10/28/07 rec'd

FINAL

REVISED BIOLOGICAL ASSESSMENT

Application for Certification (06-AFC-9) for COLUSA GENERATING STATION Colusa County, California

October 2007

Prepared for:
E&L Westcoast, LLC

Prepared by:
URS

URS

October 19, 2007

Ms. Michelle Tovar
Fish and Wildlife Biologist
U.S. Fish & Wildlife Service
Endangered Species Division-Sacramento Valley Branch
2800 Cottage Way, Suite W2605
Sacramento, California 95825-3901

Re: Colusa Generating Station Project – Final Biological Assessment

Dear Ms. Tovar:

On behalf of E&L Westcoast, LLC, URS has prepared revisions to the Colusa Generating Station Biological Assessment (BA), which was submitted to the U.S. Fish and Wildlife Service (USFWS) on December 18, 2006. The revised BA incorporates supplemental information transmitted to your office in letter format in August 2007 and additional information that was requested at the interagency meeting on September 25, 2007. The following information has been added or updated in the revised BA:

- Updated project description (Sections 1.1.1 through 1.1.3)
  - Updated information on the designs of the bridge replacements at Glenn-Colusa Canal and Teresa Creek
  - New table that summarizes how the construction schedule would be timed to avoid and/or minimize disturbance to federally listed species (Table 2).
- Added supplemental information that was submitted via letter in August 2007 has been integrated throughout the document. The original transmittal is included in Appendix B.
- Added a new figure that indicates the locations of permanent and temporary impacts to giant garter snake (GGS) aquatic habitat and vernal pool branchiopod habitat (Figure 3; Figure 4, View 1)); impact acreages are cross-referenced to habitat types in Tables 8 and 9.

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612-1924
Tel: 510.893-3600
Fax: 510.874.3268
www.urscorp.com

site. This species was not included in the results of an updated search of the USFWS online database in October 2007.

The following sections of the BA have also been updated:

- Summary of Agency Consultation to Date (Section 1.1.6)
  - Summarized coordination with the California Energy Commission (CEC), U.S. Army Corps of Engineers (ACOE), USFWS, National Marine Fisheries Service (NMFS), and California Department of Fish and Game (CDFG).
  - Included NMFS letter to the ACOE dated August 2, 2007. The NMFS concluded that the proposed action is not likely to adversely affect listed fish species under NMFS jurisdiction including Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*), Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*), Central Valley steelhead (*Oncorhynchus mykiss*), and the Southern Distinct Population Segment of the North American green sturgeon. NMFS determined that adverse impacts to federally listed salmonids will be avoided due to listed salmonids and designated critical habitat not being present in the project area. NMFS also confirmed that the project would not affect any Essential Fish Habitat. Potential impacts and mitigation to federally listed fish species under NMFS jurisdiction have been removed from the Revised BA.
- Pre-Survey Investigations (Section 2.1)
  - Updated the USFWS species list and CNDDB occurrence search
- Biological Resources Surveys (Section 2.2)
  - Preliminary California tiger salamander habitat assessment surveys and additional wetland delineation and vernal pool mapping conducted in 2007 are included in text and in Table 7.
- Vegetation Communities and Wildlife Habitats (Section 3.1)
  - Description of seasonal wetlands and freshwater marsh wetlands in project site expanded.
- Electrocution Hazard (Section 4.2.3.2)
  - Per the CEC's requirement, text was added to state that the transmission lines would be designed and built in accordance with the *Avian Power Line Interaction*

Committee's Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006.

- Branchiopods (4.3.2)
  - Included mitigation measures provided in the supplemental letter to the BA transmitted to your office on August 24, 2007.
- California Tiger Salamander (4.3.3)
  - Included mitigation measures provided in the supplemental letter to the BA transmitted to your office on August 24, 2007.

Please contact Steve Leach at 510.874.3205 or Melissa Newman at 510.874.1747 if you have any questions regarding this submittal. We are available to discuss this submittal at your earliest convenience.

Sincerely,
URS CORPORATION

Steve Leach
Senior Biologist

Enclosure

cc: Andrew Welch, E&L Westcoast
Dale Shileikis, URS
Brian Vierria, Corps
Rosie Bjornsen, CDFG
Rick York, CEC
Misa Ward, CEC
Shahera Kelley, EPA
Kim McCormick

SUMMARY

This Biological Assessment provides technical information and reviews the proposed E&L Westcoast, LLC (E&L Westcoast) Colusa Generating Station (CGS) project in sufficient detail to determine to what extent the proposed project may affect threatened, endangered, or proposed species. The Biological Assessment is prepared in accordance with legal requirements found in Section 7 (a)(2) of the Endangered Species Act (16 U.S.C. 1536(c)) and with U.S. Environmental Protection Agency (U.S. EPA) regulation, policy, and guidance.

This document also provides information required for Essential Fish Habitat (EFH) Consultation with the National Marine Fisheries Service (NMFS). Under Section 305(b)(4) of the Magnuson-Stevens Act, NMFS is required to provide advisory EFH conservation and enhancement recommendations to federal and state actions that adversely affect EFH.

Proposed Action

E&L Westcoast proposes to construct and commission a nominal 660-megawatt (MW) combined cycle power plant on 31 acres of a 100-acre site leased by E&L Westcoast adjacent to Delevan Road in Colusa County, California. The proposed project is approximately 4 miles west of Interstate 5 (I-5), 14 miles north of the farming community of Williams, and 72 miles north of Sacramento (Figure 1). The power plant site is within the Holthouse Ranch and is located within the eastern half of Section 35, Township 18 North, Range 4 West, Mount Diablo Base and Meridian. The power plant site consists of 100 acres of a 451-acre parcel (Assessor's Parcel Number (APN) 11-040-024, Colusa County). The power plant is located adjacent to Delevan Road in Colusa County, California (Figure 2).

The project would include a 22.5-acre power generation facility and stormwater detention basin, a 8.2-acre switchyard, a 43-acre construction area (including laydown, parking, and office), a 1,800-foot-long electrical interconnection to Pacific Gas & Electric's (PG&E's) existing transmission lines, a 1,500-foot-long natural gas pipeline connecting to PG&E's existing natural gas lines, a 2,700-foot-long water supply pipeline from the Tehama-Colusa Canal, and a 2,500-foot-long access road extending from the existing road leading to the PG&E Compressor Station. In addition, a permanent 12-foot-wide dirt road would be constructed along the pipeline conveying water from the Tehama-Colusa Canal to the power plant (Figure 2). The road would be used for maintenance and access to the water intake at the Tehama-Colusa Canal.

To allow for transportation of some of the heavier equipment components to the site, the following two bridges would be replaced: (1) a bridge on Dirks Road over the Glenn-Colusa Canal (Figure 3), and (2) a bridge on McDermott Road over Teresa Creek (Figure 4, View 1). In addition, the eastern side of the Delevan/McDermott intersection would be slightly widened (Figure 4, View 2). After construction is completed, local access roads would be repaved or resurfaced as necessary and appropriate.

Potential Effects to Listed Species

The following listed plant species have the potential to occur in the vicinity of the proposed project site based on the proximity of known occurrences and the historic range of the species:

- Hoover's spurge – Threatened
- Hairy Orcutt grass – Endangered
- Greene's tuctoria – Endangered
- Palmate-bracted bird's beak – Endangered

The following listed animal species have the potential to occur in the vicinity of the proposed project site based on the proximity of known occurrences and the historic range of the species:

- Northern spotted owl – Threatened
- Giant garter snake – Threatened
- Delta smelt – Threatened
- Chinook salmon (The Central Valley Spring Run ESU [T], Central Valley Fall/Late-Fall Run ESU [C], The Sacramento Valley Winter Run ESU [E])
- Central Valley steelhead – Threatened
- Listed branchiopods (Conservancy fairy shrimp [E], Vernal pool fairy shrimp [T], and Vernal pool tadpole shrimp [E])
- Valley elderberry longhorn beetle – Threatened
- Least Bell's vireo – Endangered
- Western yellow-billed cuckoo – Candidate
- California tiger salamander – Threatened
- California red-legged frog – Threatened

Focused surveys and habitat assessments were conducted to evaluate whether any of the listed species are likely to utilize habitats in the project site and the vicinity. Based on this evaluation, the following species could be adversely affected by the proposed project:

- Giant garter snake
- Listed branchiopods (Conservancy fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp)

The following species are not likely to be adversely affected by the proposed project based on the habitat evaluation, agency consultation, and the proposed implementation of measures to avoid and minimize effects on sensitive biological resources:

- Northern spotted owl
- Delta smelt
- Chinook salmon (Central Valley Spring Run ESU and Sacramento Valley Winter Run ESU)
- Central Valley Steelhead Distinct Population Segment
- Valley elderberry longhorn beetle
- Least Bell's vireo
- Western yellow-billed cuckoo
- California tiger salamander
- California red-legged frog

TABLE OF CONTENTS

Page

TABLES

FIGURES

APPENDICES

ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
ACC	air-cooled condenser
AFC	Application for Certification
APN	Assessor's Parcel Number
CDFG	California Department of Fish and Game
CEC	California Energy Commission
CGS	Colusa Generating Station
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
COTP	California-Oregon Transmission Project
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
GCID	Glenn-Colusa Irrigation District
gpm	gallons per minute
I-5	Interstate 5
kV	kilovolts
LORS	Laws, ordinances, regulations, and standards
MW	megawatts
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NO_x	nitrogen oxides
PG&E	Pacific Gas and Electric
PM_{10}	inhalable particulates
PSA	Preliminary Staff Assessment
PSD	prevention of significant deterioration
SO_2	sulfur dioxide
TCCA	Tehama-Colusa Canal Authority
U.S. EPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1.0 INTRODUCTION

The purpose of this Biological Assessment is to provide technical information and to review the proposed E&L Westcoast, LLC (E&L Westcoast) Colusa Generating Station (CGS) project in sufficient detail to determine to what extent the proposed project may affect federal threatened, endangered, or proposed species. The Biological Assessment is prepared in accordance with legal requirements found in Section 7 (a)(2) of the Endangered Species Act (16 U.S.C. 1536(c)) and with U.S. Environmental Protection Agency (U.S. EPA) regulation, policy, and guidance.

This Biological Assessment is organized into five chapters. Chapter 1 describes the proposed action. Chapter 2 describes the methods. Chapter 3 describes the existing conditions, including the vegetation communities, wildlife habitats, special status plants, and wildlife species. Chapter 4 describes the potential effects of the proposed action on listed, proposed, and candidate species as well as measures that are proposed to avoid, minimize, and compensate for potential impacts. References cited in the Biological Assessment are provided in Chapter 5.

This document also provides information required for Essential Fish Habitat (EFH) Consultation with the National Marine Fisheries Service (NMFS). Under Section 305(b)(4) of the Magnuson-Stevens Act, NMFS is required to provide advisory EFH conservation and enhancement recommendations to federal and state actions that adversely affect EFH.

The proposed project is currently under review for certification by the California Energy Commission (CEC). E&L Westcoast submitted an Application for Certification (AFC) to the CEC on November 6, 2006. The AFC was deemed Data Adequate by the CEC for the 12-month process on December 13, 2006. The CEC Preliminary Staff Assessment (PSA) was published on July 31, 2007.

1.1 DESCRIPTION OF THE PROPOSED ACTION

1.1.1 Introduction

E&L Westcoast proposes to construct and commission a nominal 660-megawatt (MW) combined cycle power plant on 31 acres of a 100-acre site leased by E&L Westcoast. Under a contract executed earlier this year, E&L Westcoast would then transfer ownership and operation of the power plant to Pacific Gas and Electric (PG&E) after completion of commissioning.

The power plant site is located adjacent to Delevan Road in Colusa County, California (Figure 1). The site is situated approximately 4 miles west of Interstate 5 (I-5), 14 miles north of the farming community of Williams, and 72 miles north of Sacramento (Figure 1). The power plant site is within the Holthouse Ranch and is found within the eastern half of Section 35, Township 18 North, Range 4 West, Mount Diablo Base and Meridian. The power plant site consists of 100 acres of a 451-acre parcel (Assessor's Parcel Number (APN) 11-040-024, Colusa County).

The project would include a 22.5-acre power generation facility and stormwater detention basin, a 8.2-acre switchyard, a 43-acre construction area (including laydown, parking, and office), a 1,800-foot-long electrical interconnection to PG&E's existing transmission lines, a 1,500-foot-long natural gas pipeline connecting to PG&E's existing natural gas lines, a 2,700-foot-long water supply pipeline from the Tehama-Colusa Canal, and a 2,500-foot-long access road extending from the existing road leading to the PG&E Compressor Station. In addition, a permanent 12-foot-wide dirt road would be constructed along the pipeline conveying water from the Tehama-Colusa Canal to the power plant (Figure 2). The road would be used for maintenance and access to the water intake at the Tehama-Colusa Canal.

To allow for transportation of some of the heavier equipment components to the site, the following two bridges would be replaced: (1) a bridge on Dirks Road over the Glenn-Colusa Canal (Figure 3), and (2) a

bridge on McDermott Road over Teresa Creek (Figure 3, View 1). In addition, the eastern side of the Delevan/ McDermott Road intersection would be slightly widened (Figure 4, View 2). After construction is completed, local access roads would be repaved or resurfaced as necessary and appropriate.

Teresa Creek Bridge. The existing Teresa Creek Bridge is an older structure with a wood deck. The new Teresa Creek Bridge would be approximately 75 feet in length with no piers or abutments in waters of the United States. To accommodate local traffic during construction of the new bridge, a temporary 14-foot-wide culvert crossing and detour road would be installed immediately downstream of the existing bridge prior to construction of the new bridge. Construction of the new Teresa Creek Bridge would be divided into three components, as generally described below.

1. **Temporary Bypass.** Construction of the new bridge would occur during the dry season. Temporary culverts would be placed in the stream channel to convey the expected flows in Teresa Creek while the detour route is in place. The temporary culvert is expected to be 16 feet wide and 11 feet high. These dimensions would be confirmed during final design. The applicant would coordinate construction activities with Colusa County and the Glenn-Colusa Irrigation District to determine the anticipated flow rate of discharges into Teresa Creek during the construction period.

   The pipe culverts would be laid on gravel placed on the creek bed, and would be overlain with gravel and backfill to form a roadway embankment placed over the culverts, and a road graded and possibly paved (depending on the average daily traffic count) for the passage of traffic. Construction of the temporary culvert crossing would temporarily fill approximately 0.040 acre of the perennial stream. Approximately 0.023 acre of seasonal wetland vegetation between the existing bridge and the temporary crossing would be disturbed during construction (Figure 4, View 1).

2. **Bridge Removal.** Bridge demolition equipment would be needed to remove the existing structure. The timber superstructure would be removed with a small crane, tractor, and truck. Abutments would be demolished using concrete demolition equipment. The use of sheet piling or cofferdams could be considered during the final design process, to limit work within flowing water during bridge demolition. All existing bridge structure and materials would be removed from the site and disposed in an approved landfill. It is not known whether the existing bridge abutment is on piles. If piles are present, the top 2 feet would be removed in accordance with the Caltrans Standard Specifications.

3. **Permanent Structure.** The permanent replacement bridge would be constructed after the temporary bridge is installed and operational. The permanent structure would meet all applicable design standards for conveying expected flows to avoid changes in stream depth and flow rates in the project area. Culvert or abutment walls would use wood forms to accommodate cast-in-place construction. Wingwalls at the upstream and downstream sides of the structure would be constructed to prevent scouring of the bridge abutments.

   The wingwall on the northwest side of the bridge abutment would be constructed to prevent erosion of the bank where two drainage culverts discharge into Teresa Creek (Figure 4, View 1). Water draining from the culverts has eroded a wide section of bank below the outfall. The culverts would extend through the wingwall and the stream bank behind the wall, which has been eroded, would be backfilled. The retaining wall, construction, and backfill would result in the permanent fill of approximately 0.014 acre of the perennial stream.

   After the permanent bridge has been constructed, the temporary stream crossing would be removed and all disturbed areas would be returned to pre-project conditions. During construction, adequate flows allowing for fish passage would be maintained at all times. The

culverts installed for the temporary bridge would be large enough so as not to restrict peak expected flows. If dewatering of some areas is required during construction, a qualified biologist would be present during dewatering to ensure that fish are not injured. Fish that may be trapped behind the cofferdam would be netted and removed from the dewatering area. Additionally, a net or some other type of fish screen would be used on the end of the dewatering pump, to prevent any fish from being sucked into the pumping mechanism, providing the biologist with adequate opportunity to remove the fish from the area. All disturbed areas would be revegetated with native species, including disturbed areas adjacent to the active channel.

