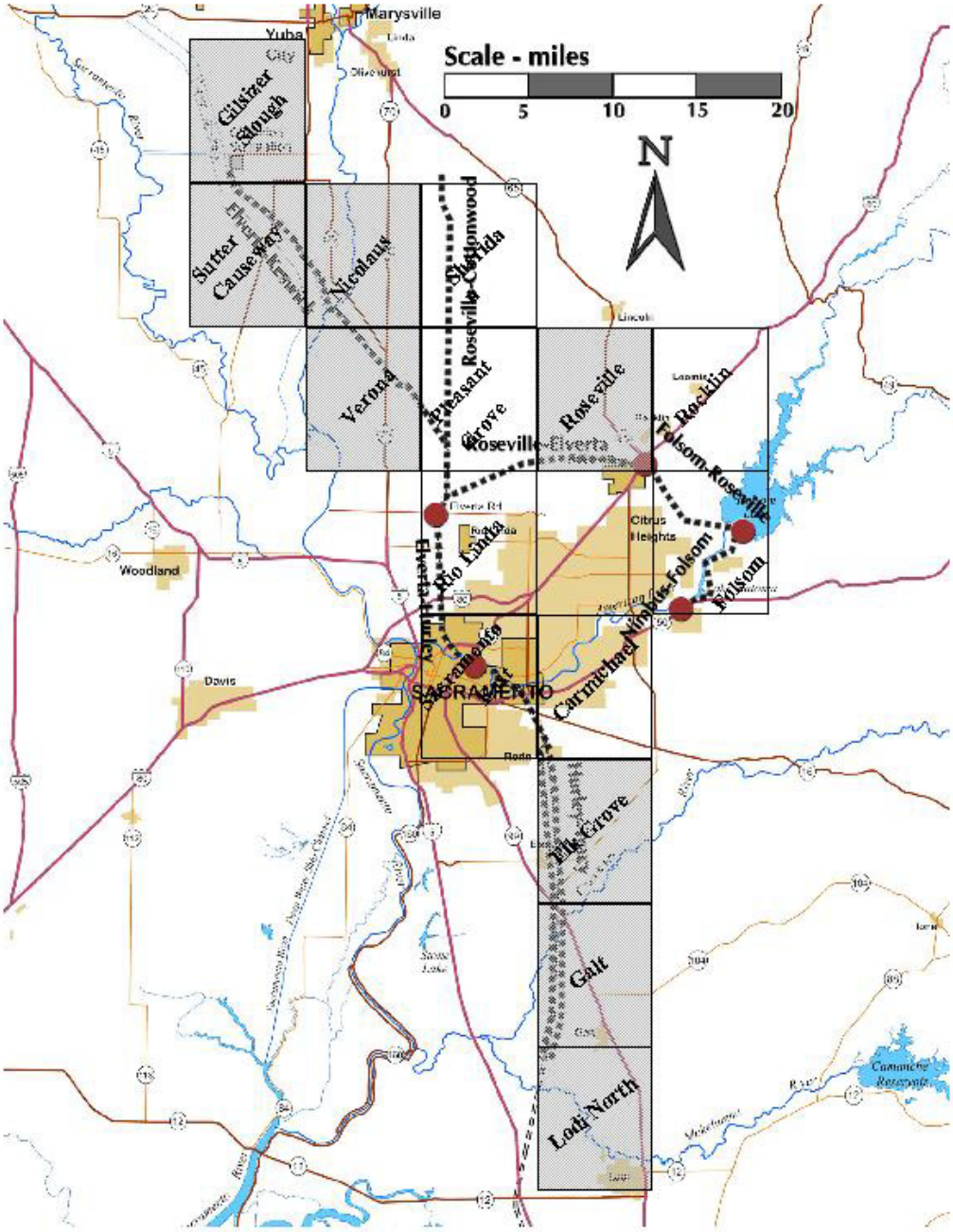
Transmission Line Maintenance. Transmission line maintenance would have no effect on bird habitat.

11.3.2 PROPOSED ACTION

Vegetation Maintenance. Swainson's hawk could be affected by manual tree removal or manual/mechanical trimming activities as described under the no-action alternative, above. Although herbicides selected for use by Western have low toxicity to animals, direct spraying of birds or hatchlings could result in impaired health.

Access Road Maintenance. Access road maintenance and reconstruction would not affect bird habitat, although associated vegetation removal activities could have effects as listed above.

Transmission Line Maintenance. Transmission line maintenance would have no effect on bird habitat.



Source: CNDDB 2001

FIGURE 11-1. REPORTED OCCURRENCES OF SWAINSON'S HAWK IN THE STUDY AREA (SHADED QUADRANGLES)

11.4 INTERRELATED AND INTERDEPENDENT ACTIONS AND THEIR EFFECTS

No interrelated or interdependent actions that would affect listed or proposed species have been identified.

11.5 CUMULATIVE EFFECTS

Neither the no-action alternative nor the proposed action would combine with any known State, local, or private actions to result in cumulative impacts.

11.6 AVOIDANCE MEASURES

To reduce or avoid potential impacts to Swainson's hawk, Western would

- Perform preconstruction surveys for Swainson's hawk within the ROW prior to conducting maintenance activities,
- Defer routine maintenance in the vicinity of an active nest until after the nesting season,
- Avoid removal of nest trees (unless necessary for transmission line safety and to prevent fire) and monitor nest sites, and
- Establish and maintain a 200-ft buffer for maintenance activities during the breeding season (March through July). This buffer could be adjusted, based on changes in sensitivity exhibited by birds over the course of the nesting season and the type of maintenance performed (high noise or human activity such as mechanical vegetation maintenance methods versus low noise or human activity such as semi-annual patrols).

12.0 WESTERN YELLOW-BILLED CUCKOO

12.1 BACKGROUND

12.1.1 STATUS, DISTRIBUTION, AND LIFE HISTORY

The western yellow-billed cuckoo is a State-listed endangered species. This species is not Federally listed. In 1986 and 1987, the DFG conducted field surveys to determine the statewide distribution and population size for the cuckoo. Breeding pairs were found only along the Sacramento River in Butte, Glenn, and Colusa counties; along the Feather River in Sutter County; along the south fork of the Kern River; and along the Santa Ana, Armargosa, and lower Colorado rivers. In addition, in 1992, one breeding pair of cuckoos was found along Toe Drain (Butte Slough) in the lower Sutter Bypass in Sutter County, and two breeding pairs were found in 1993 in the same area (USACE 2001).

The cuckoo is an uncommon to rare summer resident of valley foothill and desert riparian habitats in scattered locations in California. Along the Colorado River, breeding population on the California side was estimated at 180 pairs (Gaines 1977a). Perhaps 100, or fewer, additional pairs reside in the Sacramento and Owens valleys; along the South Fork of the Kern River, Kern County; along the Santa Ana River, Riverside County; and along the Amargosa River, Inyo and San Bernardino counties. They also may nest along San Luis Rey River, San Diego County. The western yellow-billed cuckoo was formerly much more common and widespread throughout lowland California, but its numbers have been drastically reduced by habitat loss (Grinnell and Miller 1944, Gaines 1974b, Garrett and Dunn 1981).

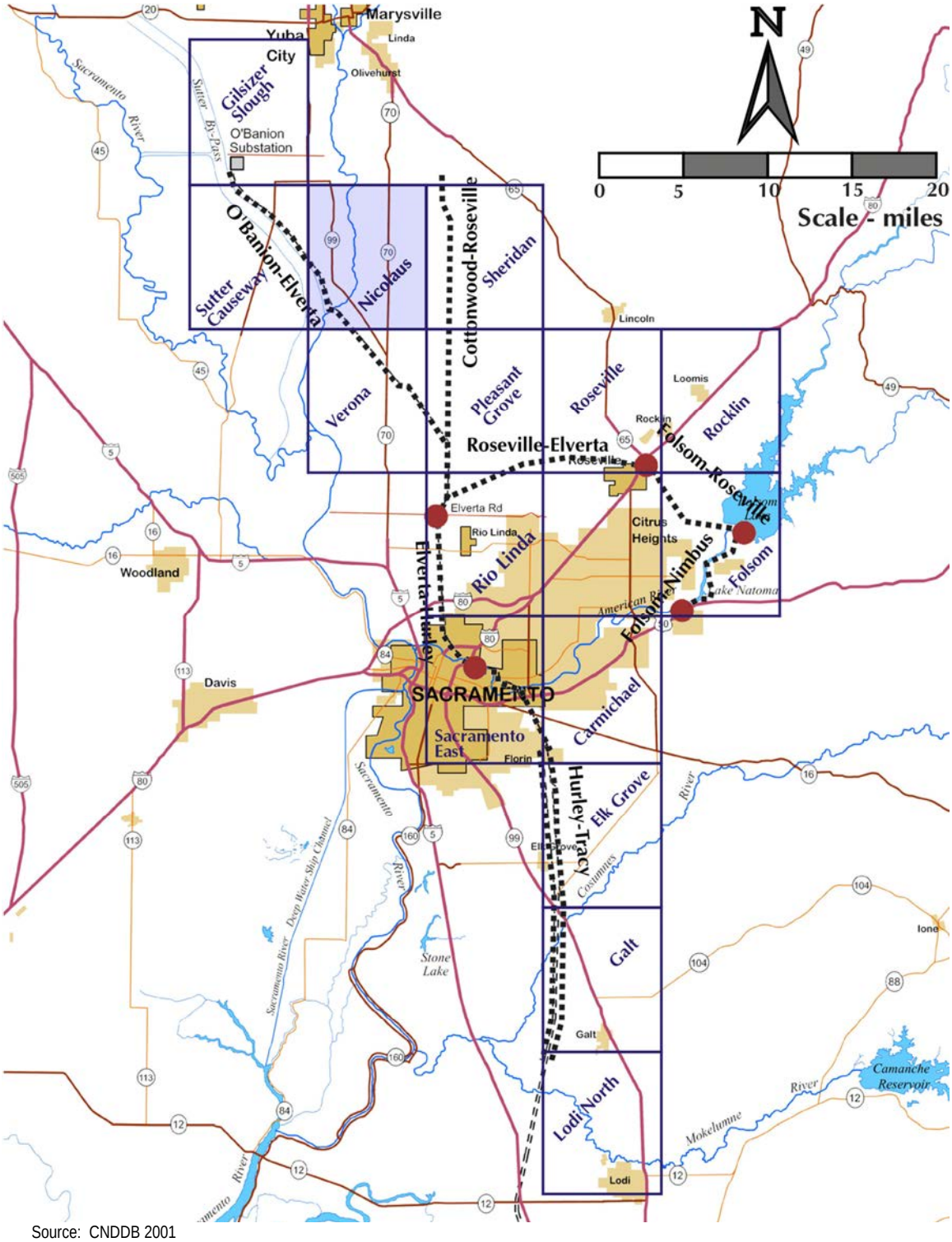
The western yellow-billed cuckoo feeds on grasshoppers, cicadas, caterpillars, and other larger insects from foliage. It occasionally preys on frogs or lizards or feeds on fruit (Bent 1940, Preble 1957). It nests and roosts in densely foliaged deciduous trees and shrubs, especially willows. Willow is almost always a dominant component of the vegetation. However, in the Sacramento Valley, it also uses adjacent orchards, especially walnut. The nest is a flimsy, open cup of twigs built on a horizontal limb of a tree or shrub at a height of 2 to 25 ft. When breeding, it is restricted to river bottoms and other mesic habitats where humidity is high.