Glenn-Colusa Canal Bridge. The existing Glenn-Colusa Canal Bridge located at the end of Dirks Road was built in 1965 to provide access to, and support the construction of, the PG&E Delevan Gas Compressor Station. This bridge is a four-span concrete-decked structure that is 74 feet long by 20 feet wide. The bridge provides weight-limited one-way truck traffic and speed-limited two-way automobile traffic (due to the reduced lane width of 8 feet) with 2-foot shoulders. The bridge was originally designed for a 40-ton load, but is currently rated H-20, a 20-ton load, by the American Association of State Highway and Transportation Officials (AASHTO).

A new Glenn-Colusa Canal Bridge is necessary because the heaviest equipment for the plant would exceed the HS-20 rating of the existing bridge. The new bridge cannot be constructed in the same location because the existing bridge would be required as site access for initial construction mobilization while the new bridge is being installed.

The new Glenn-Colusa Canal Bridge would be approximately 100 feet long by 30 feet wide and would be a three-span bridge (Figure 3). The east approach would be located approximately 75 feet south of the existing bridge, and the west approach would be located about 45 feet south. This would provide for two 12-foot lanes with 3-foot shoulders, giving unimpeded two-way traffic flow. The bridge deck would be replaced in time to accommodate the heavy haul equipment entering the site. The bridge would be fitted with side guard rails and would be striped to permit safe passage of traffic.

The replacement design includes a 1.09-acre temporary construction staging and parking area on the east side of the Glenn-Colusa Canal as well as an approximately 135-foot construction right-of-way along the alignment (Figure 3). The access road on both sides of the bridge would be realigned to straighten and widen the approaches to allow for unimpeded two-way traffic, re-aligning with the current Dirks Road right-of-way as soon as practical. A retainer wall would be placed along the northern side of Dirks Road, on the east side of the replacement bridge, to enable the continued use of the current irrigation canal. Two rows of five driven piers would be constructed in the canal to support the bridge (the total permanent impact would be 0.029 acre). A cofferdam of corrugated steel sheet piles would be installed so that the work area for each bridge abutment can be dewatered. The cofferdams would be placed as close as possible to the abutment construction area to minimize the impact to the flow of the canal (Figure 3). If necessary only one cofferdam would be installed at a time. The inside of the cofferdam would be dewatered using pump(s) and the water would be released back into the canal downstream of the cofferdam. The two cofferdams would dewater approximately 0.009 and 0.011 acre of canal. The bridge piers would be driven pre-cast concrete or drilled cast in place concrete, installed by equipment located on the canal embankment and can be installed even during high water levels without the use of cofferdams around the pier locations.

The existing bridge would be removed after the new bridge is constructed. The concrete deck and the three sets of five piers associated with the existing bridge would be removed. The piers would be cut off at the mud line and removed during low or empty water conditions, which would allow the work to be done without placing heavy equipment into the canal. A temporary 2- to 4-foot-high preformed plastic cofferdam placed around each set of five piers one set at a time (Figure 3), would be anchored to the canal bed using stakes or other temporary attachment methods with the necessary dewater being released back to the canal. Since this would be done during low or no water conditions there would be no impact to

canal operations. The approximate area to be temporarily dewatered by the cofferdams is 0.012 acre. Removal of the existing bridge piers would offset potential impacts of the new piers on the flow of water in the canal. The two bridge abutments supporting the existing bridge would be left in place to eliminate construction impacts to the canal embankments. This would not affect the operation of the canal. The original bridge approaches would be final-graded to match the surrounding land contours and seeded with grass native to the region.

Upon completion of the bridge replacement, the road approaches would be final-graded to match the surrounding land contours and seeded with grass native to the region. All disturbed areas would be returned to pre-project conditions after construction is complete.

Delevan and Mc Dermott Road Improvement. To accommodate the wide-turning radius of some heavy-haul trucks, the northeastern and southeastern corners of the intersection of Delevan Road and McDermott Road would be widened by grading and placement of gravel around these corners. Grading would occur up to the area between the existing pavement and the concrete abutment to the irrigation canal. No modifications of the irrigation canal are proposed. Grading would require relocation of the stop sign and telephone conduit box at the northeastern corner of the intersection.

1.1.2 Construction, Access and Staging Areas

Construction of the proposed project would temporarily disturb 95.82 acres. Approximately 35.1 acres would be used for permanent operation (Table 1). Mobile trailers would be used as construction offices for contractor and subcontractor personnel. Construction laydown areas would extend beyond the 100-acre site boundary as shown in Figure 2. A separate sublease would be used as part of the agreement with the property owner to secure the additional area required for construction laydown. The proposed site would be accessed by a new 30-foot-wide, approximately 2,500-foot-long road extending from an existing PG&E Road Easement (Figure 2). Temporary construction fencing would be installed along both edges of the existing PG&E access road during construction to prevent construction vehicles from intruding into adjacent environmentally sensitive habitat. The best achievable control measure for fugitive dust would be employed during construction. A 17-point dust suppression program has been proposed as part of the AFC.

1.1.3 Schedule

Construction of the project is scheduled to occur over 24 months, beginning in early 2008. The project, including offsite infrastructure as well as startup and commissioning, would be completed and would begin commercial operation by the spring of 2010. Construction activities would be scheduled to avoid or minimize disturbance to special-status species (see mitigation measures for more information). Table 2 shows the time periods when work would be conducted at specific locations to minimize adverse effects to federally listed species.

1.1.4 Special-Status Species List

This Biological Assessment evaluates the potential project-related effects on plant and animal species that are listed, proposed for listing, or candidates for listing under the federal Endangered Species Act.

Federal threatened, endangered, proposed threatened, proposed endangered, and candidate species that may occur in the vicinity of the project site are listed in Table 3. The U.S. Fish and Wildlife Service (USFWS) species list for the project site's USGS 7.5-minute quadrangle (Maxwell), the eight 7.5-minute quadrangle surrounding the project site (Sites, Logandale, Colusa, Manor Slough, Williams, Moulton Weir, Princeton, and Logan Ridge), and two additional 7.5-minute quadrangles located farther north and south of the project site (Willows and Cortina Creek) is included in Appendix A.

1.1.5 Critical Habitat

The proposed project is not located within designated critical habitat for any federally listed species.

1.1.6 Summary of Consultation to Date

1.1.6.1 Previous Proposed Colusa Generating Station Project

A Biological Assessment for a power plant at the same project location was submitted to the U.S. Fish and Wildlife Service (USFWS) on October 8, 2001. Informal consultation with USFWS biologist Ken Fuller was conducted beginning in August 2001 and continued until the proponent, Reliant Energy, withdrew the project in 2002. A letter summarizing the USFWS's comments on the October 8, 2001 Biological Assessment is dated November 20, 2001 (USFWS File #1-1-02-TA-0242). Mr. Fuller attended a site visit on August 1, 2001 and the Data Response and Issue Resolution Workshop that was held in Colusa on September 26, 2001.

1.1.6.2 Current Proposed Colusa Generating Station Project

1.1.6.2.1 California Energy Commission

An AFC for the current Colusa Generating Station project was submitted to the California Energy Commission on November 6, 2006. The CEC deemed the AFC Data Adequate on December 13, 2006 for the 12-month process. An issues-resolution public workshop on the project was held on February 21, 2007. The CEC Preliminary Staff Assessment was published on July 31, 2007. Information regarding a change to the proposed Glenn-Colusa Bridge replacement was transmitted to the CEC on August, 17, 2007 in a document that included comments on the CEC PSA. A PSA public workshop was held on August 22, 2007.

1.1.6.2.2 U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (ACOE) is the federal nexus for formal consultation with the USFWS under section 7 of the Endangered Species Act. Two inter-agency meetings have been held at the Sacramento office of the ACOE; one meeting on January 11, 2007 and the other on September 25, 2007. The Jurisdictional Delineation report and Individual Standard Permit Application were submitted to the ACOE on April 5, 2007. Additional information requested by the ACOE was transmitted in a letter on May 24, 2007. The ACOE initiated consultation with USFWS and the National Marine Fisheries Service on June 13, 2007. The Jurisdictional Delineation was verified by the ACOE on August 10, 2007. An update to the ACOE permit application was submitted in a letter to the ACOE on August 28, 2007.

1.1.6.2.3 U.S. Fish and Wildlife Service

A draft Biological Assessment was submitted to the USFWS on December 18, 2006. Supplemental information to the December 2006 Biological Assessment was submitted to the USFWS in letter format on August 24, 2007 (Appendix B). USFWS biologist Michelle Tovar attended the inter-agency meetings in January and September 2007.

1.1.6.2.4 National Marine Fisheries Service

NMFS responded to the ACOE June 13, 2007 request for consultation, in a letter dated August 2, 2007. NMFS concurred with ACOE that the project is not likely to adversely affect listed fish species under NMFS jurisdiction, including Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*), Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*), Central Valley steelhead (*Oncorhynchus mykiss*), and the Southern Distinct Population Segment (DPS) of the North American green sturgeon (*Acipenser medirostris*). NMFS determined that adverse impacts to federally

listed salmonids will be avoided because listed salmonids and designated critical habitat are not present in the project area. NMFS also confirmed that the project would not affect any Essential Fish Habitat.

1.1.6.2.5 California Department of Fish and Game

A Streambed Alteration Agreement application was transmitted to the California Department of Fish and Game (CDFG) on October 12, 2007.

1.1.7 Document Preparation History

A previous version of this Biological Assessment was submitted to the USFWS on October 8, 2001 for a power plant project at the same location. The previous draft of this Biological Assessment for the current Colusa Generating Station project was submitted to USFWS on December 18, 2006. This version of the Biological Assessment has been updated to address the project currently proposed by E&L Westcoast. This document was prepared with input from the following URS biologists:

Steve Leach, Senior Biologist, URS Corporation
1333 Broadway Avenue, Suite 800
Oakland, CA 94612-3268
Office (510) 874-3205
Email Steve_Leach@urscorp.com

Melissa Newman, Staff Biologist, URS Corporation
1333 Broadway Avenue, Suite 800
Oakland, CA 94612-3268
Office (510) 874-1747
Email Melissa_Newman@urscorp.com

1.2 APPLICANT INFORMATION

Project: Colusa Generating Station

Location: Colusa County, California

USGS Quadrangle: Township 18 North, Range 4 West, Section 35
USGS Colusa, Manor Slough, Williams, Moulton Weir, Princeton, Willows, Cortina Creek, Logan Ridge, Logandale, Maxwell, and Sites

Contact Person: Andrew Welch, E&L Westcoast, LLC.
8403 Colesville, Suite 915
Silver Springs, Maryland 20910
Office (240) 723-2304

Contact Person: Steve Leach, Senior Biologist, URS Corporation
1333 Broadway Avenue, Suite 800
Oakland, CA 94612-1924
Office (510) 874-3205

2.0 METHODS

This section describes the methods used to evaluate potential impacts to listed, proposed, and candidate species and their habitats in the Colusa Generating Station project site. The "project site," which is the footprint of the Colusa Generating Station project, includes permanently and temporarily disturbed areas created by the construction of the following:

- Power generation facility and stormwater detention basin
- Switchyard
- Construction area (including laydown, parking, and office)
- Transmission line interconnection to existing PG&E transmission lines
- Natural gas pipeline connection to existing PG&E natural gas lines
- Water supply pipeline from the Tehama-Colusa Canal and associated intake
- Access road extending from the existing road leading to the PG&E Compressor Station
- Replacement of the Glenn-Colusa Canal Bridge and Teresa Creek Bridge
- Widening of the Delevan/McDermott Road intersection

The "project area/vicinity" refers to the general region surrounding the project site. "Biological study area," per the AFC guidelines, refers to the one-mile radius around the project site and the 1,000-foot area adjacent to linear features.

The study included a review of historical information, habitat characterization and mapping, focused surveys for special-status plant and wildlife species, and delineation of wetlands.

2.1 PRE-SURVEY INVESTIGATIONS

URS biologists reviewed relevant literature, previous technical reports, California Natural Diversity Database (CNDDB) and California Native Plant Society (CNPS) records, and a species list for the Colusa, Manor Slough, Williams, Moulton Weir, Princeton, Willows, Cortina Creek, Logan Ridge, Logandale, Sites and Maxwell USGS quadrangles provided by the USFWS to identify species with potential to occur in the vicinity of the project site (Appendix A).

2.2 BIOLOGICAL RESOURCE SURVEYS

All biological resource surveys are listed in Table 4. The entire study area was surveyed for special-status plants on March 26 and 27, April 23, May 11, and July 26, 2001. Uplands were surveyed April 23, 2001. Vernal pool and alkali grassland habitat were surveyed for rare plants on July 26, 2001. URS conducted additional plant surveys of the project site and vicinity on April 5, August 24, September 22, and October 10, 2006, and March 9 and 14, 2007. Special-status plant surveys were timed to occur during the proper phenological stage (e.g., peak flowering times) for identification of the targeted plant species. Portions of the study area in active cultivation were excluded from focused surveys for special-status plants. All undeveloped portions of the study were surveyed on foot. Walking surveys were conducted for natural areas by teams of two or more field investigators under the supervision of a senior URS biologist. Plant species observed in the project area are listed in Tables 5 and 6. Although habitats suitable for federally listed plants are present at the project site, no federal status plant species were observed in the project site or immediate vicinity during field surveys conducted in 2001 and 2006.

In addition to surveys conducted for the proposed power plants, Essex Environmental Consulting conducted field surveys for special-status plant species in 2001 as part of the environmental review for the Wild Goose Storage Expansion project (MHA Environmental Consulting, 2002). A portion of the area surveyed for the Wild Goose Storage Expansion overlaps with the project site of the proposed project.

No federal-status plant species were observed during focused surveys for the Wild Goose Storage Expansion project.

The entire study area was walked to identify occurrences of special-status wildlife species or their habitats on March 9, 26, and 27 in 2001 and August 24, 2006. Field personnel recorded all sighting of foraging raptors and raptor nests within 1 mile of the project area. Binoculars and spotting scopes were used to aid in bird identification. All seasonally ponded habitats in the survey area were mapped and characterized. Focused presence/absence surveys for vernal pool fairy shrimp and vernal pool tadpole shrimp were not conducted because presence was assumed based on known occurrences in the study area. Wildlife species observed in the project area are listed in Table 7.

At the request of the USFWS and ACOE, additional site visits were conducted March 9 and 14, 2007 to evaluate the alkali grassland habitats in the project vicinity, re-evaluate the vernal pool habitat in the project area for suitability for vernal pool branchiopods, and update the vernal pool mapping in the project vicinity. The results of these surveys are discussed in the supplemental letter to the Biological Assessment that was transmitted to the USFWS on August 24, 2007 (Appendix B).

At the request of USFWS, a preliminary habitat assessment survey for the California tiger salamander (CTS) (*Ambystoma californiense*) was conducted in the project site and vicinity on March 21 and April 19, 2007. URS biologists evaluated the hydrology of seasonally ponded sites throughout the project vicinity to determine whether these sites may be inundated long enough for CTS to successfully breed. The assessment also included a review of the available CTS literature, historic CTS observations/surveys in Colusa County and neighboring counties, and conversations with Mark Jennings, a noted CTS biologist who is familiar with the nearest occurrences in Yolo County. The results of the preliminary assessment are discussed in the supplemental letter to the Biological Assessment that was transmitted to the USFWS on August 24, 2007 (Appendix B).

3.0 EXISTING CONDITIONS

3.1 VEGETATION COMMUNITIES AND WILDLIFE HABITATS

The proposed power plant site is located in an unincorporated area of Colusa County that is designated for general agricultural use. The site is part of an existing 4,800-acre ranch that has been used historically for cattle grazing and dryland grain production. The ranch has been owned by the Holthouse family for approximately 25 years. At present, the majority of the ranch (including the 100 acres proposed for the power plant site) is leased for cattle grazing. Approximately 80 acres at the northern end of the ranch are fenced and used to grow rice, and approximately 500 acres at the southern end of the ranch are used to produce row crops.

The Tehama-Colusa Canal is approximately 2,000 feet west of the proposed project site, and the Glenn-Colusa Canal is approximately 3,000 feet to the east of the proposed plant site (Figure 2). The Tehama-Colusa Canal is part of the federal Central Valley Water Project (CVP) that delivers agricultural water to 300,000 acres of farmland in Tehama, Glenn, Colusa, and Yolo Counties. This canal is concrete-lined and bordered by gravel roads on both sides. This type of construction prevents vegetation from establishing itself in or adjacent to the canal, and therefore, the canal has little value as wildlife habitat. The Glenn-Colusa Canal is maintained by the Glenn-Colusa Irrigation District and also provides agricultural water to the region. However, the Glenn-Colusa Canal is bounded by earthen levees. In the project vicinity, this canal is bordered on the east by rice fields and provides habitat for some aquatic and avian species. Both of these canals receive water from the Sacramento River. The Glenn-Colusa Canal also receives runoff from other streams that drain from the east side of the Coast Range, such as Kelly Slough. Hunters Creek drains to the east of the project site, Teresa Creek, which is the local name for the southernmost tributary of Hunters Creek, crosses the project site, and Funks Creek drains the area south of the project site (see Figure 1). In 1976, a reservoir with a capacity of 1,170 acre-feet was constructed on Funks Creek, approximately 2.5 miles southwest of the project site. Although the hydrology and morphology of these streams have been altered, the streams provide valuable habitat for native plants and animals. Tributaries of the Sacramento River, such as Funks Creek and Hunters Creek, are not known to provide habitat for migrating and spawning Chinook salmon, steelhead, and game fish species such as striped bass (*Morone saxatilis*) (NOAA, 2006).

Two seasonal drainages and associated wetlands are located north of the project site (Figure 2). The associated wetlands are dominated by ryegrass (*Lolium perenne*), and support other wetland species such as spikerush (*Eleocharis macrostachya*) and cut-leaf geranium (*Geranium dissectum*).

Habitat at the proposed project site is primarily grassland. Two types of grassland habitat are identified in the study area: California annual grasslands and vernal pool grasslands. California annual grasslands occupy most of the study area and are dominated by nonnative plant species that are typical of degraded grasslands in the Central Valley. Dominant species include yellow star-thistle (*Centaurea solstialis*), medusa head (*Taeniathernum caput-medusae*) cut-leaf geranium, wild oats (*Avena* spp.), ripgut brome (*Bromus diandrus*), and filaree (*Erodium botrys*). These grasslands provide habitat for common wildlife species such as the meadowlark (*Sturnella neglecta*), savannah sparrow (*Passerculus sandwichensis*), and coyote (*Canis latrans*). The vernal pool grasslands are associated with some of the low elevation portions of the study area. Typical plant species are similar, but yellow star thistle and medusa head are less common in these areas. Vernal pool grasslands are identified separately from California annual grasslands because the vernal pool grasslands intergrade with the vernal pools and other seasonal wetlands and are important for maintaining the integrity of the vernal pool wetlands. All of the grasslands in the study area provide habitat for common wildlife species such as the meadowlark (*Sturnella neglecta*), savannah sparrow (*Passerculus sandwichensis*), and coyote (*Canis latrans*).

A complex of vernal pools and associated grasslands is located east and northeast of the PG&E Compressor Station, near the transmission line inter-connection area, and north and south of the existing PG&E access road (Figure 2; Figure 3). Vernal pools are seasonally inundated depressions found on soils with an impermeable layer such as hardpan, claypan, or volcanic basalt. The pools in the project vicinity support plant species typical of alkaline soils, and are interspersed with upland alkali grasslands, which are described below. This complex of vernal pools supports a diverse assemblage of native flora, including species such as coyote thistle (*Eryngium vaseyi*), vernal pool popcorn (*Plagiobothrys stipitatus* ssp. *micranthus*), meadowfoam (*Limnanthes douglasii*), Fremont's goldfields (*Lasthenia fremontii*) and water-starwort (*Callitriche marginata*). All vernal pools are located outside of the proposed project site. However, the vernal pools near the project site have the potential to support special-status branchiopod species that include the federally listed vernal pool fairy shrimp (*Branchinecta lynchi*) and vernal pool tadpole shrimp (*Branchinecta packardi*).

Alkali soils in the vicinity of the seasonal drainages as well as the southwestern corner of the project site and south of the existing PG&E access road, support grassland vegetation that includes species that are tolerant of alkaline soil conditions. These areas are identified in this document as "alkali grasslands." Low vegetation cover and low-growing vegetation characterize alkali grasslands in the study area. Vegetation in these areas includes barley (*Hordeum marinum*; *Hordeum murinum*), soft chess brome (*Bromus hordeaceus*), dwarf peppergrass (*Lepidium latipes* var. *latipes*), cut-leaf plantain (*Plantago coronopus*), peppergrass (*Lepidium nitidum*), erect plantain (*Plantago erecta*), alkali heath (*Frankenia grandifolia*), and storksbill (*Erodium botrys*), California bur-clover (*Medicago polymorpha)*, Parry spikeweed (*Hemizonia parryi*), prickly lettuce (*Lactuca serriola*), swamp pricklegrass (*Crypsis schoenoides*), long-leaf plantain (*Plantago elongata*), soft brome (*Bromus hordeaceus*), and long-beaked filaree (*Erodium botrys*). Most of the alkali grassland areas in the study area are dominated by upland plant species.

Seasonal wetlands are present along the south side of the existing PG&E access road (Figure 3). Both seasonal wetlands directly south of the road are located in shallow topographic depressions that appear to be inundated during the wet season. These two wetlands have the potential to support listed branchiopod species. A band of wetland vegetation along the margins of Teresa Creek is also characterized as seasonal wetlands but these features would not be suitable to support branchiopod species because the wetlands are located within an active stream channel (Figure 4, View 1). Seasonal wetlands at Teresa Creek are dominated by purple vervain (*Verbena bonariensis*), Bermuda grass (*Cynodon dactylon*), dallis grass (*Paspalum dilatatum*), and wild rye (*Leymus triticoides*). Willow herb (*Epilobium brachycarpum*), western goldentop (*Euthamia occidentalis*), knotweed (*Polygonum* sp.), and tule (*Scirpus* sp.) are also present. The seasonal wetlands along the south side of the PG&E access road are dominated by perennial ryegrass, barley, and vernal pool popcorn flower.

Freshwater marsh wetlands are located in irrigation and drainage channels east and west of the Glenn-Colusa Irrigation District Canal and on the margins of rice fields east and west of the Glenn-Colusa Irrigation District Canal (Figure 3). Typical plant species in these wetlands include broad-leaf cattail (*Typha latifolia*), bulrush (*Scirpus acutus*), and smartweed (*Polygonum* sp.).

Cultivated rice fields are located northeast, southeast, and northwest of the Glenn-Colusa Irrigation District Canal and north and south of Teresa Creek (Figure 3; Figure 4, View 1).

Access to the project site from I-5 would be achieved via existing roads. Ruderal vegetation, irrigation channels and drains, and cultivated fields border the existing access roads between I-5 and the project site (Figure 2). Most of the cultivated fields are used for rice production. The rice fields are connected by a network of small canals and drains that provide potential foraging habitat for a number of aquatic species, waterfowl, and migratory birds, including the federally listed giant garter snake (*Thamnophis gigas*).

3.2 SPECIAL-STATUS PLANTS

3.2.1 Hoover's Spurge

Hoover's spurge (*Chamaesyce hooveri*) is federally listed as a threatened species. It is classified as rare by the CNPS. This annual herb is endemic to vernal pool habitats and has been known to occur in Tehama, Glenn, Butte, Colusa, Stanislaus, Merced, and Tulare Counties (CDFG, 2007). Its blooming period is from July to August. This species occurs in large vernal pools, the median size being 1.4 acres (Stone et al., 1988). The closest known occurrence is approximately 8.3 miles away. It was noted in 1992 in the Sacramento NWR. Some of the pools associated with the vernal pool complex adjacent to the project site may have some potential to support this species. However, all of the pools in the project area are quite shallow, and are not likely inundated for long enough to support Hoover's spurge. This species was not observed in the vernal pools in the project site during the site visit on August 24, 2006, which coincided with the blooming period for this species. No designated critical habitat is located within the project site for Hoover's spurge (Federal Register, 2005a).

3.2.2 Hairy Orcutt Grass

Hairy Orcutt grass (*Orcuttia pilosa*) is federally and state listed as an endangered species. It is classified as rare by the CNPS (CNPS, 2006. This annual grass is found in vernal pool habitats and has been identified in Tehama, Glenn, Butte, Stanislaus, Merced, and Madera Counties (CDFG, 2007). It blooms from May to September. This species occurs in large vernal pools, the median size being 4.3 acres (Stone et al., 1988). The closest known location of hairy Orcutt grass was identified in 1994, approximately 6.8 miles away in the Sacramento National Wildlife Refuge. There is a low potential for some of the larger pools associated with the vernal pool complex adjacent to the project area to support hairy Orcutt grass, although none of them are as large as those typically occupied by this species. The few pools present within the project area, where transmission line routes would connect with the existing transmission lines and where proposed roads would be located, are small and shallow. Hairy Orcutt grass was not observed in the vernal pools in the project site during the site visit on August 24, 2006, which coincided with the blooming period for this species. No designated critical habitat is located within the project site for hairy Orcutt grass (Federal Register, 2005a).

3.2.3 Greene's Tuctoria

Greene's tuctoria (*Tuctoria greenei*) is a federally listed endangered species and a state-listed rare species. It is classified as a List 1B.1 species by the CNPS. This annual herb is known to occur in dry bottoms of vernal pools in open valley and foothill grasslands. It blooms from May to September at elevations of 100 to 3,500 feet (CNPS, 2006). There are no documented occurrences of this species within the eleven 7.5-minute quadrangle review area surrounding the project site (CDFG, 2007). This species was not observed in the vernal pools in the project site during the site visit on August 24, 2006, which coincided with the blooming period for this species. No designated critical habitat is located within the project site for Greene's tuctoria (Federal Register, 2005a).

3.2.4 Palmate-Bracted Bird's Beak

Palmate-bracted bird's beak (*Cordylanthus palmatus*) is federally and state-listed as an endangered species. It is classified as a List 1B.1 species by the CNPS. This species is found on alkaline soil on an alkaline substrate. Most of the known occurrences are on Pescadero silty clay soils (CDFG, 2007). It is a hemiparasitic annual, and the host plant is believed to be saltgrass (USFWS, 1988). The combination of being dependent on other plants for water and nutrients, salt excretion, and a deep root system are factors that allow this species to grow during the late summer months when most other California annuals have died. It blooms from May to October. It has been known to occur in Glenn, Colusa, Yolo, Alameda, San Joaquin, Madera, and Fresno Counties (CNPS, 2006). The closest known location was identified in 1993,

6 miles away in the Sacramento National Wildlife Refuge (CDFG, 2007). This species was last seen at the Refuge in 2004.

URS biologists visited a known occurrence of this species along "Road 103," near the town of Woodland, California, on May 10, 2001. The palmate-bracted bird's beak at the site was well developed, and easily identifiable. Based on this observation, this species would have been detected during rare plant surveys conducted on May 11, 2001, or during the additional site visits conducted in August and September 2006 if it were present in the project site. Therefore, palmate-bracted bird's beak is not present in the project site.

No critical habitat rules have been published for the Palmate-bracted bird's beak.

3.3 SPECIAL-STATUS WILDLIFE SPECIES

3.3.1 Green Sturgeon

The USFWS added the Southern Distinct Population Segment of the North American green sturgeon as threatened on April 4, 2007 (Federal Register, 2007). The southern DPS of the green sturgeon consists of all coastal and Central Valley populations south of the Eel River, with the only known spawning population in the Sacramento River (Federal Register, 2006a).

The green sturgeon is anadromous, spending its adult life in the ocean but ascending coastal streams in the winter where it remains to spawn the following summer. Adults typically begin migrating in February and spawn from March through July, with a peak from mid-April to mid-June (Moyle et al., 1995). Green sturgeon are thought to spawn every 3 to 5 years in deep pools with turbulent water velocities and prefer large cobble substrates, but substrate size can range from clean sand to bedrock (NOP, 2001). Adult green sturgeons are presumed to leave shortly after spawning but larval green sturgeon may remain in the rivers and appear to move farther downstream as water flows increase. Juvenile green sturgeons spend one to four years in fresh and estuarine waters before dispersal to saltwater (Beamesderfer and Webb, 2002).

No critical habitat rules have been published for the Southern DPS of the North American green sturgeon.

In a letter from the National Marine Fisheries Service to the ACOE dated August 2, 2007, NMFS determined that adverse impacts to federally listed salmonids will be avoided because listed salmonids and designated critical habitat are not present in the project area. NMFS also confirmed that the project would not affect any Essential Fish Habitat.

3.3.2 Northern Spotted Owl

The northern spotted owl (*Strix occidentalis caurina*) is listed as federally threatened. This species is a forest bird that inhabits coniferous and mixed conifer-hardwood forests extending from southwestern British Columbia to northwestern California. The project site contains no habitat of this type, and therefore, the northern spotted owl is unlikely to occur. No designated critical habitat is located within the project site for the northern spotted owl (Federal Register, 1992).

3.3.3 Giant Garter Snake

The giant garter snake (*Thamnophis gigas*) is listed as threatened under the federal ESA. This mostly aquatic snake is the largest of the garter snake genus, *Thamnophis*, and is endemic to the Valley floors of the Sacramento and San Joaquin Valleys (USFWS, 1999). Before the conversion of the Central Valley to agricultural lands, giant garter snakes inhabited vast tule and cattail marshes. Today the snakes are found in rice fields, canals, and irrigation ditches (Biosystems Analysis, 1994). Giant garter snakes hunt small

fish, tadpoles, and frogs during the spring, summer, and early fall. From late October to late March, giant garter snakes hibernate above the high water line. Hibernaculae are often abandoned rodent burrows, but the snakes can also hibernate in other types of cracks or crevices that would provide them with adequate shelter.

Land use in the region adjacent to and immediately east of the project site is dominated by rice farming. These rice fields are connected via an extensive network of irrigation canals and drains. This network of aquatic habitat is one of the few types of habitat that still supports giant garter snake. Contiguous with the rice field habitat, just across I-5, lies the Sacramento National Wildlife Refuge. This refuge contains extensive wetland habitat that may support giant garter snakes. In 1999 a giant garter snake was found dead on Riz Road, approximately 9 miles northeast of the project site, just north of the Sacramento National Wildlife Refuge (CDFG, 2007). An occurrence of giant garter snake was reported in 1987 from a site approximately 10 miles south of the proposed plant site. This species is also known to occur at the Delevan National Wildlife Refuge, located approximately 10 miles east/southeast of the proposed plant site. Given the suitability of habitat and the recent nearby occurrences, giant garter snakes may be present in aquatic habitat (canals and rice fields) between I-5 and the project site.

No critical habitat has been designated for the giant garter snake.

3.3.4 Delta Smelt

Delta smelt (*Hypomesus transpacificus*) is a federally threatened species. Historically, the Delta smelt is thought to have occurred from Suisun Bay upstream to the City of Sacramento on the Sacramento River and the City of Mossdale on the San Joaquin River (Moyle et al., 1992). Delta smelt spawn in shallow, fresh or slightly brackish water upstream of the mixing zone (Wang, 1991), mostly in tidally-influenced backwater sloughs and channel edgewaters (Moyle, 1976; Wang, 1986, 1991; Moyle et al., 1992). In the Delta, spawning is known to occur in the Sacramento River and in Barker, Lindsey, Cache, Georgiana, Prospect, Beaver, Hog, and Sycamore Sloughs (Wang, 1991). Delta smelt also spawn north of Suisun Bay in Montezuma and Suisun Sloughs and their tributaries. Based on the known distribution it is unlikely that Delta smelt have the potential to occur on the proposed project site.

No designated critical habitat is located within the project site for Delta smelt (Federal Register, 1994a).

3.3.5 Chinook Salmon

Chinook salmon historically ranged from the Ventura River in California to Point Hope, Alaska, on the eastern edge of the Pacific and in the western portion of the Pacific Ocean from Hokkaido, Japan, to the Anadyr River in Russia (Healey, 1991). The general life history of the anadromous Chinook salmon includes both freshwater and oceanic phases of development. Incubation, hatching, and emergence occur in freshwater, followed by migration to the ocean at which time smoltification occurs. Maturation is initiated and completed upon return to freshwater habitats. Once maturation is complete, spawning occurs in natal streams.

The National Marine Fisheries Service (NMFS) classifies and lists salmon by Evolutionarily Significant Unit (ESU). Factors used in determining ESUs include spatial, temporal, and genetic isolation, maturation rates, and other life history traits. Three Chinook salmon ESUs migrate through the Sacramento River, and they all receive some federal and state protection.

The Central Valley Spring Run ESU spawns in the Sacramento River basin and is federally listed as threatened. This ESU typically enters fresh water between April and June, with spawning occurring between August and October. Juvenile out-migration typically occurs between October and December.

The Sacramento Valley Winter Run ESU spawns in the Upper Sacramento River below Keswick Dam and is federally listed as endangered. This ESU typically enters fresh water between January and May, with spawning occurring May through July. Juvenile out-migration occurs during February and March.

Neither of the two Chinook salmon ESUs described above have designated critical habitat in the project site (Federal Register, 1993 and 2005b).

An adult steelhead (*Onchorhynchus mykiss*) was observed below the Teresa Creek Bridge, in the southernmost tributary to Hunters Creek, known locally as Teresa Creek (Figure 1; Figure 4, View 1). Hunters Creek is a tributary to the Sacramento River, and based on the steelhead observation the creek may be accessible to Chinook salmon as well.