12.1.2 REASON FOR DECLINE

This cuckoo is threatened by loss and degradation of its habitat. Adverse impacts to cuckoo habitat are from land clearing for urban and suburban development and for agriculture, human disturbance (such as camping), fire in riparian habitat, livestock trampling and grazing on tree saplings, non-native plant invasion (such as tamarisk and giant reed), flood control projects, groundwater pumping, and surface water diversion.

12.2 STATUS IN THE PROJECT AREA

According to the CNDDB, the western yellow-billed cuckoo has been observed only in the Nicolaus quadrangle, near the O'Banion-Elverta transmission line (Figure 12-1). No suitable cuckoo habitat was observed in this area during the biological survey.



Source: CNDDB 2001

FIGURE 12-1. REPORTED OCCURRENCES OF WESTERN YELLOW-BILLED CUCKOO IN THE STUDY AREA (SHADED QUADRANGLES)

12.3 PROJECT EFFECTS

Because the western yellow-billed cuckoo is a State-listed endangered species, effects were considered significant if they would have the potential to disrupt, diminish, or reduce populations or habitat for this species, which would lead to Federal listing.

The western yellow-billed cuckoo may be affected by maintenance-related activities under either the no-action alternative or the proposed action. Maintenance activity could destroy active cuckoo nests or could disturb nesting pairs, which would lead to the destruction of eggs or the death of young. However, the biological survey performed for the EA did not identify suitable cuckoo habitat in the Nicolaus quadrangle area; therefore, adverse impacts are unlikely.

12.4 INTERRELATED AND INTERDEPENDENT ACTIONS AND THEIR EFFECTS

No interrelated or interdependent actions that would affect listed or proposed species have been identified.

12.5 CUMULATIVE EFFECTS

Neither the no-action alternative nor the proposed action would combine with any known State, local, or private actions to result in cumulative impacts.

12.6 AVOIDANCE MEASURES

For the Western yellow-billed cuckoo, no avoidance measures are necessary because no suitable habitat was identified in the study area. Western would develop avoidance measures if suitable habitat is identified or if Western yellow-billed cuckoos are sighted near the study area.

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13.0 BANK SWALLOW

13.1 BACKGROUND

13.1.1 STATUS, DISTRIBUTION, AND LIFE HISTORY

The bank swallow is State-listed as threatened. This species is not Federally listed. Bank swallows are migrants that breed in California and spend winters in South America. In California, the bank swallow breeds in the Central Valley along the upper Sacramento River where the river meanders in a mostly natural state. The bank swallow requires bluffs or banks with soft sand and sandy loam soil immediately adjacent to still or running water. The species constructs burrows 2 – 3 ft deep into the nearly vertical eroding banks. The bank swallow breeds and lays a clutch of 4 to 5 eggs in April; the young hatch in May, and 2 to 3 young are fledged by July. Bank swallows make one breeding attempt each year. The adults and young of the year remain along the riverbanks until they migrate in fall.

The bank swallow historically occurred along the larger lowland rivers throughout California, with the exception of southern California, where the species occurred principally along the coast and at the mouths of large rivers (Laymon et al. 1988, Garrison and Humphrey 1986). This species has now been extirpated from southern California and its range has been reduced by 50 percent since 1900 (Laymon et. al.1988, DFG 1997). It is currently confined to the Sacramento River above the town of Colusa and is scattered in colonies throughout northern California. The bank swallow is found along several rivers in the lower Sacramento River Valley, including the Sacramento River, Feather River, Cache Creek, Cosumnes River, and American River (Humphrey and Garrison 1986, Laymon et al. 1988, USACE 2001). Bank swallows historically nested along the Lower American River. The most recently recorded nesting activity along the Lower American River occurred in the late 1980s (USACE 2001).

During a survey conducted in 1987, a total of 111 colonies were located statewide (Laymon et al. 1988). Seventy-five percent of the State's bank swallow population is concentrated on the banks of Central Valley rivers, including about 50 to 60 colonies along the Sacramento River (DFG 1994). No bank swallow colonies have been found along the Sacramento River downstream from the confluence with the Feather River (USACE 2001).

13.1.2 REASON FOR DECLINE

The bank swallow has been eliminated from southern California because most rivers and natural waterways historically used by bank swallows have been converted into flood control channels. Elsewhere in California, riprapping of natural riverbanks and flood control projects have caused the decline of this species (DFG 1997).

13.2 STATUS IN THE PROJECT AREA

Bank swallows historically nested along the Lower American River; however, the most recent recorded nesting activity occurred there in the late 1980s (USACE 2001). The bank swallow is currently confined to the Sacramento River above the town of Colusa and is scattered in colonies in northern California, all of which are outside of the project area (USACE 2001).

13.3 PROJECT EFFECTS

Because the bank swallow is a State-listed endangered species, effects were considered significant if they would have the potential to diminish or reduce populations or habitat for this species, which would lead to Federal listing.

Nesting bank swallows could be directly affected by maintenance activities along riverbanks on the Lower American River at the Hurley-Tracy transmission line crossing if nests occur within or close to the maintenance site. Other suitable habitat could exist on the Feather River (O'Banion-Elverta transmission line).

13.4 INTERRELATED AND INTERDEPENDENT ACTIONS AND THEIR EFFECTS

No interrelated or interdependent actions that would affect listed or proposed species have been identified.

13.5 CUMULATIVE EFFECTS

Neither the no-action alternative nor the proposed action would combine with any known State, local, or private actions to result in cumulative impacts.

13.6 AVOIDANCE MEASURES

Although suitable habitat may exist in the project area, there is no evidence of bank swallows at ROW crossings. However, to reduce or avoid adverse effects to the bank swallow, Western would

- Avoid conducting ROW maintenance activities that could cause ground disturbance where suitable habitat exists at ROW crossings on the American River, Feather River, and Cosumnes River;
- Conduct pre-maintenance surveys by a qualified biologist to identify any habitat; and
- Define a 100-ft buffer on each side of all perennial watercourses. In this buffer, no chemicals would be mixed, no open petroleum products would be allowed and only hand clearing of vegetation would be permitted (no foliar application of herbicides). This buffer would not apply to cut-stump treatments using herbicides approved for aquatic use by the EPA, subject to any additional restrictions imposed by the State of California.

14.0 RIPARIAN (SAN JOAQUIN VALLEY) WOODRAT

14.1 BACKGROUND

14.1.1 STATUS, DISTRIBUTION, AND LIFE HISTORY

The San Joaquin Valley riparian woodrat (*Neotoma fuscipes riparia*) is Federally listed as endangered and is State-listed as a species of special concern. The San Joaquin Valley riparian woodrat is known only to occur in Stanislaus and San Joaquin counties along the San Joaquin, Stanislaus, and Tuolumne rivers, as well as at Caswell State Park in San Joaquin County near the confluence of the Stanislaus and San Joaquin rivers (USFWS 2000a).

Nothing specific has been recorded about the habitat of riparian woodrats. A few riparian woodrats have been captured in traps set in runways of riparian brush rabbits. These riparian woodrats occasionally use nest boxes placed in trees for wood ducks along the lower San Joaquin and Tuolumne rivers. Apparently, riparian woodrats also eat the eggs of the wood ducks. The San Joaquin Valley is generally devoid of suitable habitat for riparian woodrats, except along rivers where trees and brush were found. Thus, this population is confined to riparian habitat (USFWS 2000a).

14.1.2 REASON FOR DECLINE

Trapping programs along the Tuolumne and Stanislaus rivers have resulted in a few captures only in Caswell State Park. The current status of this population is unknown. Regulation of stream flow, stream channelization, cultivation of the floodplains, and brush and tree removal have diminished available riparian habitat. Removal of undergrowth and large trees with dead and hollow limbs in parks has reduced habitat further. If current trends continue, additional habitat loss can be expected. During floods, there are few or no refuges for riparian woodrats, as nearly all land bordering the rivers is cultivated. A population is still extant in the general area of the type locality, but its demographic features are unknown (USFWS 2000a).