Anadromous fish are not likely to be present in the Glenn-Colusa Canal or the Tehama-Colusa Canal since both canals have fish screens at their respective diversion points on the Sacramento River. The diversion point for the Tehama-Colusa Canal is located at the Red Bluff Diversion Dam. The diversion point for the Glenn-Colusa Canal is located at a dam north of Hamilton City. Both canals lack substrates and in-stream vegetation that are suitable for spawning or rearing anadromous fish. Downstream migration of juvenile fish would be constrained by the presence of predators and substantial barriers. Both canals lack vegetation or other structures that would provide cover and foraging opportunities for juvenile fish. No anadromous fish are known to occur in the Glenn-Colusa Canal or Tehama-Colusa Canal.

In a letter from the National Marine Fisheries Service to the ACOE dated August 2, 2007, NMFS determined that adverse impacts to federally listed salmonids will be avoided because listed salmonids and designated critical habitat are not present in the project area. NMFS also confirmed that the project would not affect any Essential Fish Habitat.

3.3.6 Central Valley Steelhead

The Central Valley steelhead Distinct Population Segment (DPS) is federally listed as threatened. This ESU occurs in river basins from the Sacramento River to San Francisco Bay. This species can be either anadromous, meaning it migrates from fresh water to the ocean and returns to spawn in fresh water, or it can complete its entire life cycle in fresh water. Those fish that remain in fresh water are referred to as rainbow trout. Steelhead, the anadromous form of *O. mykiss*, can spend several years in fresh water prior to smoltification and can spawn more than once before dying, unlike most other salmonids (Busby et al., 1996). Adult steelhead typically enter freshwater between December and May, with most spawning occurring before the end of May. Juvenile out-migration typically occurs during April and May.

Critical habitat for the Central Valley steelhead DPS is not present in the project site (Federal Register, 2005b).

An adult steelhead was observed by a URS biologist in Teresa Creek on March 9, 2001. This fish was observed below the bridge across Teresa Creek, the southernmost tributary to Hunters Creek (Figure 1; Figure 4, View 1). Hunters Creek is a tributary to the Sacramento River. The total annual hatchery and wild populations for the Sacramento River was estimated in the early 1990s. The population, based on Red Bluff Diversion Dam counts, hatchery counts, and past natural spawning escapement estimates for some tributaries, was estimated to be no greater than 10,000 adult fish (McEwan and Jackson, 1996). Although Teresa Creek is channelized between earthen levees, anadromous fish may occasionally stray into this stream. However, habitats in Teresa Creek are not likely to be suitable for spawning or rearing anadromous fish because the stream lacks gravel substrates and vegetation cover that steelhead and salmon would require. The stream channel substrate consists of small-diameter gravels that are not appropriate for spawning.

It is highly unlikely that Central Valley steelhead are present in the Glenn-Colusa Canal or the Tehama-Colusa Canal, as the habitat in these canals is not suitable for this species. In addition, no Central Valley steelhead were observed in the Glenn-Colusa Canal or the Tehama-Colusa Canal during site visits in 2001, 2006, and 2007.

In a letter from the National Marine Fisheries Service to the ACOE dated August 2, 2007, NMFS determined that adverse impacts to federally listed salmonids will be avoided because listed salmonids and designated critical habitat are not present in the project area. NMFS also confirmed that the project would not affect any Essential Fish Habitat.

3.3.7 Branchiopods

Animals in the class Branchiopoda are set apart from other Crustacea by their swimming appendages that double as gills. These appendages, along with a deep ventral food groove, form a filter feeding apparatus located behind the head. Branchiopods, including fairy shrimps (order Anostraca), clam shrimps (order Conchostraca), tadpole shrimps (order Notostraca), and water fleas (order Cladocera) use this apparatus filter food from the water in which they live, or scrape food off rocks and sediment.

Many elements of the life cycles of the branchiopod species described in the following subsections are similar. Hatching begins shortly after temporary pools have been inundated by runoff from fall and winter rains. Newly hatched larvae develop through a juvenile stage and eventually become sexually mature adults. A sexually mature female can be identified by the presence of one or more cysts in her ovisac (Eriksen and Belk, 1999). After males and females mate, the female releases her cysts, which would remain in the bottom of the dry pool through the summer.

Habitat potentially supporting branchiopod species in the project area is limited. The majority of suitable branchiopod habitat is concentrated east of the PG&E Compressor Station, outside of the proposed project site. This concentration of suitable habitat consists of a well-developed complex of vernal pools characterized by mima-mound topography and alkali soils. Drainage through the complex is from the northwest to the southeast, and the pool depth and definition increases to the southeast, reaching a maximum north of the PG&E access road where the complex terminates along a dike bordering a rice field. The existing PG&E access road currently cuts off the southeastern end of the vernal pool complex, and isolates a few well-defined pools. These few pools are located near the project's proposed road alignment on the west side of the Glenn-Colusa Canal. Vernal pools are also located in the vicinity of the proposed transmission line interconnection; although no pools are located within the 10,000-square-foot construction disturbance areas surrounding the towers (Figure 5). Impacts to vernal pools would be avoided and minimized through measures discussed in Section 4.3.2.

Designated critical habitat for the Conservancy fairy shrimp, vernal pool fairy shrimp, or vernal pool tadpole shrimp is not present within the project site (Federal Register, 2005a and 2006b).

Conservancy fairy shrimp (*Branchinecta conservatio*) is a federally listed endangered species. This fairy shrimp is endemic to California, and is found in grasslands in the northern two-thirds of the Central Valley (Eriksen and Belk, 1999). It inhabits large, turbid pools (CDFG, 2007). These pools typically have low conductivity, total dissolved solids, and alkalinity. Within its narrow geographic range it is only known from a limited number of sites, including a vernal pool in the Sacramento NWR, approximately 5 miles east of the proposed plant site (CDFG, 2007). There may be some potential for Conservancy fairy shrimp to occur in pools associated with the vernal pool complex located east of the PG&E Compressor Station.

None of the pools in the project vicinity appears to be of the type that typically supports Conservancy fairy shrimp because the observed duration of inundation is less than the 4 to 6 months typical at other Conservancy fairy shrimp locations. Most of the documented locations for Conservancy fairy shrimp are

large playa type pools that can last into June (Eriksen and Belk, 1999). This species is not likely to be present at the project site or in the immediate vicinity. The presence of this species is assumed within all vernal pools in the project vicinity.

Vernal pool fairy shrimp (*Branchinecta lynchi*) is a federally listed threatened species. This species is rather widely distributed through the grasslands of California, from Shasta County south to Riverside County. Populations of vernal pool fairy shrimp are often small, and this species tends to be outnumbered by other co-occurring species. Vernal pool fairy shrimp occur in a wide variety of pool types, but are most commonly found in small swales, or vernal pools in unplowed grasslands (Eriksen and Belk, 1999).

Although it is fairly widely distributed throughout the Central Valley, *B. lynchi* is not common on the western side of the Sacramento Valley. The CNDDB does not contain any occurrence records for *B. lynchi* in Colusa County (CDFG, 2007). The nearest CNDDB occurrence records from the western side of the Sacramento Valley are from northern Glenn County. At the Sacramento NWR enough sampling has been conducted to detect at least three other species of Branchinectids on the western side of the Valley, but *B. lynchi* has not been detected there (Silviera, 2001). One source reports a single occurrence of *B. lynchi* from the center of Colusa County, but no additional information was provided (Eriksen and Belk, 1999). However, vernal pool habitat concentrated east of the PG&E Compressor Station appears suitable for this species. Given the low suitability of the habitat, in concert with the lack of occurrences from the region, this species has a low potential to occur in vernal pools in the project vicinity. The presence of this species is assumed in all vernal pools in the project vicinity and in the two seasonal wetlands south of the existing PG&E access road within the project site.

Vernal pool tadpole shrimp (*Lepidurus packardi*) is a federally listed endangered species. This species is found mainly in the northern and eastern portions of the Central Valley, in vernal pools and swales containing highly turbid water, often in unplowed grasslands. Tadpole shrimps are known to prey upon fairy shrimps, and although it has not been documented, the vernal pool tadpole shrimp probably preys on fairy shrimp when they co-occur (Eriksen and Belk, 1999).

The only occurrence of vernal pool tadpole shrimp within the project vicinity is approximately 4 miles northeast of the project site in the Sacramento National Wildlife Refuge (CDFG, 2007). Vernal pool habitat concentrated immediately east of the PG&E Compressor Station is suitable for this species. The presence of this species is assumed in all vernal pools in the project vicinity and in the two seasonal wetlands south of the existing PG&E access road within the project site.

3.3.8 Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) is listed as a federally threatened species. This beetle is associated with elderberry trees (*Sambucus* spp.) in California's Central Valley during all stages of its life cycle. The elderberry tree is associated with riparian forests which occur along rivers and streams in the Valley. There are no riparian forests or elderberry trees located on the proposed project site, therefore the beetle has no potential to occur there. Designated critical habitat for the valley elderberry longhorn beetle is not present in the project site (Federal Register, 1980).

3.3.9 Least Bell's Vireo

Least Bell's vireo (*Vireo bellii pusillus*) is a federal endangered species. This species nests and forages in willow scrub vegetation. The vireo has been extirpated from northern California. This species is not likely to occur in the project site, since no riparian thickets are present. Designated critical habitat for the least Bell's vireo is not present within the project site (Federal Register, 1994b).

3.3.10 Western Yellow-Billed Cuckoo

Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) is a candidate for federal listing. This bird is a riparian forest nester and nests along the broad, lower flood bottoms of larger river systems (CDFG, 2007). Specifically this species nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape. There are no riparian thickets located in the project site; thus, western yellow-billed cuckoo is unlikely to occur there. Critical habitat has not yet been designated for the western yellow-billed cuckoo.

3.3.11 California Tiger Salamander

California tiger salamander is a federally threatened species. For a complete discussion on the life-history of California tiger salamander species and the potential presence of this species in the project site and vicinity, please refer to the Supplemental Letter to the Biological Assessment that was transmitted to the USFWS on August 24, 2007 (Appendix B).

3.3.12 California Red-Legged Frog

The California red-legged frog (*Rana aurora draytonii*) is a federally threatened species. This species occurs primarily in ponds or pools of intermittent stream courses that persist long enough for breeding and development of young. Breeding time depends on winter rains, but is usually between late November and late April (Jennings and Hayes, 1994; Zeiner et al., 1988).

Larvae typically metamorphose between July and September; 14 to 28 weeks after eggs are laid (USFWS, 2002). Adults require dense, emergent or shoreline riparian vegetation closely associated with deep (more than 27.6 inches), still or slow moving water (Jennings and Hayes, 1994). In streams, red-legged frogs are commonly associated with backwater pools that provide protection from high flows. Good water quality is a key habitat indicator, as is the absence of introduced bullfrogs and predatory fishes, which feed on larvae at higher levels than co-evolved predators. California red-legged frogs may aestivate in small mammal burrows and moist leaf litter (Jennings and Hayes, 1994), especially during dry periods (i.e., mid-to-late summer). Boulders, rocks, and downed woody debris also provide cover and moisture during the dry season.

The California red-legged frog has been extirpated from 24 of the 46 counties in California that it once inhabited (USFWS, 2002). Although still common in the San Francisco Bay area and along the central coast, it has been completely extirpated from the floor of the Central Valley, which has effectively isolated Sierra Nevada foothill populations. These populations may have been dependant on immigrants from the valley floor, and currently only a few drainages in the foothills of the Sierra Nevada, in Butte County and El Dorado County, are known to support California red-legged frogs.

The CNDDB does not report any occurrences of the California red-legged frog within the eleven 7.5-minute quadrangle review area surrounding the project site (CDFG, 2007). Biologists who are familiar with this species believe that the red-legged frog has been extirpated from the low elevations of the Central Valley by nonnative predators and the loss of habitat (Jennings, 2006). Therefore, the California red-legged frog is not likely to occur in the project site.

4.0 ENVIRONMENTAL IMPACTS AND MITIGATION

4.1 INTRODUCTION

Potential impacts to listed, proposed and candidate species are evaluated for the following components shown on Figure 2, Figure 3, and Figure 4:

- Power generation facility
- Switchyard
- Plant access road
- Transmission line interconnection
- Natural gas pipeline
- Water supply pipeline and service road
- 100-acre property line fence
- Water intake at the Tehama-Colusa Canal
- Teresa Creek Bridge replacement
- Glenn-Colusa Canal Bridge replacement and road alignment
- Delevan/McDermott Road intersection
- Temporary construction areas

A summary for the estimated land disturbance area for construction and operation for each of these facilities can be found in Table 1.

4.2 IMPACTS TO LISTED SPECIES

4.2.1 Plant Species

Based on the results of focused plant surveys, no federally listed plant species are present in the project site or vicinity; thus, no special-status plant species would be impacted by the proposed project.

4.2.2 Wildlife Species

This section evaluates federally listed wildlife species that could potentially occur in the project site and the vicinity.

4.2.2.1 Northern Spotted Owl

The project site contains no suitable habitat for this species; therefore, the northern spotted owl is not expected to be impacted by the proposed project.

4.2.2.2 Giant Garter Snake

4.2.2.2.1 Bridge and Road Construction

Placement of gravel along the east side of Delevan Road, both north and south of the intersection with McDermott, could affect the giant garter snake. If snakes lie inactive in holes, cracks, or burrows in the area where gravel would be placed, individual snakes could be harmed. The potential for a snake to be harmed increases if work would be conducted during its inactive season (October-April). Bridge work at the Teresa Creek Bridge has the potential to affect the giant garter snake. The temporary detour that may be used while the bridge is under construction would be constructed through rice fields that may be utilized by foraging giant garter snakes. Although the flow of water in Teresa Creek may be more rapid than preferred by giant garter snakes for foraging, the stream's location between two rice fields and the lack of riparian vegetation increase the likelihood that the snake may occur there. Based on the presence

of suitable habitat, any disturbance of this habitat could result in harm, injury, or direct mortality of giant garter snakes. Disturbance of this habitat due to the temporary bridge crossing would last less than one year.

Construction of the new Glenn-Colusa Canal Bridge and road alignment could adversely affect the giant garter snake. The proposed alignment would permanently and temporarily impact cultivated rice fields, agricultural ditches, freshwater marsh habitats, and associated ruderal upland habitat, which have the potential to be utilized by giant garter snakes (Figure 3). Temporary impacts associated with the construction of the Glenn-Colusa Canal Bridge and road alignment would last less than one year.

Impacts to giant garter snake habitat as a result of the two bridge replacements is summarized in Table 8. These activities are likely to adversely affect the giant garter snake. Impacts to giant garter snake would be minimized and avoided by implementation of measures described in Section 4.3.1. Unavoidable permanent impacts to giant garter snake habitat would be mitigated according to ratios defined in the USFWS programmatic consultation for giant garter snake (USFWS, 1997). Implementation of the avoidance and minimization measures and the purchase of mitigation credits would reduce impacts to giant garter snake to a less than significant level.

4.2.2.2.2 Construction Traffic

During construction of the proposed plant, traffic on roadways between I-5 and the plant site would increase more than 100 percent, with an expected peak of 441 daily construction round trips, lasting for a period of a few months, and average daily construction round trips of 221 over a 2-year construction period. Road-kill may be a major factor contributing to the mortality of giant garter snakes in the project vicinity, because they may bask on roadways that often border suitable aquatic habitat. Many of the roadways leading from I-5 to the proposed plant site are bordered by rice fields and irrigation ditches. Snakes may come up onto the roadway and be killed by traffic. If snakes occur in these ditches, this type of mortality likely occurs with some regularity. Because traffic on these roadways is expected to more than double during construction, increased traffic would likely result in a significant increase in giant garter snake mortality along roadways bordered by aquatic habitat between I-5 and the proposed plant site.

Measures are proposed in Section 4.3.1 to avoid or minimize potential adverse effects on the giant garter snake. Compensation is proposed to address impacts that are not fully avoided.

4.2.2.3 Delta Smelt

The project site contains no suitable habitat for this species; therefore, the Delta smelt is not expected to be impacted by the proposed project.

4.2.2.4 Fish Species Under NMFS Jurisdiction

In a letter from the National Marine Fisheries Service to the ACOE dated August 2, 2007, NMFS determined that adverse impacts to federally listed salmonids will be avoided because listed salmonids and designated critical habitat are not present in the project area. NMFS determined that the proposed project is not likely to adversely affect Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, and the Southern DPS of North American green sturgeon, or their designated critical habitat. NMFS also confirmed that the project would not affect any Essential Fish Habitat.

4.2.2.5 Branchlopods

The proposed transmission line interconnection and the existing PG&E access road are located in the vicinity of vernal pool habitat that could support listed vernal pool branchiopods including the vernal pool fairy shrimp and the vernal pool tadpole shrimp.

The location where the new transmission lines would tie into the existing transmission lines is on the periphery of the vernal pool complex (Figure 2; Figure 5). No vernal pools are located within the 10,000-square-foot disturbance areas of the transmission towers (Figure 5). Well-developed vernal pools are located directly north and south of the existing PG&E access road (Figure 3). No vernal pools would be directly impacted by the proposed project. However, indirect changes in hydrology could adversely affect branchiopod populations. Measures are proposed to minimize the potential for indirect effects of construction activities on the hydrology or water quality of seasonal wetlands and vernal pools that may be occupied by listed branchiopod species.

Two seasonal wetlands that have the potential to support listed branchiopod species would be permanently and temporarily impacted by the proposed project. The two seasonal wetlands are located on the southwestern side of the GCID Canal, directly south of the existing PG&E access road (Figure 3). The Glenn-Colusa Canal Bridge alignment would directly impact the northern margins of these seasonal wetlands (the area of direct impact would be 0.018 acre).

The proposed project could result in potentially significant direct and indirect impacts to branchiopod species that would be minimized and avoided by implementation of measures described in Section 4.3.2. Unavoidable permanent impacts to listed branchiopod habitat would be mitigated according to preservation and creation ratios defined in the USFWS programmatic consultation for listed branchiopods (USFWS, 1996). The implementation of the avoidance and minimization measures and the purchase of mitigation credits would reduce impacts to listed branchiopod species to a less-than-significant level, as discussed in Section 4.3.2.

4.2.2.6 Valley Elderberry Longhorn Beetle

Blue elderberry shrubs (*Sambucus mexicana*), the host plant for the valley elderberry longhorn beetle, are not present on the project site. Therefore, the valley elderberry longhorn beetle would not be affected by the proposed project.

4.2.2.7 Least Bell's Vireo

No habitats that are suitable for the least Bell's vireo are present on the project site. Therefore, the least Bell's vireo would not be affected by the proposed project.

4.2.2.8 Western Yellow-Billed Cuckoo

No habitats that are suitable for the western yellow-billed cuckoo are present on the project site. Therefore, the proposed project would not affect the yellow-billed cuckoo.

4.2.2.9 California Tiger Salamander

As discussed in the August 24, 2007 supplement to the Biological Assessment that was transmitted to the USFWS, California tiger salamander is unlikely to be present on the project site and the proposed project is not likely to adversely affect this species (Appendix B). However, one seasonal pond in the project vicinity may be suitable for California tiger salamander breeding. Previous studies have confirmed that most California tiger salamanders aestivate in upland areas within 0.7 mile of breeding sites. Therefore,

measures are described in Section 4.3.3 that would further reduce the potential that the proposed project would affect California tiger salamander, if it were present.

4.2.2.10 California Red-Legged Frog

California red-legged frog is not likely to be present in the project area because the aquatic habitats are either too ephemeral (e.g., vernal pools and seasonal ponds) or receive substantial summer irrigation runoff that would support populations of bullfrog and nonnative fish species that prey on larval red-legged frogs. Therefore, the proposed project is not likely to affect the California red-legged frog.

4.2.3 Other Effects of the Proposed Project on Biotic Resources

Operation of the proposed plant would have some additional effects on biological resources. These impacts are described below.

4.2.3.1 Noise

The plant would produce noise both during construction and operation. Although much of the land surrounding the proposed plant site is undeveloped, some existing background noise is generated by the PG&E Compressor Station. Noise may cause slight disturbance of wildlife using nearby areas, including migratory bird species. However, wildlife would become accustomed to habitual noise associated with plant operation. Impacts would be less than significant.

4.2.3.2 Electrocution Hazard

Additional transmission lines on the project site would increase collision and electrocution hazard for raptors. Birds that collide with transmission lines or raptors that perch on towers can be electrocuted if they complete an electrical circuit by touching two or more live electrical conductors or a live conductor and a grounded surface. However, electrocution is unlikely to occur on the proposed transmission lines because the distance between conductors or between conductors and the ground wire is large enough that it is unlikely a bird could complete a circuit and be electrocuted. The transmission lines proposed for this project would have a minimum distance greater than the wingspan of any birds that occur in the project vicinity. Electrocution is a hazard on smaller distribution lines where the lower voltages allow less separation between conductors. The transmission lines would be designed and built in accordance with the Avian Power Line Interaction Committee's Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (APLIC 2006). Therefore, no significant impacts are expected with regard to bird electrocutions at transmission line routes.

4.2.3.3 Collision Hazard

The proposed transmission line interconnection addressed above with respect to electrocution hazard could pose a collision hazard to avian species that may fly into the lines. Less than 1 mile of new transmission lines would be installed, and these lines would connect to an existing transmission line. The new segment would be located in an area that does not bisect important waterfowl feeding or resting areas. No significant impact is expected with regard to bird collision with new transmission lines.

The 175-foot-high heat recovery steam generator stacks would also increase collision potential for avian species. The potential for collisions would be highest for migrating waterfowl or other species of birds, especially small insect-eaters that migrate at night. In many cases, birds migrating at night are guided in part by constellations and can become confused by brightly lit tall structures. Fog or low cloud cover can further add to collision potential, although fog does not occur with much frequency in the project area. The stacks would not be adjacent to aquatic habitats that attract large numbers of migratory birds. Although the number of potential collisions cannot be quantified, collisions would likely occur relatively

infrequently. Potential collision hazards are not considered a significant impact because the location of the stacks and the transmission lines would not be located in a flyway of migrating water fowl or other species of birds.

4.2.3.4 Air Pollutant Emissions

The proposed plant is a dry-cooled plant, and no cooling tower drift is associated with this type of plant. Emissions from the proposed plant are not expected to significantly affect biological resources surrounding the project area. Potential pollutant stack emissions include carbon monoxide (CO), inhalable particulates (PM_{10}), and oxides of nitrogen and sulfur (NO_X and SO_2). No pollutant emissions are predicted to result in concentrations that exceed the applicable U.S. EPA prevention of significant deterioration (PSD) significant impact levels for either short-term or annual averaging periods for CO, PM_{10}, NO_2, and SO_2.

4.2.3.5 Water Supply

Water would be supplied by the Glenn-Colusa Irrigation District (GCID), transferred to Colusa County, transported to the plant vicinity via the Tehama-Colusa Canal through an existing wheeling agreement with the Tehama-Colusa Canal Authority (TCCA), and delivered to the plant via a new water supply pipeline. The proposed project's water requirements of approximately 126 acre-feet per year would be a small proportion of the water flowing through the Tehama-Colusa Canal.

The proposed project's maximum withdrawal of approximately 132 gallons per minute (gpm) would be less than significant when compared to the approximately 2,000 cubic feet per second (9 million gpm) of canal flow past the site. TCCA operates the Tehama-Colusa Canal and its 26 pools to keep it full throughout the year. The project would not change or result in any adverse effects to TCCA's operations of the canal. Therefore, there would be no adverse impact on water supply or other users of this source.

The proposed project would not increase water diversion to the Sacramento River or decrease water supply to agricultural lands. In addition, particular features have been incorporated into the project design to protect water quality, as described in Sections 8.14.2.1 and 8.14.2.2 of the 2006 Application for Certification submitted to the California Energy Commission in November 2006. Impacts to water supply in the region would be less than significant.

4.2.4 Cumulative Effects

Several potential development proposals have been brought to the attention of the Colusa County Planning Department, but no formal applications have been submitted (Hackney, 2006). An 18-unit subdivision is proposed to be developed to the west of the city of Maxwell, approximately 5 miles southeast of the project site. No further information is available on the potential projects, nor is there any available information on their schedules or likelihood of submitting an application. Thus, based on information that no development applications have been submitted, potential cumulative impacts to biological resources would be less than significant.

4.3 PROPOSED CONCEPTUAL MITIGATION

Impacts to biotic resources and corresponding mitigation measures are discussed below. The following subsections describe the measures that are proposed to avoid, minimize, or compensate for adverse impacts to listed species. No mitigation measures are proposed to be implemented for species that are not likely to be affected by the proposed project.

4.3.1 Giant Garter Snake

The "reasonable and prudent measures" described by the USFWS (1997) would be implemented to minimize the potential for incidental take of giant garter snakes during the Teresa Creek Bridge replacement, Glenn-Colusa Canal Bridge replacement, the PG&E access road alignment, and during placement of gravel along the east side of Delevan Road. These measures are summarized below.

4.3.1.1 Construction Requirements in Giant Garter Snake Habitat

The following measures are proposed to minimize the potential for take of this species during construction associated with the bridge replacements, the PG&E access road alignment, and during the placement of gravel along the east side of the Delevan Road/McDermott Road intersection. Implementation of these measures would reduce the impacts to the giant garter snake to less-than-significant levels:

- All construction activity associated with the Teresa Creek Bridge replacement, the Glenn-Colusa Canal Bridge replacement, the PG&E access road alignment, and during placement of gravel along the east side of the Delevan Road/McDermott Road intersection would be conducted between May 1 and October 1. This is the active period for giant garter snakes and direct impacts are lessened because snakes are actively moving and avoiding danger.

- Any dewatered habitat must remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling the dewatered habitat.

- All construction personnel would participate in a USFWS-approved worker environmental awareness program. Workers would be informed about the presence of the giant garter snake and that unlawful take of the animal or destruction of its habitat is a violation of the Endangered Species Act (ESA). A qualified biologist shall instruct the construction personnel about (1) the life history of the snake; (2) the importance of irrigation canals, wetlands, and seasonally flooded areas such as rice fields, to the giant garter snake; and (3) the terms and conditions of any agreement reached with the USFWS.

- Exclusion fencing would be installed along the margins of temporary disturbance areas within giant garter snake aquatic or terrestrial habitat.

- Clearing of vegetation from the stream would be confined to the minimal area necessary to excavate toe of bank for fill placement.

- Areas designated for avoidance would be clearly marked as environmentally sensitive and avoided by all construction personnel.

- A USFWS-approved biologist would inspect the work area within 24 hours prior to commencement of construction activities. The monitoring biologist would be available thereafter, and if a snake is encountered during construction, the monitoring biologist shall have the authority to stop construction activities until appropriate corrective measures have been completed or it is determined that the snake would not be harmed.

- After construction, any temporary fill or debris shall be removed and all disturbed areas would be restored to pre-project conditions (see Glenn-Colusa Canal and Teresa Creek Revegetation, in Section 4.3.5).

The following measure is proposed to minimize the potential for increased traffic on roadways between the proposed plant site and I-5 to result in an increased incidence of road-killed giant garter snakes. Implementation of this measure would reduce this impact to a less-than-significant level.

4.3.1.2 Road-Kill Avoidance

Construction speed limits of 20 miles per hour are proposed to minimize the potential for increased traffic volumes to result in an increased incidence of road-kill of giant garter snakes during project construction. These construction speed limits would be posted on project-controlled roads leading to the project site, and all traffic to and from the plant site would be required to obey the speed limit. These signs, or other signs posted along the same route, would alert drivers to the potential presence of snakes. Additionally, a worker awareness program would be used to inform all workers of the need to watch for and avoid snakes that may be present along roadways. This program would require that drivers entering the project site be provided with an informational handout. This would reduce the potential for construction traffic to impact giant garter snakes to a less-than-significant level.

4.3.1.3 Giant Garter Snake Habitat Replacement

The proposed PG&E access road alignment, the Teresa Creek Bridge Replacement, and the construction of the Glenn-Colusa Canal Bridge would result in permanent and temporary loss of giant garter snake habitat. Please refer to Table 8 for mitigation ratios and acreages for each habitat type. According to the USFWS 1997 Programmatic consultation, permanent and temporary impacts to giant garter snake habitat would be mitigated according to the following measures:

- Onsite restoration of giant garter snake habitat temporarily impacted by the proposed project to pre-project conditions;
- Replacement of permanently impacted giant garter snake habitat at a 3:1 ratio at a USFWS-approved mitigation bank; and
- For each acre of aquatic habitat replaced, 2 acres of upland habitat would be replaced.

The option chosen would be reviewed and approved by the USFWS.

4.3.2 Branchiopods

Protocol surveys to determine presence or absence of special-status branchiopods in the study area have not been conducted. Therefore, the presence of the vernal pool fairy shrimp, Conservancy fairy shrimp, and vernal pool tadpole shrimp is assumed in all vernal pools.

The following measures would be implemented to avoid potential adverse effects to listed branchiopods within vernal pools:

- No ground-disturbing construction activities would occur within 250 feet of vernal pools.
- A USFWS-approved biologist would monitor all ground-disturbing activities .
- All onsite construction personnel would receive a USFWS-approved worker environmental awareness training program to alert them of the sensitive resources and the required avoidance measures.
- All construction activities within 250 feet of vernal pool habitat would be limited to the dry season (May 1 to October 15) when listed vernal pool branchiopods are only present

as durable resting eggs (cysts) and branchiopod habitat is less likely to be indirectly affected by erosion or sedimentation.

- Upon completion of the project, all areas that have been temporarily impacted by the project would be restored to approximate original site conditions (e.g., topography, hydrology, and vegetation).

The following additional listed branchiopod avoidance and minimization measures are specific to work activities associated with the transmission line towers:

- Prior to construction, a buffer zone, located 250 feet from the wetland margins of the vernal pools with potential to be indirectly disturbed during construction, would be clearly marked as a sensitive area by a USFWS-approved biologist.

- All ground-disturbing activities would be excluded from the buffer zone for the duration of construction. Only rubber-tired vehicles would be allowed within the buffer zone. To protect special-status plants and the cysts of listed vernal pool branchiopods, no vehicles or personnel would be allowed within the wetland boundaries of the vernal pools.

- An existing dirt road would be used to access the existing transmission line towers (Figure 5). Access to the new transmission line segments would be located within the corridor of the proposed alignment (Figure 2; Figure 5). If necessary, a path may be mowed through the vegetation to reduce fire hazard, using an attachment to the rubber tired vehicle. No blading of vegetation would occur.

The presence of vernal pool fairy shrimp and vernal pool tadpole shrimp is also assumed in seasonal wetland habitat directly south of the existing PG&E access road west of the Glenn-Colusa Canal. The Glenn-Colusa Canal Bridge replacement would result in permanent and temporary loss of the seasonal wetlands, and the associated vernal pool branchiopod habitat. Unavoidable permanent impacts to listed branchiopod habitat would be mitigated according to preservation and creation ratios defined in the USFWS programmatic consultation for listed branchiopods (USFWS, 1996). Preservation and creation credits of listed branchiopod habitat would be purchased at a USFWS-approved mitigation bank. Table 9 summarizes the compensatory mitigation.

The following additional listed branchiopod avoidance and minimization measures are specific to work activities associated with roadwork on the existing PG&E access road west of the new Glenn-Colusa Canal Bridge approach road:

- Paving of the existing PG&E access road west of the new bridge approach would be confined to the top of the existing road embankment. The road would be repaved but the shoulders of the road would not be widened and no ground-disturbing work would occur on the sides of the embankment. Repaving of the road would occur after construction is completed, sometime in early 2010.

- Certified weed-free straw wattles or silt fences would be used, as needed, to prevent sediment from disturbed areas from reaching seasonal wetlands and vernal pools during rain events. Straw wattles would be installed at the top of the PG&E access road embankment during repaving to prevent paving materials, sediment or other contaminants from reaching vernal pools. Straw wattles would be regularly inspected and maintained for the duration of construction or until the disturbed areas have been revegetated.

- No vehicles would be allowed to drive off of the existing PG&E access road west of the new bridge approach within 250 feet of vernal pools or other seasonal wetlands.

- No vehicles or personnel would be allowed within the wetland boundaries of the vernal pools.

Implementation of these avoidance and minimization measures and the purchase of mitigation credits would substantially reduce potential adverse effects to listed branchiopod species.

4.3.3 California Tiger Salamander

The presence of California tiger salamander within the project vicinity is unlikely. To further avoid potential adverse effects to the California tiger salamander, E&L Westcoast would implement the following avoidance and minimization measures during construction in annual grasslands within 0.7 mi of Site 4, (shown in Figures 1 and 2 of the Supplement to Biological Assessment [Appendix B]):

- Construction activities would be timed to occur during the dry season (non-breeding season for California tiger salamander) (April 15 to October 15) to minimize the potential for mortality of dispersing salamanders or other native amphibians.

- Prior to construction, a qualified biologist would conduct training sessions to familiarize all construction personnel with the following: identification of California tiger salamander, their habitat, general provisions and protections afforded by the ESA, measures implemented to protect the species, and a review of the project boundaries. This training would also be provided within 30 days of the arrival of any new worker.

- A biological monitor would be present during any ground-disturbing activities, and would examine any open excavations prior to the start of construction each morning. If a tiger salamander is observed it would be transported out of the project area by a USFWS-approved biologist with the appropriate permit and released into a suitable burrow or other refugia.

Implementation of these measures would further reduce the potential to affect the California tiger salamander.

4.3.4 Alkali Grassland

Alkali grassland habitat would be temporarily disturbed during construction of the Colusa Generating Station property line fence. This impact is not likely to adversely affect federal listed species because alkali grassland does not support special-status species and is not a jurisdictional wetland. However, the following measures are proposed to minimize potential impacts to alkali grassland habitat:

- Prior to construction, the limits of alkali grassland vegetation within the generating station property would be clearly marked by fencing. No work would be allowed within the marked alkali grassland habitat except as required to construct the property line fence.