14.2 STATUS IN THE PROJECT AREA

There are no reported sightings of the riparian woodrat in the study area; however, the biological survey identified riparian areas that could form suitable habitat along the southern portion of the Hurley-Tracy transmission line, near the Cosumnes River Preserve and along tributaries to the Cosumnes River.

14.3 PROJECT EFFECTS

14.3.1 NO-ACTION ALTERNATIVE

Vegetation Maintenance. Under the no-action alternative, vegetation removal, through either manual or mechanical methods, could be destructive to vegetation used for cover and nesting.

Access Road Maintenance. Access road maintenance activities would be localized, of short duration, and have little effect on riparian woodrat habitat. Some habitat fragmentation could

occur, but access roads are generally short (less than 1 mi) and the access road ROW width is only 30 ft.

Transmission Line Maintenance. Routine patrols by rubber-tired vehicles would have no impact on riparian woodrat habitat. Transmission line repairs by heavy equipment could have a short-term effect from trampling of vegetation, but such repair activities would be localized (such as at the base of a tower).

14.3.2 PROPOSED ACTION

Vegetation Maintenance. Under the proposed action, establishment of low-growth vegetation could provide a long-term beneficial effect. The proposed action would require less active management and, therefore, less vehicle traffic and potential for vehicle damage.

Access Road Maintenance. Access road maintenance activities would be localized, of short duration, and have little effect on riparian woodrat habitat. Some habitat fragmentation could occur, but access roads are generally short (less than 1 mi) and the access road ROW width is only 30 ft.

Transmission Line Maintenance. Routine patrols by rubber-tired vehicles would have no impact on riparian woodrat habitat. Transmission line repairs by heavy equipment could have a short-term effect from trampling of vegetation, but such repair activities would be localized (such as at the base of a tower).

14.4 INTERRELATED AND INTERDEPENDENT ACTIONS AND THEIR EFFECTS

No interrelated or interdependent actions that would affect listed or proposed species have been identified.

14.5 CUMULATIVE EFFECTS

Neither the no-action alternative nor the proposed action would combine with any known State, local, or private actions to result in cumulative impacts.

14.6 AVOIDANCE MEASURES

To avoid adverse effects to the riparian woodrat, Western would maintain, where appropriate, the low-growth elements (brush and shrubs) of suitable riparian habitat within the species range. Where conductor clearance permits, some trees native to the riparian habitat could also be allowed to grow at the ROW vegetation edges to minimize habitat fragmentation. Overall, establishment of this modified riparian habitat would lead to fewer disturbances for ROW maintenance, and would be consistent with the goals of the proposed action.

15.0 RIPARIAN BRUSH RABBIT

15.1 BACKGROUND

15.1.1 STATUS, DISTRIBUTION, AND LIFE HISTORY

The riparian brush rabbit is a small cottontail that is secretive by nature. Historically, riparian brush rabbits inhabited dense, brushy areas of valley riparian forests, marked by extensive thickets of wild rose (*Rosa* spp.), blackberries (*Rubus* spp.), and willows (*Salix* spp.). Thriving mats of low-growing vines and shrubs serve as ideal living sites where they build tunnels under and through the vegetation. Suitable existing habitat for riparian brush rabbits is characterized by an abundance of woody ground litter and fewer willows, signifying areas not subject to regular or heavy flooding. Willows are mostly found where flooding occurs regularly. There is no connecting habitat to allow the riparian brush rabbit to expand beyond the one known population at Caswell Memorial State Park to suitable habitat in other areas (California State University 2002).

Riparian brush rabbits feed at the edges of shrub cover rather than in large openings. Their diet consists of herbaceous vegetation, such as grasses, sedges, forbs, and buds; bark; and leaves of woody plants. One preferred plant is green clover (*Trifolium wormskiolodii*). They consume herbaceous plants found along trails, fire breaks, or at the edge of brushy areas, and they eat the leaves, bark, and buds of many types of woody shrubs and vines within and at the edges of thickets (California State University 2002).

The approximate breeding season of riparian brush rabbits occurs from January to May. Although males are capable of breeding all year long, females are only receptive during this period. After 27 to 30 days, the female gives birth to a litter of 3 or 4. In favorable years, females may produce 3 or 4 litters, resulting in 9 to 16 young. The young are born in a shallow burrow or cavity lined with grasses and fur and covered by a plug of dried vegetation. With seminaked bodies and eyes closed, the young remain in the nest for about 2 weeks, after which their eyes open. It is not until 4 or 5 months after birth that they are mature. Although these rabbits have a high reproductive rate five out of six rabbits typically do not survive to the next breeding season (California State University 2002).

For the most part, riparian brush rabbits remain hidden under protective shrub cover. They seldom venture more than about 3 ft from cover and refrain from too much movement. A typical response if danger presents itself is to retreat back into the cover rather than to be pursued in open areas. They have a limited ability to climb trees and bushes, which proves helpful during floods. They are active throughout the year and especially during twilight hours. Depending on the season, they are active from 2 to 4 hours. The least active hours are between 10:30 a.m. and 2:00 p.m.; however, they occasionally are active during this time, on overcast or cloudy days. Under certain conditions, basking in the sun takes place in the early morning and afternoon, either on a log or dry form (resting place for rabbits). Ideal basking sites are typically no more than a few inches from cover and less than about 18 inches above ground, with a partial, low overstory of small trees or vines for protection from aerial predators (California State University 2002).

Historically, the riparian brush rabbit is known to have occurred in riparian forests along the San Joaquin River and Stanislaus Rivers in Stanislaus and San Joaquin counties. They probably also occupied streamside communities along the other tributaries of the San Joaquin River on the valley floor. One population estimate was about 110,000 individuals residing in this historic range (California State University 2002).

Today, the largest remaining fragment of habitat and only extant population are found along the Stanislaus River in Caswell Memorial State Park, San Joaquin County, California. No other sightings of riparian brush rabbits outside the park have been reported in over 40 years. The last population estimate was 213 to 312 individuals at the park in January 1993. Anecdotal information suggests that the current (January 1997) population size is much lower because more than 80 percent of the Park has been flooded since about January 1st and recent signs of rabbits on the few narrow spots above water were extremely sparse (California State University 2002).

15.1.2 REASON FOR DECLINE

The dramatic decline of the riparian brush rabbit began in the 1940s with the building of dams, constructed for irrigation and flood control, on the major rivers of the Central Valley. Protection from flooding resulted in conversion of floodplains to croplands and the consequent reduction and fragmentation of remaining riparian communities. The most serious problem, however, has been the lack of suitable habitat above the level of regular floods where the animals could find food and cover for protection from weather and predators (California State University 2002).

Aside from the periodic threats from flooding, wildfire poses a major threat due to long-term fire suppression in the park and the consequent increase in fuel from dead leaves, woody debris, and decadent, flammable shrubs. Other factors that could affect this population are diseases common to rabbits in California, such as tularemia, plague, myxomatosis, silverwater, encephalitis, listeriosis, Q-fever, and brucellosis. Competition with the more fecund and vagile desert cottontail potentially is another threat (California State University 2002).

15.2 STATUS IN THE PROJECT AREA

There are no reported sightings of the riparian brush rabbit in the study area; however, the biological survey identified riparian areas that could form suitable habitat along the southern portion of the Hurley-Tracy transmission line, near the Cosumnes River Preserve and along tributaries to the Cosumnes River.

15.3 PROJECT EFFECTS

15.3.1 NO-ACTION ALTERNATIVE

Vegetation Maintenance. Under the no-action alternative, vegetation removal, through either manual or mechanical methods, could be destructive to vegetation used for cover and nesting.

Access Road Maintenance. Access road maintenance activities would be localized, of short duration, and have little effect on riparian brush rabbit habitat. Some habitat fragmentation could occur, but access roads are generally short (less than 1 mi) and the access road ROW width is only 30 ft.

Transmission Line Maintenance. Routine patrols by rubber-tired vehicles would have no impact on riparian brush rabbit habitat. Transmission line repairs by heavy equipment could have a short-term effect from trampling of vegetation, but such repair activities would be localized (such as at the base of a tower).

15.3.2 PROPOSED ACTION

Vegetation Maintenance. Under the proposed action, establishment of low-growth vegetation could provide a long-term beneficial effect. The proposed action would require less active management and, therefore, less vehicle traffic and potential for vehicle damage.

Access Road Maintenance. Access road maintenance activities would be localized, of short duration, and have little effect on riparian brush rabbit habitat. Some habitat fragmentation could occur, but access roads are generally short (less than 1 mi) and the access road ROW width is only 30 ft.

Transmission Line Maintenance. Routine patrols by rubber-tired vehicles would have no impact on riparian brush rabbit habitat. Transmission line repairs by heavy equipment could have a short-term effect from trampling of vegetation, but such repair activities would be localized (such as at the base of a tower).

15.4 INTERRELATED AND INTERDEPENDENT ACTIONS AND THEIR EFFECTS

No interrelated or interdependent actions that would affect listed or proposed species have been identified.

15.5 CUMULATIVE EFFECTS

Neither the no-action alternative nor the proposed action would combine with any known State, local, or private actions to result in cumulative impacts.

15.6 AVOIDANCE MEASURES

To avoid adverse effects to the riparian brush rabbit, Western would maintain, where appropriate, the low-growth elements (brush and shrubs) of suitable riparian habitat within the species range. Where conductor clearance permits, some trees native to the riparian habitat could also be allowed to grow at the ROW vegetation edges to minimize habitat fragmentation. Overall, establishment of this modified riparian habitat would lead to fewer disturbances for ROW maintenance, and would be consistent with the goals of the proposed action.

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16.0 BOGGS LAKE HEDGE-HYSSOP

16.1 BACKGROUND

16.1.1 STATUS, DISTRIBUTION, AND LIFE HISTORY

Boggs Lake hedge-hyssop is State-listed as endangered. This species is not Federally listed. It is a small, semi-aquatic, herbaceous annual found in shallow waters or moist clay soils of vernal pools and lake margins in scattered sites from Modoc County south to Fresno County. It has not been reported from any valley floor vernal pools south of San Joaquin County, but it does occur in five vernal pools in the Fresno County-Madera County Table Mountain complex near Friant.

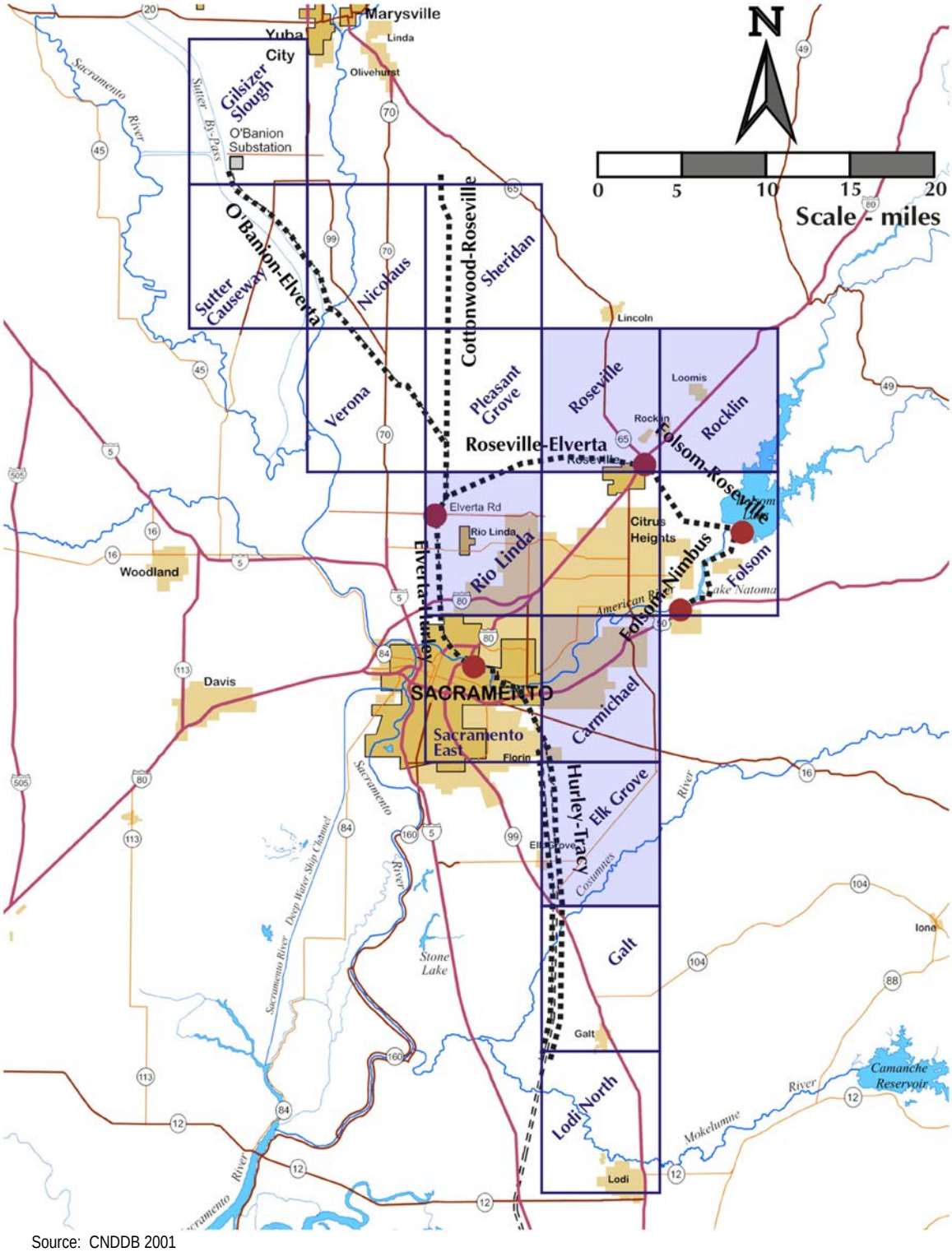
When first described in 1954, the Boggs Lake hedge-hyssop was known only from Boggs Lake in Lake County and, until the late 1980s, from only a limited number of occurrences in vernal pool habitat in the State. Surveys of vernal pool habitat in recent years have located many additional occurrences of this species. As of 1999, 79 occurrences have been documented within 11 California counties, but it is not known how many of these occurrences remain because many were found during surveys in proposed project areas. The Boggs Lake hedge-hyssop occurs in vernal pools on private land and on lands owned and managed by Federal agencies. In addition, many of the known sites occur at the edges of reservoirs and stock ponds, which probably should be considered temporary habitat at best.

16.1.2 REASON FOR DECLINE

Although the known number of occurrences of the Boggs Lake hedge-hyssop has increased as more surveys have been conducted, its vernal pool habitat has been declining simultaneously. The Boggs Lake population has been declining yearly and is now at very low levels. Reasons for the decline are unknown; however, negative factors such as drought, habitat invasion by weedy upland species, and grazing by deer and horses may have all contributed to the decline. The DFG and the Game's Dales Lake Ecological Reserve supports a natural population and several transplanted populations in created vernal pools. Several other sites are known to incur varying levels of land disturbance that adversely affect the species, such as discing, grading, and overgrazing. The species tolerates light to moderate levels of grazing, but higher levels appear to be detrimental.

16.2 STATUS IN THE PROJECT AREA

Vernal pools were recorded along the Folsom-Nimbus, Folsom-Roseville, Roseville-Elverta, Cottonwood-Roseville, O'Banion-Elverta, and Hurley-Tracy transmission lines during the biological survey for the EA. The Boggs Lake hedge-hyssop was not identified during this survey, but it has been identified in 5 of the 15 USGS quadrangle maps covering the study area (Figure 16-1).



Source: CNDDB 2001

FIGURE 16-1. REPORTED OCCURRENCES OF BOGGS LAKE HEDGE-HYSSOP IN THE STUDY AREA (SHADED QUADRANGLES)

16.3 PROJECT EFFECTS

Vernal pools occur throughout the project area and are likely to be affected in one or more locations. Therefore, the Boggs Lake hedge-hyssop, or its habitat, could be affected by project-related activities in one or more locations.

Impacts on the Boggs Lake hedge-hyssop from general vegetation management (regardless of the method used) could include the following:

- Trampling, crushing, or removal of plant species;
- Altering topography, causing a vernal pool to drain;
- Changes in soil moisture, nutrient level, and soil structure due to compaction;
- Increases in turbidity from erosion or rutting by heavy equipment; and
- Increases in noxious weed invasion.

16.3.1 NO-ACTION ALTERNATIVE

Vegetation Maintenance. Under the no-action alternative, vehicles accessing the ROW for manual vegetation maintenance could cause damage to vernal pools, if present, adversely affecting vernal pool species by increasing turbidity, destroying plant and animal species, or altering the topography of the vernal pool. Mechanical methods could be similarly destructive to vernal pools.

Access Road Maintenance. The biological survey did not identify vernal pools along access roads in the study area.

Transmission Line Maintenance. Transmission line patrols and repairs could cause damage to vernal pools and vernal pool species by increasing turbidity, destroying plant and animal species within tire tracks, or altering the topography of the vernal pool.

16.3.2 PROPOSED ACTION

Vegetation Maintenance. Under the proposed action, the short-term (1- to 2-year) effects of establishing low-growth species in the ROW, possibly including removal of particular plant species, could affect vernal pools by vehicle traffic as described under the no-action alternative. Over the long term (greater than 2 years), the proposed action would require less active management, therefore, less vehicle traffic and potential for vehicle damage. In addition, the vegetation would be more stable, reducing the sudden effects that could damage vernal pool habitat. However, additional effects from the proposed action could be caused by herbicides affecting vernal pool vegetation (with likely effects to the invertebrate species) through overspray or runoff.

Access Road Maintenance. The biological survey did not identify vernal pools along access roads in the study area.

Transmission Line Maintenance. Transmission line patrols and repairs could cause damage to vernal pools and vernal pool species by increasing turbidity, destroying plant and animal species within tire tracks, or altering the topography of the vernal pool.

16.4 INTERRELATED AND INTERDEPENDENT ACTIONS AND THEIR EFFECTS

No interrelated or interdependent actions that would affect listed or proposed species have been identified.

16.5 CUMULATIVE EFFECTS

Neither the no-action alternative nor the proposed action would combine with any known State, local, or private actions to result in cumulative impacts.

16.6 AVOIDANCE MEASURES

To avoid adverse effects to the Boggs Lake hedge-hyssop, Western would establish buffer zones specific to the type of maintenance activity and season. These buffer zones are listed in Table 4-1.

17.0 SLENDER ORCUTT GRASS

17.1 BACKGROUND

17.1.1 STATUS, DISTRIBUTION, AND LIFE HISTORY

Slender Orcutt grass is Federally listed as threatened and State-listed as endangered. Slender Orcutt grass occurs in vernal pools within valley grassland and blue oak woodland. It has also shown an ability to colonize artificial habitats, such as the margins of stock ponds. Slender Orcutt grass is known from numerous widely distributed, disjunct populations in Lake, Sacramento, Shasta, Siskiyou, and Tehama counties. Of the approximately 45 known occurrences, about 40 are still extant. Most of the remaining populations are in Shasta and Tehama counties (Stone et al. 1988).