4.3.5 Glenn-Colusa Canal, Tehama Colusa Canal, and Teresa Creek Revegetation

Revegetation of the project site at Teresa Creek, the Glenn-Colusa Canal, and surrounding areas would be implemented according to USFWS guidelines for restoration and/or replacement of giant garter snake habitat. Vegetation disturbed at Teresa Creek and the Glenn-Colusa Canal, and surrounding areas during the bridge replacements would be replanted with appropriate native species, such as California bulrush (*Scirpus californicus*), cattail (*Typha* spp.), and water primrose (*Ludwigia peploides*) in the emergent wetland area. Cover species on or adjacent to the creek bank would include creeping wild-rye (*Elymus*

triticoides), California blackberry (*Rubus vitifolius*) or wild grape (*Vitis californica*). Upland plantings would include a hydroseeding mix of species such as purple needle-grass (*Nassella pulchra*), annual fescue (*Vulpia* spp.), blue wildrye (*Elymus glaucus*), and California brome (*Bromus carinatus*). An erosion control mat would be laid down if stabilization of the bank is needed.

Vegetation disturbed at the Tehama-Colusa Canal would be replanted with appropriate native species, such as mugwort (*Artemisia douglasiana*), creeping wild rye (*Leymus triticoides*), and meadow barley (*Hordeum brachyantherum*).

The topography of the sites would be restored once proposed construction activities have been completed. New plantings would be monitored for one year or until the banks are adequately revegetated to prevent erosion and sedimentation of at these areas. Additional plantings would be implemented if adequate vegetation cover is not attained after one year. A monitoring report of the Tehama Colusa Canal, Glenn-Colusa Canal, and Teresa Creek would be submitted to the USFWS one year after restoration is implemented.

4.3.6 Upland Erosion Control and Revegetation

Revegetation of all other upland areas disturbed during construction would be subject to the following criteria.

4.3.6.1 Topsoil Salvage (Temporary Work Areas)

The upper 12 inches (topsoil) in temporary work areas would be excavated and stockpiled separately during grading for all temporary laydown areas, temporary access roads and other temporary work areas that would be revegetated following the completion of construction. Stockpiled topsoil would be reapplied to temporary work areas following construction and prior to implementation of revegetation measures described below.

4.3.6.2 Upland Erosion Control Seed Mix

Permanent erosion control for the construction laydown area and temporary access roads would consist of revegetation with a native erosion control seed mix equivalent to the following: California brome (*Bromus carinatus*) at 30 pounds of pure live seed per acre, small fescue (*Vulpia microstachys*) at 8 pounds of pure live seed per acre, and tomcat clover (*Trifolium wildenovii*) at 4 pounds of pure live seed per acre.

4.3.6.3 Performance Criteria for Upland Erosion Control Revegetation

A qualified biologist or erosion control specialist would evaluate the upland revegetation using the following performance criteria:

- Year 1 – 70 percent of vegetation cover measured at undisturbed reference sites adjacent to project site;
- Year 2 – 80 percent of vegetation cover measured at undisturbed reference sites adjacent to project site;
- Year 3 – 95 percent of vegetation cover measured at undisturbed reference sites adjacent to project area.

Erosion control would be considered successful if the following erosion thresholds are not exceeded:

- Flow Pattern Development – More than 25 percent of the area shows evidence of recent translocation and deposition of soil and litter.
- Rills – Usually greater than 3 inches deep and found at 10-foot intervals.
- Gullies – More frequent than 200-foot intervals and appear to be unstable.

If performance criteria for revegetation or erosion control are not met, remedial measures would be implemented as follows:

- Areas that do not meet revegetation criteria would be reseeded. If necessary, the erosion control seed mix may be modified to substitute other native species to improve success; and

- Temporary erosion control measures including silt fences, erosion control blankets, bio-logs, or straw bales would be installed as necessary to prevent ongoing erosion or sedimentation until remedial seeding measures can be fully implemented.

All erosion control measures would be monitored monthly during the wet season (approximately December 1 to April 1). Revegetation would be monitored each year for the first three years following project completion. Monitoring would be conducted by a USFWS-approved biologist.

5.0 REFERENCES

APLIC (Avian Power Line Interaction Committee). 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, CA.

Beamesderfer, R. C. P. and M. A. H. Webb. 2002 Green sturgeon status review information. S.P. Cramer and Associates, Gresham, Oregon.

Biosystems (Biosystems Analysis Inc.). 1994. Life on the Edge. Santa Cruz, California.

Busby, P. J., T. C. Wainwright, G. J. Bryant, L. J. Lierheimer, R. S. Waples, F. W. Waknitz, and I. V. Lagomarsino. 1996. Status review of west coast steelhead from Washington, Oregon, and California. NOAA Tech. Memo. NMFS-NWFSC-27.

CDFG (California Department of Fish and Game). 2000. Letter in regards to Biological Opinion 2090-1998-10-2 discussing the Glenn-Colusa Irrigation District Hamilton City Pumping Plant Fish Screen Improvement Project. Sacramento, CA. February 24, 2000.

CDFG (California Department of Fish and Game). 2007. Rarefind 3, an application allowing access to the California Natural Diversity Data Base. California Department of Fish and Game, Sacramento, CA. October 2007 version.

CNPS (California Native Plant Society). 2006. Inventory of Rare and Endangered Plants (online edition, v7-06b). California Native Plant Society. Sacramento, CA. Accessed on July 5, 2006 from http://www.cnps.org/inventory.

CEC (California Energy Commission). 2005. 2005 Integrated Energy Policy Report CEC-100-2005-007-ES. November.

Environmental Laboratory. 1987. Corps of Engineers Wetland Delineation Manual. Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Eriksen, C. H. and D. Belk. 1999. Fairy Shrimps of California's Puddles, Pools, and Playas. Mad River Press, Eureka, CA.

Federal Register. 1980. Listing the Valley Elderberry Longhorn Beetle as a Threatened Species with Critical Habitat. Vol. 45, No. 155. August 8.

Federal Register. 1992. Endangered and Threatened Wildlife and Plants; Determination of Critical Habitat for the Northern Spotted Owl; Final Rule. Vol. 57, No. 10. January 15.

Federal Register. 1993. Designated Critical Habitat; Sacramento River Winter-Run Chinook Salmon; Final Rule. June 16.

Federal Register. 1994a. Endangered and Threatened Wildlife and Plants; Critical Habitat Determination for the Delta Smelt. Vol. 59, No. 242. December 19.

Federal Register. 1994b. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Least Bell's Vireo. Vol. 59, No. 22. February 2.

Federal Register. 2005a. Endangered and Threatened Wildlife and Plants: Designation of Critical Habitat for Four Vernal Pool Crustaceans and Eleven Vernal Pool Plants in California and Southern Oregon; Evaluation of Economic Exclusions from August 2003 Final Designation; Final Rule. Vol. 70, No. 154. August 11.

Federal Register. 2005b. Endangered and Threatened Species; Designation of Critical Habitat for Seven Evolutionary Significant Units of Pacific Salmon and Steelhead in California; Final Rule. Vol. 70, No. 170. September 2.

Federal Register. 2006a. Endangered and Threatened Wildlife and Plants: Threatened Status for Southern Distinct Population Segment of North American Green Sturgeon. Vol. 71, No. 67 April 7.

Federal Register. 2006b. Endangered and Threatened Wildlife and Plants: Designation of Critical Habitat for Four Vernal Pool Crustaceans and Eleven Vernal Pool Plants; Final Rule. Vol. 71, No. 28. February 10.

Federal Register. 2007. Endangered and Threatened Wildlife and Plants; Adding Four Marine Taxa to the List of Endangered and Threatened Wildlife. Vol. 72, No. 64. April 4.

Hackney, S. 2006. Personal communication between Steve Hackney, Director of the Colusa County Planning and Building Department, and Melissa Newman of URS Corporation. September 15, 2006.

Healey, M. C. 1991. The life history of Chinook salmon (*Oncorhynchus tshawytscha*). *In* Pacific Salmon *Life Histories,* C. Groot and L. Margolis (eds.), pp. 311-393. Univ. B.C. Press, Vancouver, B.C.

Jameson Jr., E. W. and H. J. Peeters. 2004. California Mammals. University of California Press. Berkeley, California.

Jennings, M. R. 2006. Rana Resources. Personal communication between URS biologist Melissa Newman and Mark Jennings regarding the current range and potential presence of California red-legged frog and California tiger salamander in the Colusa Generating Station Project's biological study area. August 31, 2006.

Jennings, M. R. and Mark P. Hayes. 1994. Amphibian and Reptile Species of Concern in California. California Department of Fish and Game. Inland Fisheries Division. Rancho Cordova, CA. November 1, 1994.

McEwan, D. and T. A. Jackson. 1996. Steelhead Restoration and Management Plan for California. California Department of Fish and Game.

MHA Environmental Consulting. 2002. Final Environmental Impact Report for the Wild Goose Storage Expansion Project. Prepared for the Public Utilities Commission Energy Division. Application #01-06-029.

Moyle, P. B. 1976. Inland Fishes of California. University of California Press, Berkeley, California.

Moyle, P. B., B. Herbold, D. E. Stevens, and L. W. Miller. 1992. Life history and status of delta smelt in the Sacramento-San Joaquin Estuary, California. Trans. Amer. Fish. Soc. 121:67-77.

Moyle, P. B., R. M. Yoshiyama, J.E. Williams, and E. D. Wikramanayake. 1995. Fish Species of Special Concern in California. Second edition. Final report to California Department of Fish and Game, contract 2128IF.

NOAA (National Oceanic and Atmospheric Administration). 2006. On-line information on current Central Valley Chinook Salmon Habitat Distribution. Southwest Regional Office of NOAA. http://swr.nmfs.noaa.gov/hcd/dist2.htm. Accessed September 11, 2006.

NOP (Notice of Petition). 2001. Petition to list the North American Green Sturgeon (Acipenser medirostris) as an endangered or threatened species under the endangered species act. Petitioners: Environmental Protection Information Center; Center for Biological Diversity; Waterkeepers Northern California. June.

Silveira, Joe. 2001. Documented telephone conversation between URS biologist Jonathan Stead and Joe Silviera of the U.S. Fish and Wildlife Service – Sacramento National Wildlife Refuge regarding fairy shrimp occurrences.

Stone, R. D., W. B. Davilla, D. Taylor, G. Clifton, J. Stebbins, and BioSystems Analysis, Inc. 1988. Status Survey of the Grass Tribe Orcuttieae and Chamaesyce hooveri (Euphorbiaceae) in the Central Valley of California. Prepared for U.S. Fish and Wildlife Service, Office of Endangered Species, Sacramento, CA. Contract No. 14-16-0001-85115. September 1998.

USFWS (U.S. Fish and Wildlife Service). 1988. Recovery plan for upland species of the San Joaquin Valley, California. Region 1, Portland, OR. 319 pp.

USFWS (U.S. Fish and Wildlife Service). 1996. Programmatic Formal Endangered Species Act Consultation on Issuance of 404 Permits for Projects with Relatively Small Effects on Listed Vernal Pool Crustaceans Within the Jurisdiction of the Sacramento Field Office, California. February 28, 1996.

USFWS (U.S. Fish and Wildlife Service). 1997. Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo Counties, California. November 13, 1997.

USFWS (U.S. Fish and Wildlife Service). 1999. Draft Recovery Plan for the Giant Garter Snake (*Thamnopsis gigas*). Region 1.

USFWS (U.S. Fish and Wildlife Service). 2002. Recovery Plan for the California Red-legged Frog (*Rana aurora draytonii*). U.S. Fish and Wildlife Service, Portland, Oregon. September 12, 2002.

Wang, J. C. S. 1986. Fishes of the Sacramento-San Joaquin estuary and adjacent waters, California: A guide to the early life histories. Interagency Ecological Study Program for the Sacramento-San Joaquin Estuary. Tech. Rept. 9.

Wang, J. C. S. 1991. Early life stages and early life history of the delta smelt, *Hypomesus transpacificus*, in the Sacramento-San Joaquin estuary, with comparison of early life stages of the longfin smelt, *Spirinchus thaleichthys*. Interagency Ecological Studies Program for the Sacramento-San Joaquin Estuary. Tech. Rept. 28.

Zeiner, D. C., W. F. Laudenslayer, Jr., and K. E. Mayer. 1988. *California's Wildlife*, Volume I: Amphibians and Reptiles.

Zeiner, D. C., William F. Laudenslayer Jr., K. E. Mayer, and M. White. 1990. California's Wildlife Volume II: Mammals and Volume III: Birds. California Department of Fish and Game. Sacramento, CA.

RMP PEPM

Table 1
Estimated Land Disturbance Areas for Construction and Operation

Project Component Item	Unit Area		Proposed Length	Construction Right-of-Way (ROW)	Notes
	Construction	Operations			
Power Plant Area					
Power Generation Facility	20 acres	20 acres	N/A	N/A	Temporary construction includes laydown, topsoils storage, parking and construction office area, and construction area for switchyard. Permanent disturbance is the area within the fence line of the power generation facility, plus the stormwater detention basin.
Switchyard	8.2 acres	8.2 acres	N/A	N/A	Temporary construction area for switchyard is included with temporary construction area for power generation facility. Permanent disturbance is the area within the fenceline of the switchyard facility.
Stormwater Basin	2.5 acres	2.5 acres	N/A	N/A	Stormwater basin is located at the southwest section of the project site.
Temporary Construction Area					
Construction Area	43 acres	N/A	N/A	N/A	Temporary construction area includes laydown, parking, and construction trailer/office.
Linear Facilities					
Plant Access Road	4.1 acres	1.7 acres	2.500 feet	70-foot width	Temporary construction disturbance is 70 feet wide. Road length is approximately 2,500 feet from the end of pavement on the PG&E Road Easement 295 or 442 to the plant fenceline. Permanent disturbance is 30 feet wide (24-foot-wide pavement plus 3-foot shoulder on each side).

TEMP

Table 1
Estimated Land Disturbance Areas for Construction and Operation

Project Component Item	Unit Area		Proposed Length	Construction Right-of-Way (ROW)	Notes
	Construction	Operations			
Transmission Line Inter-connection	7.3 acres	0.3 acres	1.800 feet	10,000 square feet per tower (12) 400 square feet per footing (48)	Four PG&E transmission lines loop in and out from the site switchyard. They are approximately 1,800 feet long and each is supported by approximately three structures (a total of 48 tower footings). Thirty-two tower footings are outside of the temporary construction disturbance area of the switchyard and laydown area. Each tower footing would have a temporary disturbance averaging about 10,000 square feet per tower. Permanent average disturbance is estimated at 400 square feet per footing.
Natural Gas Pipeline, underground	1.7 acres	N/A	1,500 feet	50-foot width	No temporary or permanent access road. Construction disturbance would be 50 feet wide. Pipeline is approximately 1,500 feet in length (from PG&E Gas Compressor to termination at plant metering station fenceline). Permanent 50-foot easement, but surface restored to original condition.
Water Supply Pipeline and Associated Unpaved Road	1.9 acres	0.74 acres	2,700 feet	30-foot width	Temporary disturbance is assumed to be 30 feet wide. Pipeline is approximately 2,700 feet in length. The raw water intake structure at the Tehama-Colusa Canal would require a permanent area of 10 by 10 feet, and a temporary area of disturbance of twice that area. The surface above the buried pipeline would be maintained as a 12-foot-wide unpaved dirt service road, with the remaining area of disturbance.

Table 1
Estimated Land Disturbance Areas for Construction and Operation

Project Component Item	Unit Area		Proposed Length	Construction Right-of-Way (ROW)	Notes
	Construction	Operations			
Other Areas					
Glenn-Colusa Canal Bridge	4.1 acres	1.6 acres	100-feet	30-foot width	Maximum temporary disturbance is assumed to be a 1-acre parcel, which includes the construction laydown, temporary road, bridge and parking, and 135-foot ROW during construction of the road. Maximum permanent disturbance is limited to the realignment of the approach roads and backfilling the area (70 by 500 feet) on both sides of the bridge.
Teresa Creek Bridge	3 acres	0.04 acres	75 feet	200-foot radius	Maximum temporary disturbance is assumed to be within a 200-foot radius, which includes laydown, temporary road, and bridge and parking. Maximum permanent disturbance is limited to backfilling the 40 × 40-foot area at the northwestern corner of the bridge to bring it up to grade.
Delevan/ McDermott Intersection	0.02 acres	0.02 acres	N/A	N/A	Shoulders on Delevan Road east of McDermott Road would be widened at the intersection to provide a wider turning radius. This includes relocation of the stop sign and telephone conduit box at the northeastern corner, and placement of gravel at the northeastern and southeastern corners of the intersection.
TOTAL	**95.82 acres**	**35.1 acres**			

Table 2
Construction Work Windows for Federally Listed Species

Activity/Location	Species/Habitat	Timing of Work	J	F	M	A	M	J	J	A	S	O	N	D
General Construction: Teresa Creek Bridge, Glenn-Colusa Canal Bridge and road alignment, Delevan Road/McDermott Road intersection widening (Figures 3 and 4)	GGS	May 1 to October 1					▒	▒	▒	▒	▒			
Non-ground disturbing work within 250 feet of vernal pools: Transmission line interconnection, paving of PG&E access road (Figures 2 and 5)	Listed branchiopod; vernal pools	May 1 to October 15					▒	▒	▒	▒	▒	▒		
Construction activities in annual grasslands within 0.7 mi of aquatic habitats suitable for breeding CTS: Near the proposed power plant site (Figure 2)	CTS	April 15 to October 15					▒	▒	▒	▒	▒	▒		
Construction activities within 0.25 mile of potential active raptor nests: All project components	Raptors	August 16 to February 14 (non-breeding season) – preferred	▒	▒	■	■	■	■	■	■	▒	▒	▒	▒
Construction activities within 150 feet of active nests by birds protected by the MBTA: All project components	Birds protected by the MBTA	August 16 to February 14 (non-breeding season) – preferred	▒	▒	■	■	■	■	■	■	▒	▒	▒	▒

CTS = California tiger salamander
GGS = giant garter snake
MBTA = Federal Migratory Bird Treat Act

▒ Construction work would be conducted during the shaded periods.

■ Conduct surveys for active nests. If absent, work can proceed.

Table 3
Federal Threatened, Endangered, Proposed, or Candidate Species that May Occur Within the Colusa Generating Station Project Vicinity

Scientific Name Common Name	Federal Status[1]	State Status[2]	CNPS[3]	Preferred Habitat	Likelihood That Species May Occur In Project Site
Plants					
Chamaesyce hooveri Hoover's spurge	T	None	1B.2	This annual herb is known to occur in vernally flooded conditions in vernal-pool habitats. It blooms from July to August and occurs at elevations from 82 to 820 feet.	Potential to occur; suitable habitat on site. There are three documented occurrences of this species within the project vicinity (CDFG, 2007).
Cordylanthus palmatus palmate-bracted bird's beak	E	E	1B.1	This annual parasitic herb is known to occur in chenopod scrub and alkaline valley and foothill grassland. This species blooms from May till October at elevations from 16 to 508 feet. Plants in Glenn County are introduced.	Potential to occur; suitable habitat on site. There are nine documented occurrences of this species within the project vicinity (CDFG, 2007).
Neostapfia colusana Colusa grass	T	E	1B.I	This annual herb is known to occur in large, deep vernal pools with adobe soils. It blooms from May to August. Occurs at elevations between 16 to 660 feet.	Not likely to occur; presumed by CNPS to be extirpated in area. There is one documented occurrence of this species within the project vicinity from 1898 (CDFG, 2007).
Orcuttia pilosa hairy Orcutt grass	E	E	1B.1	This annual herb is known to occur in vernal pools, endemic to the Sacramento Valley at elevations between 82 and 410 feet. Blooms from May to September.	Potential to occur; suitable habitat on site. There are six documented occurrences of this species within the project vicinity (CDFG, 2007).
Birds					
Coccyzus americanus occidentalis Western yellow-billed cuckoo	C	E	N/A	Riparian forest nester, along the broad, lower flood bottoms of larger river systems, nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.	Not likely to occur; there is no suitable habitat (riparian thickets) in the project site. There are ten documented occurrences of this species within the project vicinity (CDFG, 2007).
Strix occidentalis caurina northern spotted owl	T	None	N/A	Found in old growth forest with a moderate to high canopy closure; multi-layered, multi-species canopy with large overstory trees.	Not likely to occur; no suitable habitat. There are no documented occurrences of this species within the project vicinity (CDFG, 2007).

Table 3
Federal Threatened, Endangered, Proposed, or Candidate Species that May Occur Within the Colusa Generating Station Project Vicinity

Vireo bellii pusillus least Bell's vireo	E	E	N/A	Nests and forages in willow scrub vegetation. The vireo has been extirpated from northern California.	Not likely to occur; no suitable habitat (no riparian thickets.) There are no documented occurrences of this species within the project vicinity (CDFG, 2007). This species has been observed in the Sacramento National Wildlife Refuge approximately 6 miles from the project site. Least bell's vireo was not on any other special status species lists in the 11 quad review area.
Reptiles					
Thamnophis gigas giant garter snake	T	T	N/A	This species is one of the most aquatic garter snakes and is usually found in areas of freshwater marsh and low-gradient streams. Prefers freshwater marsh and low gradient streams, has adapted to drainage canals and irrigation ditches.	Potential to occur; presence assumed in most irrigation canals and rice fields. There are 21 documented occurrences of this species within the project vicinity (CDFG, 2007). Two of the occurrences are in the project site's quadrangle (Maxwell).
Amphibians					
Ambystoma californiense California tiger salamander	T	SSC	N/A	This species occurs in annual grasslands and grassy understory of valley-foothill hardwood habitats, need underground refuges during dry season, need vernal pools or other seasonal water sources for breeding. The known elevational range of this species extends from 10 to 3,460 feet.	Not likely to occur. Marginal suitable habitat is available in the project site and vicinity, but the project site is at the edge of the documented range of this species. Populations of this species in the project vicinity are scattered and few (Jennings, 2006). There is one documented occurrence of this species within the project vicinity (CDFG, 2007), although this occurrence is now extirpated according to the CDFG.

Table 3
Federal Threatened, Endangered, Proposed, or Candidate Species that May Occur Within the Colusa Generating Station Project Vicinity

Rana aurora draytonii California red-legged frog	T	SSC	N/A	Habitat of California red-legged frogs is characterized by dense, shrubby riparian vegetation associated with deep (28 inches), still or slow-moving water. The shrubby riparian vegetation that structurally seems to be most suitable for California red-legged frogs is that provided by *Salix lasiolepis*; *Typha* sp. and bulrushes also provide suitable habitat. Although California red-legged frogs can occur in ephemeral or permanent streams or ponds, populations probably cannot be maintained in ephemeral streams in which surface water levels do not decrease. Water should have a salinity of 4.5 pH to ensure the survival of embryonic stages. Juvenile frogs seem to favor open, shallow aquatic habitats with dense submergents. Breeds in pools with emergent vegetation; typically absent in pools where predatory fish are present; require adequate hibernacula such as small mammal burrows and moist leaf litter.	Not likely to occur. Marginal suitable habitat is available in the project site and vicinity, but the species is unlikely to be in the project vicinity (Jennings, 2006). There are no documented occurrences of this species within the project vicinity (CDFG, 2007).
Fish					
Hypomesus transpacificus Delta smelt	T	T	N/A	Occurs in the low-mid reaches of San Joaquin-Sacramento Delta.	Not likely to occur; no suitable habitat. There are no documented occurrences of this species within the project vicinity (CDFG, 2007).
Oncorhynchus mykiss Central Valley steelhead	T, CH	None	N/A	Occurs in the Pacific Ocean and spawns in coastal streams and rivers, over gravel beds.	Potential to occur; observed in project site. There are no documented occurrences of this species within the project vicinity (CDFG, 2007).

Table 3
Federal Threatened, Endangered, Proposed, or Candidate Species that May Occur Within the Colusa Generating Station Project Vicinity

Oncorhynchus tshawytscha Central Valley spring-run Chinook salmon	T, CH	T	N/A	This species is found in the Pacific Ocean and spawns in large, permanent coastal streams and rivers, over gravel beds. Spring-run Chinook salmon are primarily found in four tributaries of the Sacramento River: Butte, Big Chico, Deer, and Mill creeks. Spring-run Chinook salmon enter the Sacramento River between February and June. They move upstream and enter tributary streams from February through July, peaking in May-June. These fish migrate into the headwaters, hold in pools until they spawn, starting as early as mid-August and ending in mid-October, peaking in September. The juvenile life history is more variable.	Potential to occur; suitable habitat in Teresa Creek. There are no documented occurrences of this species within the project vicinity (CDFG, 2007).
Oncorhynchus tshawytscha winter-run Chinook salmon, Sacramento River	T, CH	E	N/A	This species is found in the Pacific Ocean and spawns in large, permanent coastal streams and rivers, over gravel beds. It returns to the upper Sacramento River in the winter but delays spawning until the spring and summer. Juveniles spend 5 to 9 months in the river and Sacramento-San Joaquin Estuary before entering the ocean.	Potential to occur; suitable habitat in Teresa Creek. There are no documented occurrences of this species within the project vicinity (CDFG, 2007).
Invertebrates					
Branchinecta conservatio conservancy fairy shrimp	E	None	N/A	Found in large, turbid pools in the northern two-thirds of the Central Valley; inhabit astatic pools located in swales formed by old, braided alluvium, filled by winter/spring rains, last until June.	Potential to occur; suitable habitat on site. There is one documented occurrence of this species within the project vicinity (CDFG, 2007).

Table 3
Federal Threatened, Endangered, Proposed, or Candidate Species that May Occur Within the Colusa Generating Station Project Vicinity

Branchinecta lynchi vernal pool fairy shrimp	T	None	N/A	The vernal pool fairy shrimp is currently known to occur in a wide range of vernal pool habitats in the southern and Central Valley areas of California, and in two vernal pool habitats within the "Agate Desert" area of Jackson County, Oregon. The vernal pool fairy shrimp occupies a variety of different vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools. Although the species has been collected from large vernal pools, including one exceeding 25 acres, it tends to occur in smaller pools. It is most frequently found in pools measuring less than 0.05 acre.	Potential to occur; suitable habitat onsite. There are no documented occurrences of this species within the project vicinity (CDFG, 2007).
Desmocerus californicus dimorphus Valley elderberry longhorn beetle	T	None	N/A	The species is nearly always found on or close to its host plant, elderberry (*Sambucus* species). In order to serve as habitat, the shrubs must have stems that are 1.0 inch or greater in diameter at ground level. Use of the plants by the animal is rarely apparent. Frequently, the only exterior evidence of the shrub's use by the beetle is an exit hole created by the larva just before the pupal stage. Adults are active from March to June, feeding and mating.	Not likely to occur; no elderberry shrubs on site. There are seven documented occurrences of this species within the project vicinity (CDFG, 2007).
Lepidurus packardi vernal pool tadpole shrimp	E, CH	None	N/A	Inhabits seasonal pools in unplowed grassland with old alluvial soils underlain by hardpan or in sandstone depressions, water in the pools has very low alkalinity and conductivity.	Potential to occur; suitable habitat on site. No critical habitat within the project site. There are two documented occurrences of this species within the project vicinity (CDFG, 2007).

Table 3
Federal Threatened, Endangered, Proposed, or Candidate Species that May Occur Within the Colusa Generating Station Project Vicinity

[1]Federal and Endangered Species Act
- CH Critical Habitat
- E Endangered
- T Threatened
- C Candidate for listing status
- D Delisted
- PD Proposed for delisting

[2] California Endangered Species Act
- SSC California Department of Fish and Game Species of Special Concern
- FP Species which cannot be taken or possessed without a permit from the Fish and Game Commission and/or Department of Fish and Game
- R Rare
- E Endangered
- T Threatened
- C Candidate for listing status
- D Delisted
- PD Proposed for delisting

[3] California Native Plant Society (CNPS)
- 1A Plant species that are presumed extinct in California
- 1B Plant species that are rare, threatened, or endangered in California and elsewhere
- 2 Plant species that are rare, threatened, or endangered in California but more common elsewhere
- 3 Plant species about which we need more information (a review list)

Suffixes indicating plant species of limited distribution (a watch list)
- .1 Seriously endangered in California
- .2 Fairly endangered
- .3 Not very endangered in California

[4]High Priority species are designated by the Western Bat Working Group as a species imperiled, or at a high risk of imperilment.

*Preferred Habitat information complied from the CNDDB, CDFG, and CNPS websites (http://www.dfg.ca.gov/hcpb/species/search_species.shtml; http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi).

Table 4
Biological Resources Field Surveys

Resource	Field Surveys Completed	Conducted by URS Biologists
Potential jurisdictional wetlands	Wetland delineations conducted on March 26 and 27, April 9 and 10, 2001, July 26, 2001, and August 24, September 22, October 10, 2006 and March 9, 14, and 21, 2007	Steve Leach, Corinna Lu, Jennifer Pretare, Michelle Lee, Jonathan Stead, Lorena Solorzano-Vincent, Justin Whitfield, Melissa Newman, Jan Novak
Rare plants	Surveys conducted on March 26 and 27, April 23, and May 11, 2001 and April 5, and August 24, September 22, October 10, 2006 and March 9, 14, and 21, 2007	Steve Leach, Corinna Lu, Michelle Lee, Jonathan Stead, Justin Whitfield, Dina Robertson, Lorena Solorzano-Vincent, Melissa Newman, Jan Novak
Swainson's hawk	Review of CNDDB confirms active nest sites within 5 miles of plant site; surveys for nesting hawks within 1 mile of the plant site conducted on April 24, 2001	Michelle Lee, Corinna Lu
Branchiopod species	Habitat suitability evaluated and location of potentially affected habitat established by GPS on March 9, 11, 26, and 27, 2001 and March 9 and 21, 2007	Jonathan Stead, Steve Leach, Jan Novak, Melissa Newman
Burrowing owl	Habitat suitability evaluated/active burrows noted March 9, 26, and 27, May 10, 11 and April 24, 2001 and August 24 and October 10 2006	Jonathan Stead, Corinna Lu, Michelle Lee, Steve Leach, Lorena Solorzano-Vincent, Justin Whitfield, Melissa Newman
California tiger salamander preliminary habitat assessment	March 21 and April 19, 2007	Melissa Newman and Derek Jansen
Other wildlife species	Habitat suitability evaluated March 9, 26, and 27, 2001 and August 24, 2006	Jonathan Stead, Corinna Lu, Steve Leach, Lorena Solorzano-Vincent, Justin Whitfield, Melissa Newman

Table 5
Plant Species Observed in the Project Site and Immediate Vicinity in 2001

Scientific Name	Common Name	Habitat Type				
		Grassland	Seasonal Wetlands	Vernal Pool	Ruderal	Agricultural Ditch
Achyrachaena mollis	blow-wives	X	X			
Aegilops triuncialis	barbed goatgrass	X*				
Amsinckia menziesii	rancher's fireweed	X			X	
Atriplex fruticulosa	saltbush	X*				
Avena barbata	slender wild oat	X				
Avena fatua	wild oat				X	
Brassica nigra	black mustard	X			X	
Bromus diandrus	ripgut grass	X			X	
Bromus hordeaceus	soft chess	X				
Calandrinia ciliata	red maids	X				
Callitriche marginata	water-starwort			X		
Capsella bursa-pastoris	shepherd's purse	X			X	
Carex sp.	sedge		X(sp)			
Centaurea solstitialis	yellow star thistle	X			X	
Cerastium arvense	field chickweed	X			X	
Chamomilla suaveolens	pineapple weed				X	
Convolvulus arvensis	bindweed	X			X	
Crassula sp.	pygmy weed	X*				
Cressa truxillensis	alkali weed	X*				
Cynodon dactylon	bermuda grass				X	
Cyperus eragrostis	nutsedge					X
Deschampsia danthonioides	annual hairgrass			X		
Dichelostemma capitatum	blue dicks	X				
Distichlis spicata	saltgrass		X		X	
Downingia insignis	harlequin downingia			X		
Eleocharis macrostachya	spikerush		X			

Table 5
Plant Species Observed in the Project Site and Immediate Vicinity in 2001

Scientific Name	Common Name	Habitat Type				
		Grassland	Seasonal Wetlands	Vernal Pool	Ruderal	Agricultural Ditch
Epilobium brachycarpum	willow herb				X	
Erodium botrys	filaree	X*	X			
Erodium moschatum	filaree	X			X	
Eryngium vaseyi	coyote thistle			X		
Escholzia californica	California poppy				X	
Euthamia occidentalis	western goldentop		X			
Frankenia salina	alkali heath				X	
Geranium dissectum	geranium	X	X		X	
Glyceria occidentalis	mannagrass		X			
Gnaphalium palustre	cudweed					X
Gratiola heterosepala	hedge-hyssop			X		
Grindelia camporum	gumplant	X				
Hemizonia fitchii	hemizonia	X				
Hordeum hystrix	Mediterranean barley		X			
Hordeum murinum ssp. *leporinum*	foxtail barley	X			X	
Juncus (pacificus)	rush					X
Juncus bufonius	toad rush			X		
Lactuca serriola	prickly lettuce				X	
Lactuca sp.	wild lettuce		X(sp)			
Lasthenia fremontii	goldfields			X		
Lepidium latipes	peppergrass		X			
Lepidium latipes var. *latipes*	dwarf peppergrass	X				
Lepidium nitidum	peppergrass		X			
Leymus triticoides	creeping wild-rye				X	
Lilaea scilloides	flowering-quillwort			X		
Limnanthes douglasii	meadowfoam			X		