Agricultural conversion, airport construction, and wetland draining for mosquito abatement have eliminated several historically known populations. Many undocumented populations were probably lost during the intensive agricultural development that eliminated many vernal pools in the Central Valley. Urbanization, altered hydrology, off-highway vehicles, and competition from non-native plants variously threaten 23 populations (USFWS 1997).

17.1.2 REASON FOR DECLINE

Livestock grazing and associated trampling may or may not adversely affect vernal pool plants depending on, among other things, the kind of livestock, stocking level, season of use, and grazing duration. The intensity and, more importantly, the timing of this activity determine the level of impact to vernal pool plants. However, as long as the land remains in dry pasture, moderate grazing regimes appear to have little impact on Orcutt grasses (Stone et al. 1988).

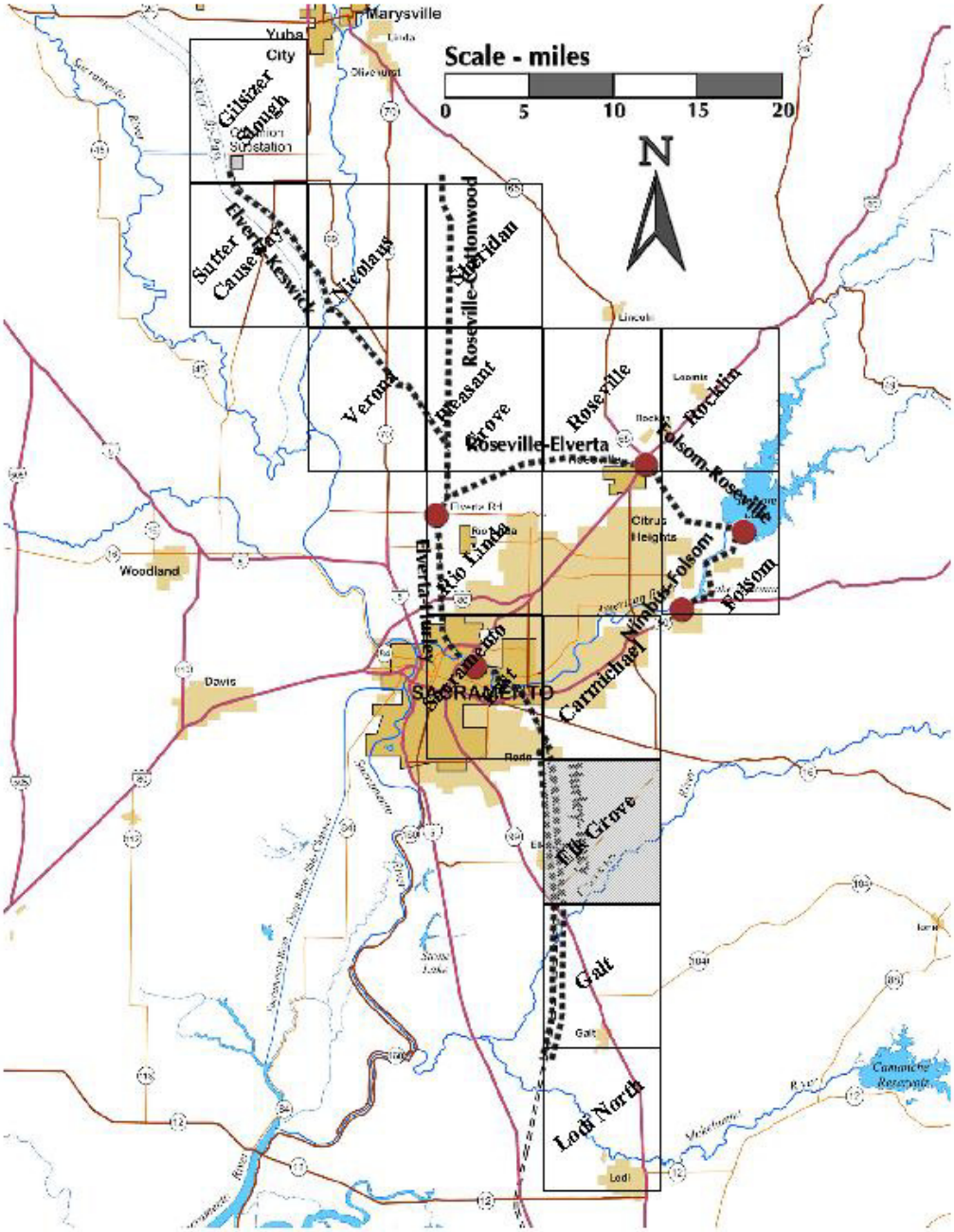
Human activities that alter the hydrology of vernal pools, including changes in the amount of water or the length of inundation, may directly and indirectly affect vernal pool plants. For example, a vernal pool known to contain slender Orcutt grass was channelized for mosquito abatement. It is likely that the population was extirpated as a result.

17.2 STATUS IN THE PROJECT AREA

Vernal pools were recorded along the Folsom-Nimbus, Folsom-Roseville, Roseville-Elverta, Cottonwood-Roseville, O'Banion-Elverta, and Hurley-Tracy transmission lines during the biological survey for the EA. Slender Orcutt grass was not observed during this survey, and has only been identified in the Elk Grove USGS quadrangle (Hurley-Tracy line) in the study area (Figure 17-1).

17.3 PROJECT EFFECTS

Vernal pools occur throughout the project area and are likely to be affected in one or more locations. Therefore, the slender Orcutt grass, or its habitat, could be affected by project-related activities in one or more locations.



Source: CNDDB 2001

FIGURE 17-1. REPORTED OCCURRENCES OF SLENDER ORCUTT GRASS IN THE STUDY AREA (SHADED QUADRANGLES)

Impacts on slender Orcutt grass from general vegetation management (regardless of the method used) could include the following:

- Trampling, crushing, or removal of plant species;
- Altering topography, causing a vernal pool to drain;
- Changes in soil moisture, nutrient level, and soil structure due to compaction;
- Increases in turbidity from erosion or rutting by heavy equipment; and
- Increases in noxious weed invasion.

17.3.1 NO-ACTION ALTERNATIVE

Vegetation Maintenance. Under the no-action alternative, vehicles accessing the ROW for manual vegetation maintenance could cause damage to vernal pools, if present, adversely affecting vernal pool species by increasing turbidity, destroying plant and animal species, or altering the topography of the vernal pool. Mechanical methods could be similarly destructive to vernal pools.

Access Road Maintenance. The biological survey did not identify vernal pools along access roads in the study area.

Transmission Line Maintenance. Transmission line patrols and repairs could cause damage to vernal pools and vernal pool species by increasing turbidity, destroying plant and animal species within tire tracks, or altering the topography of the vernal pool.

17.3.2 PROPOSED ACTION

Vegetation Maintenance. Under the proposed action, the short-term (1- to 2-year) effects of establishing low-growth species in the ROW, possibly including removal of particular plant species, could affect vernal pools by vehicle traffic as described under the no-action alternative. Over the long term (greater than 2 years), the proposed action would require less active management, therefore, less vehicle traffic and potential for vehicle damage. In addition, the vegetation would be more stable, reducing the sudden effects that could damage vernal pool habitat. However, additional effects from the proposed action could be caused by herbicides affecting vernal pool vegetation (with likely effects to the invertebrate species) through overspray or runoff.

Access Road Maintenance. The biological survey did not identify vernal pools along access roads in the study area.

Transmission Line Maintenance. Transmission line patrols and repairs could cause damage to vernal pools and vernal pool species by increasing turbidity, destroying plant and animal species within tire tracks, or altering the topography of the vernal pool.

17.4 INTERRELATED AND INTERDEPENDENT ACTIONS AND THEIR EFFECTS

No interrelated or interdependent actions that would affect listed or proposed species have been identified.

17.5 CUMULATIVE EFFECTS

Neither the no-action alternative nor the proposed action would combine with any known State, local, or private actions to result in cumulative impacts.

17.6 AVOIDANCE MEASURES

To avoid adverse effects to slender Orcutt grass, Western would establish buffer zones specific to the type of maintenance activity and season. These buffer zones are listed in Table 4-1.

18.0 SACRAMENTO ORCUTT GRASS

18.1 BACKGROUND

18.1.1 STATUS, DISTRIBUTION, AND LIFE HISTORY

Sacramento Orcutt grass is Federally and State-listed as endangered. Sacramento Orcutt grass is endemic to Sacramento County. Only nine historical and recent occurrences are documented, all within a region of approximately 135 square mi in the eastern part of the county. The species remains at about seven known sites, inhabiting relatively large, deep vernal pools. The modern range of the species is somewhat smaller than the known historical range because two known populations have been extirpated (USFWS 1997).

18.1.2 REASON FOR DECLINE

The species has declined mainly due to severe habitat loss caused by agricultural and urban development. Because the human population of the Central Valley is growing rapidly, numerous populations of Orcutt grasses, including Sacramento Orcutt grass, have been extirpated and continue to be threatened by urban development projects (USFWS 1997).

18.2 STATUS IN THE PROJECT AREA

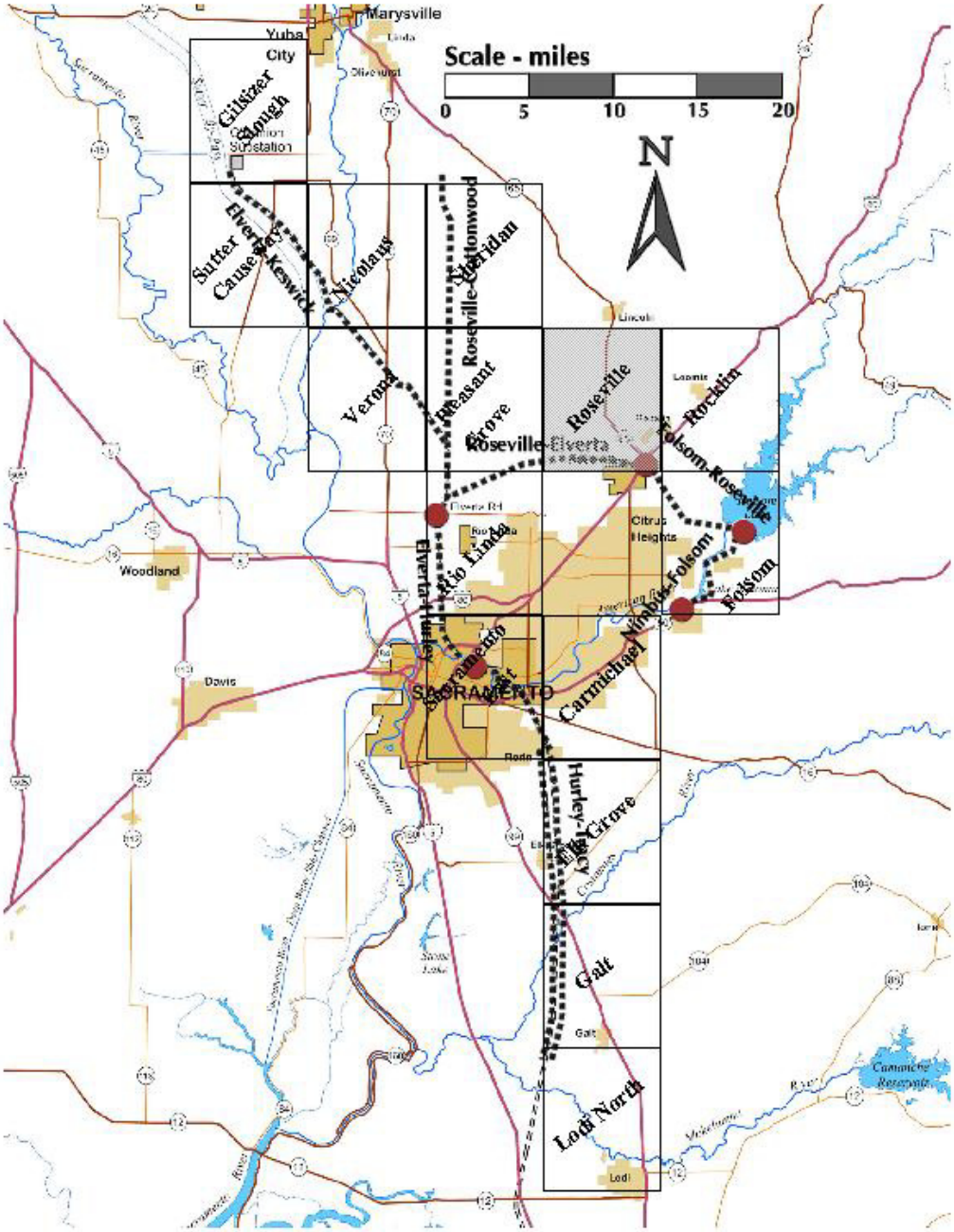
Vernal pools were recorded along the Folsom-Nimbus, Cottonwood-Roseville, Roseville-Elverta, and O'Banion-Elverta lines during the biological survey for the EA. Sacramento Orcutt grass was not observed during this survey and has only been identified in the Folsom USGS quadrangle (Folsom-Nimbus and Folsom-Roseville lines) in the study area (Figure 18-1).

18.3 PROJECT EFFECTS

Vernal pools occur throughout the project area and are likely to be affected in one or more locations. Therefore, the Sacramento Orcutt grass, or its habitat, could be affected by project-related activities in one or more locations.

Impacts on Sacramento Orcutt grass from general vegetation management (regardless of the method used) could include the following:

- Trampling, crushing, or removal of plant species;
- Altering topography, causing a vernal pool to drain;
- Changes in soil moisture, nutrient level, and soil structure due to compaction;
- Increases in turbidity from erosion or rutting by heavy equipment; and
- Increases in noxious weed invasion.



Source: CNDDB 2001

FIGURE 18-1. REPORTED OCCURRENCES OF SACRAMENTO ORCUTT GRASS IN THE STUDY AREA (SHADED QUADRANGLES)

18.3.1 NO-ACTION ALTERNATIVE

Vegetation Maintenance. Under the no-action alternative, vehicles accessing the ROW for manual vegetation maintenance could cause damage to vernal pools, if present, adversely affecting vernal pool species by increasing turbidity, destroying plant and animal species, or altering the topography of the vernal pool. Mechanical methods could be similarly destructive to vernal pools.

Access Road Maintenance. The biological survey did not identify vernal pools along access roads in the study area.

Transmission Line Maintenance. Transmission line patrols and repairs could cause damage to vernal pools and vernal pool species by increasing turbidity, destroying plant and animal species within tire tracks, or altering the topography of the vernal pool.

18.3.2 PROPOSED ACTION

Vegetation Maintenance. Under the proposed action, the short-term (1- to 2-year) effects of establishing low-growth species in the ROW, possibly including removal of particular plant species, could affect vernal pools by vehicle traffic as described under the no-action alternative. Over the long term (greater than 2 years), the proposed action would require less active management, therefore, less vehicle traffic and potential for vehicle damage. In addition, the vegetation would be more stable, reducing the sudden effects that could damage vernal pool habitat. However, additional effects from the proposed action could be caused by herbicides affecting vernal pool vegetation (with likely effects to the invertebrate species) through overspray or runoff.

Access Road Maintenance. The biological survey did not identify vernal pools along access roads in the study area.

Transmission Line Maintenance. Transmission line patrols and repairs could cause damage to vernal pools and vernal pool species by increasing turbidity, destroying plant and animal species within tire tracks, or altering the topography of the vernal pool.

18.4 INTERRELATED AND INTERDEPENDENT ACTIONS AND THEIR EFFECTS

No interrelated or interdependent actions that would affect listed or proposed species have been identified.

18.5 CUMULATIVE EFFECTS

Neither the no-action alternative nor the proposed action would combine with any known State, local, or private actions to result in cumulative impacts.

18.6 AVOIDANCE MEASURES

To avoid adverse effects to Sacramento Orcutt grass, Western would establish buffer zones specific to the type of maintenance activity and season. These buffer zones are listed in Table 4-1.

19.0 SPECIES NOT LIKELY TO BE AFFECTED BY ROW MAINTENANCE ACTIVITIES IN THE STUDY AREA

This chapter provides a summary of Federally listed and State-listed species that were identified in the USFWS list, but that are not likely to occur in any areas that will be affected by the project. This chapter briefly summarizes the status and distribution of each species and gives reasons why these species were not analyzed in more detail.

19.1 CONSERVANCY FAIRY SHRIMP

The conservancy fairy shrimp is a Federal endangered species with disjunct occurrences in Solano, Merced, Tehama, Butte, and Glenn counties. Its habitat is vernal pools and other seasonal freshwater wetlands. There are no known occurrences of the conservancy fairy shrimp in the project area; therefore, it is not likely to be affected by the project.

19.2 DELTA GREEN GROUND BEETLE

The Delta green ground beetle is Federally listed as threatened. The Delta green ground beetle does not occur in the project area and, therefore, would not be affected. The two known population sites for this species are in Solano County, approximately 8 mi south of Dixon (USFWS 1980).

19.3 LAHONTAN CUTTHROAT TROUT

The Lahontan cutthroat trout is a Federal threatened species native to the Lahontan basin of mid-eastern California. Present distribution is restricted to a few lakes and streams within and outside the historic range, including the Truckee, Carson, and Walker river basins and the Yuba, Stanislaus, San Joaquin, and Owens river systems. There are no known occurrences in the project area.

19.4 MOUNTAIN PLOVER

The mountain plover is Federally listed as proposed threatened and is State-listed as a species of special concern. This species does not breed in California; however, it winters from central California south through southern Arizona, central Texas, and north-central Mexico (Cogswell 1977). There are no CNDDB records of mountain plover sightings in the project area. The American and Sacramento rivers are unsuitable nesting and foraging habitats for the mountain plover.

19.5 BALD EAGLE

The bald eagle is Federally listed as threatened and State-listed as an endangered species. The bald eagle is a wintering species in the project area. There are no records of bald eagles nesting in or near the project area.

19.6 TRUCKEE BARBERRY

The Truckee Barberry is known only from the upper banks of the Truckee River in the town of Truckee, Nevada County. This species does not occur in the project area and, therefore, will not be affected.

19.7 ANTIOCH DUNES EVENING PRIMROSE

The Antioch Dunes evening primrose is Federally and State-listed as endangered. This species does not occur in the project area. The nearest known locality is on Brannan Island in the Delta. The Antioch Dunes evening primrose is a perennial herb endemic to the Antioch Dunes, south of the confluence of the Sacramento and San Joaquin rivers. Its historical distribution was not much more extensive than its present distribution in 70 acres of remnant dunes at Antioch.

19.8 HARTWEG'S GOLDEN SUNBURST

The Hartweg's golden sunburst is Federally listed and State-listed as endangered. There are no records for this species in the project area, and the USFWS January 2002 species list indicated that this species might be extirpated from the area. Therefore this species will not be affected by the project.

The Hartweg's golden sunburst is found on the eastern side of Sacramento-San Joaquin valleys and adjacent foothills and historically as far north as Yuba County. This species is found predominantly on northern slopes of rocky, bare areas along rolling hills, shady creeks, adjacent to vernal pools and streams, on heavy clay soils in grasslands, and between 50 and 500 ft.

19.9 SUCCULENT OWL'S CLOVER

The succulent owl's-clover is Federally listed as threatened and State-listed as an endangered species. The succulent owl's-clover is a succulent, hemiparasitic (partly parasitic), annual herb in the figwort family (*Scrophulariaceae*). It has brittle narrow leaves and heads of bright yellow flowers. This species grows in drying vernal pools in valley grassland areas of the San Joaquin Valley at the base of the Sierra Nevada foothills. Its discontinuous distribution extends through northern Fresno, western Madera, eastern Merced, southeastern San Joaquin, and Stanislaus Counties (DFG 2002).

The biological survey did not identify suitable habitat within the Lodi North or Galt quadrangle maps where the USFWS indicates this species might be present (USFWS 2004).

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EXHIBIT A. HABITAT DESCRIPTIONS ALONG TRANSMISSION LINE RIGHTS-OF-WAY

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Table A-1. Habitats Observed Along the Folsom-Nimbus ROW

Survey Reach	Starting Point (south)		Ending Point (north)		Habitat Type and Description
	Road Crossing or Other Descriptive Point	Tower Number	Road Crossing or Other Descriptive Point	Tower Number	
1	Nimbus Substation	0-1	Lake Natoma Trail	1-1	Located near Nimbus Dam on the west side of Lake Natoma, this area is primarily Valley Foothill Riparian. Inlets from Lake Natoma allowed for several Freshwater Emergent Wetlands along this portion of the ROW. Annual grasses, oak and buckeye trees can be found in the adjacent upland areas, west of the ROW. Elderberry shrubs are located throughout the ROW with some showing exit holes from the Valley Elderberry Longhorn Beetle.
2	Lake Natoma Trail	1-1	American River/Lake Natoma West Bank	1-6	Valley Foothill Riparian and associated Freshwater Emergent Wetlands. Several elderberry shrubs along the ROW, some with exit holes. Lacustrine (vernal pools) near Tower 1-3.
3	American River/Lake Natoma West Bank	1-6	American River/Lake Natoma East Bank	1-7	River Crossing. Oaks and Digger pines near Tower 1-6.
4	American River/Lake Natoma East Bank	1-7	American River/Lake Natoma East Bank – Across from Negro Bar State Park	3-6	Valley Foothill Riparian, Riverine and associated Freshwater Emergent Wetlands. Elderberry shrubs, some with exit holes.
5	American River/Lake Natoma East Bank – Across from Negro Bar State Park	3-6	Southern reach of Negro Bar State Park	3-7	River Crossing, Valley Foothill Riparian, Riverine.
6	Southern reach of Negro Bar State Park	3-7	Diversion of Bike Path from ROW – Near Southern Fence of WAPA Property Across from Folsom Prison	4-8	Valley Foothill Riparian, Riverine, Further upland oak-pine woodland.
7	Diversion of Bike Path from ROW – Near Southern Fence of WAPA Property Across from Folsom Prison	4-8	Northern Fence of WAPA Property Across from Folsom Prison	5-6	Valley Foothill Riparian, Riverine, Annual Grassland, Elderberry, some with exit holes.
8	Northern Fence of WAPA Property Across from Folsom Prison	5-6	Folsom Substation	6-5	Annual Grassland, Valley Oak Woodland. Elderberry shrubs, some with exit holes.

Table A-2. Habitats Observed Along the East-West Part of the Cottonwood-Roseville ROW and the Adjacent East-West Portion of the Roseville-Elverta Right of Way

Survey Reach	Starting Point (east)			Ending Point (west)			Habitat Type and Description
	Road Crossing or Other Descriptive Point	CR Twr No.	RE Twr No.	Road Crossing or Other Descriptive Point	CR Twr No	RE Twr No.	
1	Roseville Substation	160-1	0-1	Western End of High Sierra Country Club	158-1	2-1	Primarily an urban area, both residential and commercial (including a cemetery and country club) with annual grassland corridor along the ROW. Occasional drainage ditches provided an opportunity for seasonal emergent wetlands.
2	Western End of High Sierra Country Club	158-1	2-1	Woodcreek Oaks Blvd.	156-5	3-2	Urban residential area with annual grassland and vernal pools.
3	Woodcreek Oaks Blvd.	156-5	3-2	Fiddyment Substation	155-1	5-1	Suburban residential area with open space around ROW. Annual grassland with several vernal pools (mitigation site). Intermittent (Kaseberg) Creek giving rise to seasonal emergent wetland..
4	Fiddyment Substation	155-1	5-1	Start of Fenced Pasturelands on Privately Owned Property	153-1	7-1	Suburban undeveloped area, annual grassland, intermittent creek with associated seasonal wet meadow, Lacustrine (vernal pools).
5	Start of Fenced Pasturelands on pPrivately Owned Property	153-1	7-1	Baseline Rd	151-2	8-4	Pasture, Lacustrine – Vernal Pool
6	Baseline Rd	151-2	8-4	Palladay Rd	150-3	9-4	Croplands-Rice
7	Palladay Rd	150-3	9-4	Colburn Rd	148-5	11-1	Croplands-Field crop other than rice, but currently fallow.
8	Colburn Rd	148-5	11-1	Los Garcias Rd	148-1	11-5 [a]	Annual grassland in rural area characterized by small farms with pastures, scattered Lacustrine-vernal pools.

CR = Cottonwood-Roseville
RE = Roseville-Elverta
ROW = Right-of-way

Table A-3. Habitats Observed Along the North-South Part of the Cottonwood-Roseville ROW and the Adjacent North-South Portion of the O'Banion-Elverta ROW

Survey Reach	Starting Point (south)			Ending Point (north)			Habitat Type and Description
	Road Crossing or Other Descriptive Point	CR Twr. No.	KE Twr. No.	Road Crossing or Other Descriptive Point	CR Twr. No	KE Twr. No.	
1	At Los Garcias Rd.		160-3	At Los Garcias Rd		160-3	Pasture
2	Los Garcias Rd	147-3	160-2	Start of Ranchtek Equestrian Center Pasturelands	147-2	160-1	Croplands – Field Crop Other Than Rice, Annual Grassland
3	Start of Ranchtek Equestrian Center Pasture Lands	147-2	160-1	End of Ranchtek Equestrian Center Pasturelands.	147-1	159-5	Pasture, Annual Grassland
4	End of Ranchtek Equestrian Center Pasturelands.	147-1	159-5	Baseline Rd	146-4	159-3	Urban Residential Area with Annual Grassland Corridor.
5	Baseline Rd	146-4	159-3	First Fence N. of Baseline	146-1	158-4	Croplands – Rice normally, but now fallow.
6	First Fence N. of Baseline	146-1	158-4	KE Line Diverts to NW	144-4	157-4	Croplands – Rice; Nearby drainage canals provide areas where seasonal emergent wetlands/wet meadow can be found.
7	KE Line Diverts to NW	144-4		First Fence North of KE Line Diversion to NW	144-3		Croplands -- Rice
8	First Fence North of KE Line Diversion to NW	144-3		Sankey Rd	144-2		Pasture; Annual Grassland, Overflow from drainage ditches allow for seasonal emergent wetlands/wet meadow.
9	Sankey Rd	144-2		1st Tower N of Sankey Rd	144-1		Annual Grassland; Seasonal Emergent Wetland/Wet Meadow
10	1st Tower N of Sankey Rd	144-1		Curry Creek	143-5		Croplands – Rice; Seasonal Emergent Wetland
11	Curry Creek	143-5		Keys Rd	143-3		Annual Grassland; Lacustrine vernal pools
12	Keys Rd	143-3		Howsley Rd	141-3		Croplands -- mostly rice. Kings Slough crosses the ROW at about Tower 140-2. Seasonal Emergent Wetland/Wet Meadow
13	Howsley Rd	141-3		Catlett Rd	140-1		Croplands -- mostly rice. Pleasant Grove Creek crosses the ROW at about Tower 142-1. Riverine-Valley Foothill Riparian
14	Catlett Rd	140-1		Striplin Rd	138-3		Mostly Croplands (Rice), but some pasture. Auburn Ravine crosses the ROW at one of the pasture towers at 139-1.
15	Striplin Rd	138-3		Marcum Rd	136-3		Mostly Croplands (Rice), but some pasture. Markham Ravine crosses the ROW at about Tower 136-4. Seasonal Emergent Wetland/Wet Meadow

Table A-3. Habitats Observed Along the North-South Part of the Cottonwood-Roseville ROW and the Adjacent North-South Portion of the O'Banion-Elverta ROW

Survey Reach	Starting Point (south)			Ending Point (north)			Habitat Type and Description
	Road Crossing or Other Descriptive Point	CR Twr. No.	KE Twr. No.	Road Crossing or Other Descriptive Point	CR Twr. No	KE Twr. No.	
16	Marcum	136-3		Hicks Rd (PG&E Substation)	134-1		Croplands – Rice. Burkham Slough and Coon Creek cross the ROW between Towers 134-4 and 135-1. Seasonal Emergent Wetland/Wet Meadow and Riverine
17	Hicks Rd (PG&E Substation)	134-1		Kempton Rd	132-3		Croplands – Rice.
18	Kempton Rd	132-3		Gallagher Rd	131-3		Croplands – Rice.
19	Gallagher Rd	131-3		Bear River Drive	130-4		Orchards – Walnut. Yankee Slough crosses the ROW at about Tower 131-1. Seasonal Emergent Wetland/Wet Meadow.
20	Bear River Drive	130-4		Bear River	130-2		Riverine-Valley Foothill Riparian, several elderberry shrubs, some with exit holes; Walnut orchards in remainder of ROW.
21	Bear River	130-2		Sutter/Yuba County Line	129-5		Riverine-Valley Foothill Riparian, several elderberry shrubs, some with exit holes; Walnut orchards in remainder of ROW.

CR = Cottonwood-Roseville
KE = O'Banion-Elverta
ROW = Right-of-way

Table A-4. Habitats Observed Along the O'Banion-Elverta Right of Way to Point Where It Joins the Cottonwood-Roseville ROW

Survey Reach	Starting Point (north)		Ending Point (south)		Habitat Type and Description
	Road Crossing or Other Descriptive Point	Tower Number	Road Crossing or Other Descriptive Point	Tower Number	
1	O'Banion Substation	135/1	Gilsizer Slough	137/1	Cropland—ricefields with associated irrigation ditches and some scattered wetlands. This irrigation ditch contains some dense vegetation along its banks and may provide suitable giant garter snake habitat. In addition, there is a large slough just west of the ROW.
2	Gilsizer Slough north bank	137/1	Gilsizer Slough south bank	137/2	Freshwater emergent wetland
3	Gilsizer Slough south bank	137/2	Where ROW turns east away from levee	144/1	Cropland—ricefields.
4	Where ROW turns east away from levee	144/1	North bank levee of Feather River	146/1	Cropland
5	North Bank levee of Feather River	146/1	South Bank levee of Feather River to the levee	147/1	Valley foothill riparian, riverine, cropland—Riparian habitat on both sides of the river. Tower 146/4 is located within the floodplain in between levees. Cropland north and south of riparian corridor.
6	South Bank levee	147/1	Lee Rd	148/1	Cropland
7	Lee Rd	148/1	Power Line Rd	148/4	Cropland, valley foothill riparian, riverine—Predominantly cropland. Small amount of valley foothill riparian habitat where the ROW crosses Coon Creek.
8	Power Line Rd	148/4	Pleasant Grove Slough/Creek	152/5	Cropland
9	Area immediately surrounding Pleasant Grove Slough/Creek	152/5	Approximately Howsley Rd	153/2	Wetland and valley foothill riparian, riverine—Floodplain
10	Approximately Howsley Rd	153/2	Diversion Point for KE Line Away from North/South CR Line	157/4	Urban, Annual Grassland, and Cropland—cemetery, residential, ricefield, and a small irrigation ditch

CR = Cottonwood-Roseville
KE = O'Banion-Elverta
ROW = Right-of-way

Table A-5. Habitats Observed Along the Folsom-Roseville ROW

Survey Reach	Starting Point (south)		Ending Point (north)		Habitat Type and Description
	Road Crossing or Other Descriptive Point	Tower Number	Road Crossing or Other Descriptive Point	Tower Number	
1	Folsom Substation	0-1	Folsom Dam Road	0-3	Valley oak woodland and grassland. The ROW is part of the Bureau of Reclamation property surrounding Folsom Dam. Some elderberry shrubs.
2	Folsom Dam Road	0-4	Folsom Auburn Blvd	0-4	Valley oak woodland and riparian. The ROW crosses and continues west of a BOR maintenance yard. Some elderberry shrubs.
3	Folsom Auburn Blvd	0-5	E. Roseville Blvd	4-3	Residential. The ROW follows a generally narrow corridor of permanent and trailer park residences. The ROW itself is either grassland or valley oak woodland.
4	E. Roseville Blvd	4-4	Eureka Road	4-4	Park, currently containing construction debris.
5	Eureka Road	4-5	Eureka Road	4-5	Single residence with impassible wetlands on one side
6	Eureka Road	4-6	Taylor Road	6-4	Commercial/Industrial Corridor, including business park office buildings with parking lots, and parking lots for restaurant, bank and theater.
7	Taylor Road	6-4	Roseville Substation	7-1	The ROW crosses multiple traffic lanes at this point, including I-80, and terminates at the Roseville substation. The substation contains both woodland and riparian vegetation.

Source: Field assessment, September 2001 by Tetra Tech NUS
ROW = Right-of- way
CDFG = California Department of Fish and Game

Table A-6. Habitats Observed Along the Elverta-Hurley ROW

Survey Reach	Starting Point (south)		Ending Point (north)		Habitat Type and Description
	Road Crossing or Other Descriptive Point	Tower Number	Road Crossing or Other Descriptive Point	Tower Number	
1	Elverta Substation	0-1	Levee Road	0-5	To the east of Sorento Road/Levee Road, the ROW consists of either grasslands or pasture for grazing
2	Levee Road	0-6	Just N of Del Paso Road	3-3	Pastureland. This is all agricultural land partitioned into numerous small farms along the ROW
3	Just N of Del Paso Road	3-4	Midway betw Del Paso Rd and I-80	4-3	Cropland. This is all agricultural land partitioned into numerous small farms along the ROW
4	Midway betw Del Paso Rd and I-80	4-4	Just S of I-80	5-2	Commercial/Industrial.
5	Just S of I-80	5-3	Just S of I-80	5-3	Cropland.
6	Just S of I-80	5-4	Natomas Ditch	7-4	Residential. The ROW itself is a mixture of grassland, meadow, gardens or, at tower 7-3, a community park.
7	Natomas Ditch	7-5	Camp Pollock	8-1	Boy Scouts of America compound. Just past Natomas Ditch, the ROW turns to the East along the American River Parkway, and the vegetation shifts to riparian.
8	Camp Pollock	8-2	Hurley Substation	11-1	American River Parkway, with predominantly riparian vegetation. Elderberry savanna.

Source: Field assessment, September 2001 by Tetra Tech NUS
ROW = Right-of-way
CDFG = California Department of Fish and Game

Table A-7. Habitats Observed Along the Hurley-Tracy ROW

Survey Reach	Starting Point (south)		Ending Point (north)		Habitat Type and Description
	Road Crossing or Other Descriptive Point	Tower Number**	Road Crossing or Other Descriptive Point	Tower Number**	
1	Hurley Substation	11-1	American River Pkwy just N of Feature Drive	11-4	American River Parkway, with predominantly riparian vegetation.
2	Campus Commons Retirement Community	11-5	Campus Commons Retirement Community	11-5	Residential. The ROW passes through the retirement community's parking lot.
3	Feature Drive just N of Howe Ave and Fair Oaks Blvd	12-1	Scripps Drive	12-6	Commercial/Industrial. The ROW passes through parking lots of an office building, an auto body shop, a health club, and a grocery store.
4	Scripps Drive	12-6	Folsom Blvd.	14-4	Residential. Predominantly city park areas, but includes as well passage through an apartment complex and elementary school parking lot.
5	Folsom Blvd.	14-4	Just S of Fruitridge Road	17-1	Commercial/Industrial. The more significant surroundings and habitat include a landfill and quarry.
6	Just S of Fruitridge Road	17-1	Bond Road	24-1	Agricultural lands. This is primarily pastureland but also includes land used for fieldcrops, truck gardens and a nursery. It also passes through Churchill Downs Community Park at towers 21-2 and 21-3.
7	Bond Road	24-1	Just S of Elk Grove Blvd	25-3	Residential. This is a narrow grassland corridor with residences on the east and Watermen Rd directly adjoining on the west
8	Just S of Elk Grove Blvd	25-3	Just S of Grant Line Rd near the SMUD substation	27-3	Predominantly pastureland. These are agricultural-use backyards to the many farm residences along this stretch.
9	Near the SMUD substation	27-4	Near the SMUD substation	27-4	Commercial/Industrial. Grassland vegetation.
10	Just N of Hwy 99	27-5	Hwy 99	27-6	Golf course and surrounding tumbleweed fields.
11	Just S of Hwy 99	28-1	Cosumnes River N Levee.	29-4	Agricultural lands. These lands are a mixture of pasture, vineyard and poultry farming lands, with Tower 29-4 situated at the top of a levee.
12	Cosumnes River N Levee	29-4	Badger Creek	30-4	With the exception of a narrow strip of riparian vegetation around the Cosumnes River, the ROW along this stretch is grassland, and with the exception the lands to the east near the river that are agricultural, these grasslands are surrounded by grasslands as well.
13	Badger Creek	30-4	Twin Cities Road	33-1	Grasslands. This span is a nature preserve that is bisected by Laguna Creek.
14	Twin Cities Road	33-1	Just N of another tributary of the Cosumnes River	34-3	Agriculture lands. All but the lands around tower 34-1 are given to the raising of fieldcrops.

Table A-7. Habitats Observed Along the Hurley-Tracy ROW

Survey Reach	Starting Point (south)		Ending Point (north)		Habitat Type and Description
	Road Crossing or Other Descriptive Point	Tower Number**	Road Crossing or Other Descriptive Point	Tower Number**	
15	Just N of another tributary of the Cosumnes River	34-4	Orr Road	35-1	Grasslands. These former agricultural lands were recently acquired for use as a nature preserve.
16	Orr Road	35-2	Dry Creek (San Joaquin County Line)	37-1	Agricultural lands, including vineyards, cattle pasture and cropland.

Source: Field assessment, September 2001 by Tetra Tech NUS
ROW = Right-of-way
CDFG = California Department of Fish and Game
** Starting at tower 18-1, the Hurley-Tracy Line splits into two transmission lines, with adjoining ROWs. Towers with basically identical tower numbers such as 24-3E and 24-3W are slightly offset east to west.