Table 5
Plant Species Observed in the Project Site and Immediate Vicinity in 2001

Scientific Name	Common Name	Habitat Type				
		Grassland	Seasonal Wetlands	Vernal Pool	Ruderal	Agricultural Ditch
Lolium multiflorum	Italian ryegrass		X		X	
Lotus corniculatus	birdsfoot trefoil				X	
Ludwigia peploides	water primrose					X
Lupinus bicolor	miniature lupine				X	
Lupinus succulentus	arroyo lupine	X				
Leymus triticoides)	wildrye		X			
Lythrum hyssopifolium	hyssop loosestrife			X		
Malva sp.	mallow	X				
Marrubium vulgare	horehound				X	
Medicago polymorpha	burclover	X				
Medicago sativa	alfalfa				X	
Muilla maritima	common muilla	X				
Navarretia leucocephala	white-headed navarretia			X		
Paspalum dilatatum	dallies grass		X			
Picris echioides	ox-tongue		X		X	
Pilularia americana	pillwort			X		
Plagiabothrys greenei	popcornflower	X	X			
Plagiobothrys nothofulvus	popcornflower	X				
Plagiobothrys stipitatus ssp. *stipitatus*	popcornflower		X			
Plantago coronopus	cut-leaf plantain	X*	X			
Plantago elongata	plantain		X			
Poa annua	annual bluegrass		X			
Pogogyne zizyphoroides	Sacramento mesa mint			X		
Polygonum arenastrum	common knotweed				X	
Polygonum sp.	knotweed		X(sp)			

Table 5
Plant Species Observed in the Project Site and Immediate Vicinity in 2001

Scientific Name	Common Name	Habitat Type				
		Grassland	Seasonal Wetlands	Vernal Pool	Ruderal	Agricultural Ditch
Psilocarphus brevissimus	dwarf woolly-heads			X		
Rubus discolor	Himalayan blackberry				X	
Rumex crispus	curly dock				X	
Salix laevigata	red willow					X
Scirpus acutus	tule					X
Senecio vulgaris	groundsel				X	
Silybum marianum	milk thistle	X			X	
Sonchus oleraceous	common sow thistle				X	
Spergularia rubra	sand-spurry	X*				
Taeniatherum caput-medusae	Medusa-head	X				
Tillaea aquatica	Pygmy-weed			X		
Trifolium hirtum	rose clover	X*				
Triteleia laxa	Ithuriel's spear	X				
Typha latifolia	cattail					X
Verbena bonariensis	purpletop vervain				X	
Veronica peregrina ssp. *xalapensis*	purslane speedwell				X	
Vicia americana	American vetch	X			X	
Vulpia myuros	rattail fescue				X	

Note: SP = Stock pond;
* = Alkali grassland

Table 6
Plant Species Observed in the Project Site and Immediate Vicinity in 2006 and 2007

Scientific Name	Common Name	Family	Nativity
Achyrachaena mollis	blow-wives	Asteraceae	N
Amsinckia menziesii	small-flowered fiddleneck	Boraginaceae	N
Atriplex sp. 1	saltbush	Chenopodiaceae	N/A
Atriplex sp. 2	saltbush	Chenopodiaceae	N/A
Atriplex depressa	brittlescale	Chenopodiaceae	N
Brassica nigra	black mustard	Brassicaceae	NN
Bromus hordeaceus	soft chess brome	Poaceae	NN
Bromus madritensis	Madrid brome	Poaceae	NN
Capsella bursa-pastoris	shepherd's purse	Brassicaceae	NN
Castilleja sp.	paintbrush	Scrophulariaceae	N/A
Centaurea solstitialis	yellow star thistle	Asteraceae	NN
Cerastium arvense	field chickweed	Caryophyllaceae	N
Crypsis schoenoides	swamp pricklegrass	Poaceae	NN
Cynosurus echinatus	dogtail grass	Poaceae	NN
Daucus pusillus	rattlesnake weed	Apiaceae	N
Dichelostemma sp.	snakelily	Liliaceae	N
Eleocharis sp.	spikerush	Cyperaceae	N/A
Erodium botrys	broad-leaved filaree	Geraniaceae	NN
Erodium cicutarium	redstem filaree	Geraniaceae	NN
Eryngium sp.	button celery	Apiaceae	N
Eryngium vaseyi	coyote thistle	Apiaceae	N
Geranium dissectum	cutleaf geranium	Geraniaceae	NN
Grindelia camporum	gumweed	Asteraceae	N
Hemizonia congesta ssp. *congesta*	hayfield tarweed	Asteraceae	N
Hemizonia parryi	Parry spikeweed	Asteraceae	N
Hirschfeldia incana	shortpod mustard	Brassicaceae	NN
Hordeum sp.	barley	Poaceae	N/A
Hordeum marinum	seaside barley	Poaceae	NN
Hordeum murinum	mouse barley	Poaceae	NN

Table 6
Plant Species Observed in the Project Site and Immediate Vicinity in 2006 and 2007

Scientific Name	Common Name	Family	Nativity
Hypochaeris glabra	smooth catsear	Asteraceae	NN
Lactuca serriola	prickly lettuce	Asteraceae	NN
Lepidium latipes var. *latipes*	San Diego pepperweed	Brassicaceae	N
Lepidium nitidum	shining pepperweed	Brassicaceae	N
Lolium perenne	perennial ryegrass	Poaceae	NN
Lolium sp.	ryegrass	Poaceae	NN
Lythrum sp.	loosestrife	Lythraceae	N/A
Matricaria discoidea	disc mayweed	Asteraceae	NN
Medicago polymorpha	burclover	Fabaceae	NN
Microseris sp.	cottonseed	Asteraceae	N
Navarretia sp.	pincushionplant	Polemoniaceae	N
Plantago elongata	prairie plantain	Plantaginaceae	N
Plagiobothrys stipitatus sp. *micranthus*	vernal pool popcorn flower	Boraginaceae	N
Poa annua	annual bluegrass	Poaceae	NN
Polygonum sp.	smartweed	Polygonaceae	N/A
Polypogon monspeliensis	rabbitsfoot grass	Poaceae	NN
Psilocarphus sp.	woolly marbles	Asteraceae	N
Rumex crispus	curly dock	Polygonaceae	NN
Scirpus acutus	bulrush	Cyperaceae	N
Senecio vulgaris	old-man-in-the-Spring	Asteraceae	NN
Silybum marianum	blessed milkthistle	Asteraceae	NN
Taeniatherum caput-medusae	medusa head	Poaceae	NN
Trifolium sp.	clover	Fabaceae	N/A
Triphysaria eriantha	johnny-tuck	Scrophulariaceae	N
Typha latifolia	broad-leaf cattail	Typhaceae	N
Vicia sp.	vetch	Fabaceae	N/A
Vulpia sp.	fescue	Poaceae	N/A

N = Native
N/A = Not applicable
NN = Non-Native

Table 7
Animal Species Observed in the Project Site and Immediate Vicinity

Scientific Name	Common Name
Agelaius phoeniceus	red-winged blackbird
Anas platyrhynchos (nesting)	mallard
Antilocupra americana	pronghorn antelope
Athene cuniculario hypugea	burrowing owl
Botaurus lentiginosus	American bittern
Buteo jamaicensis	red-tailed hawk
Butorides virescens	green heron
Canis latrans	coyote
Carduelis psaltria	lesser goldfinch
Cathartes aura	turkey vulture
Charadrius vociferus	killdeer
Circus cyaneus	northern harrier
Corvus brachyrhynchos	American crow
Cyzicus californicus	clam shrimp
Didelphis virginiana	Virginia opossum
Egretta thula	snowy egret
Eremophila alpestris	horned lark
Euphagus cyanocephalus	Brewer's blackbird
Fulica americana	American coot
Himantopus mexicanus	black-necked stilt
Hirundo pyrrhonota	cliff swallow
Hylla regilla	Pacific tree frog
Icterus cucullatus	hooded oriole
Lepus californicus	black-tailed jackrabbit
Microtus sp.	vole
Mimus polyglottos	northern mockingbird
Onchorhynchus mykiss	adult steelhead
Passer domesticus	house sparrow
Passerculus sandwichensis	savannah sparrow
Phasianus colchicus	ring-necked pheasant
Pica nuttalli	yellow-billed magpie

Table 7
Animal Species Observed in the Project Site and Immediate Vicinity

Scientific Name	Common Name
Pituophis melanoleucus	gopher snake
Plegadis chihi	white-faced ibis
Procyon lotor	raccoon
Rana catesbeiana	bullfrog
Sayornis nigricans	black phoebe
Sceloporus occidentalis	western fence lizard
Sorex sp.	shrew
Sturnella neglecta (nesting)	western meadowlark
Tyrannus verticalis	western kingbird
Zenaida macroura	mourning dove

Table 8

Impacts and Compensatory Mitigation for Giant Garter Snake Habitat

Habitat Impacted	Area of Impact (acres)	Proposed Mitigation Ratio[1]	Proposed Mitigation
Permanent Impacts			
freshwater marsh (FM)	FM-2 = 0.001		
	FM-7 = 0.042		
	FM-8 = 0.031		
	FM-9 = 0.135		
	FM-10 = 0.071		
total freshwater marsh	**0.279**	**3:1**	**0.837 acre[2]**
cultivated rice field (RF)	RF- 1 = 0.096		
	RF-3 = 0.266		
	RF-4 = 0		
total cultivated rice field	**0.362**	**3:1**	**1.086 acre[2]**
total irrigation ditch (ID)	**0**	**3:1**	**0 acre[2]**
total GCID Canal (C)	**C-1 = 0.029[3]**	**3:1**	**0.087 acre[2]**
total perennial stream (Teresa Creek) (TCK)	**TCK-1 = 0.014**	**3:1**	**0.042 acre[2]**
TOTAL AQUATIC HABITAT AREA	~~0.684~~		**2.052-acre aquatic habitat and 4.104 upland habitat[4]**
Temporary Impacts			
freshwater marsh	FM-2 = 0.021		
	FM-7 = 0.017		
	FM-8 = 0.015		
	FM-9 = 0.055		
	FM-10 = 0.012		
total freshwater marsh	**0.120**	**1:1**	**Onsite restoration of affected area[2]**
cultivated rice field	RF- 1 = 0.463		
	RF-3 = 0.824		
	RF-4 = 0.114		
total cultivated rice field	**1.401**	**1:1**	**Onsite restoration of affected area[2]**
total irrigation ditch	**ID -1 = 0.214**	**1:1**	**Onsite restoration of affected area[2]**
GCID Canal	C-2 = 0.004		
	C-3 = 0.004		

Table 8

Impacts and Compensatory Mitigation for Giant Garter Snake Habitat

Habitat Impacted	Area of Impact (acres)	Proposed Mitigation Ratio[1]	Proposed Mitigation
	C-4 = 0.004		
	C-5 = 0.009		
	C-6 =0.011		
total GCID Canal	**0.032**	**1:1**	**Onsite restoration of affected area[2]**
total perennial stream (Teresa Creek)	**TCK-2 =0.040**	**1:1**	**Onsite restoration of affected area[2]**
seasonal wetland	SW-3 = 0.012		
	SW-4 =0.011		
total seasonal wetland	**0.023**	**1:1**	**Onsite restoration of affected area[2]**
TOTAL AQUATIC HABITAT AREA	**1.83**	**1:1**	**Onsite restoration of affected area[2]**

[1] Mitigation would be provided that is consistent with the USFWS Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo Counties, California. November 13, 1997.

[2] Resulting mitigation would be the greater amount for either impacts to giant garter snake habitat or jurisdictional wetlands, but not both.

[3] Feature "C-1" includes the two sets of five piers proposed to be placed into the Glenn-Colusa Irrigation District Canal.

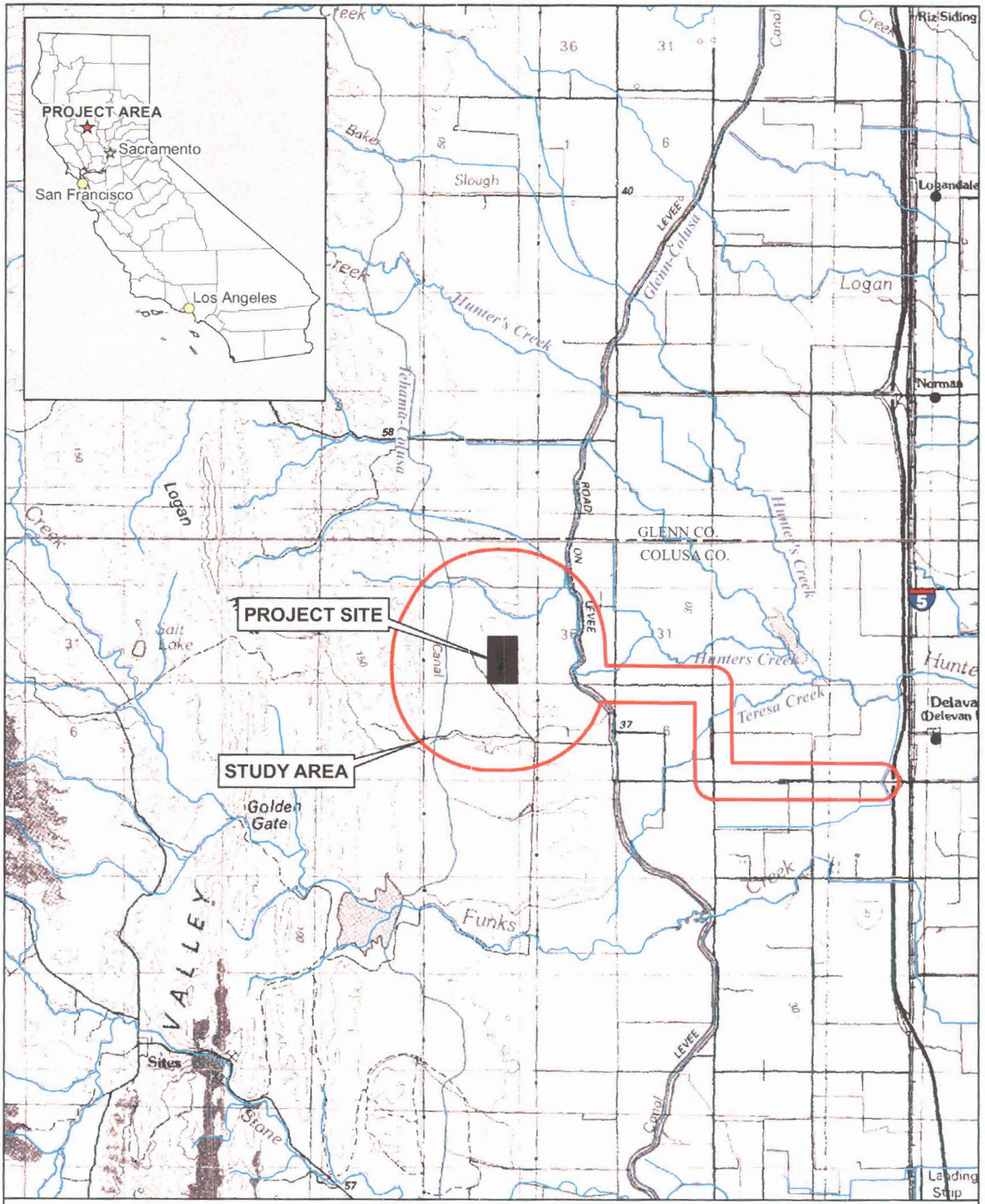
[4] Proposed compensation would include offsite replacement of 2 acres of upland habitat for each acre of aquatic habitat replaced (USFWS, 1997).

Table 9
Proposed Compensatory Mitigation for Listed Branchiopod Habitat Following USFWS' 1996 Vernal Pool Programmatic Consultation

Habitat	Direct Permanent Area of Impact (acres)	Total Area of Affected Wetland (acres)	Proposed Mitigation Ratio		Type of Mitigation
			Preservation 2:1	Creation 1:1	
Seasonal Wetland, SW-1	0.005	0.113[1]	0.226	0.113	Off-site at a USFWS- approved mitigation bank
Seasonal Wetland, SW-2	0.013	0.041[1]	0.082	0.041	Off-site at a USFWS-approved mitigation bank
Total (acres)	0.018	0.154	0.308[2]	0.154[2]	

[1]The USFWS programmatic consultation with the ACOE requires compensation to be based on the entire area of the affected pool rather than the area of fill or temporary disturbance (USFWS 1996).

[2] Compensatory mitigation for impacts to seasonal wetlands would be the greater amount for either impacts to listed branchiopod habitat or jurisdictional wetlands, but not both.



PROJECT VICINITY MAP

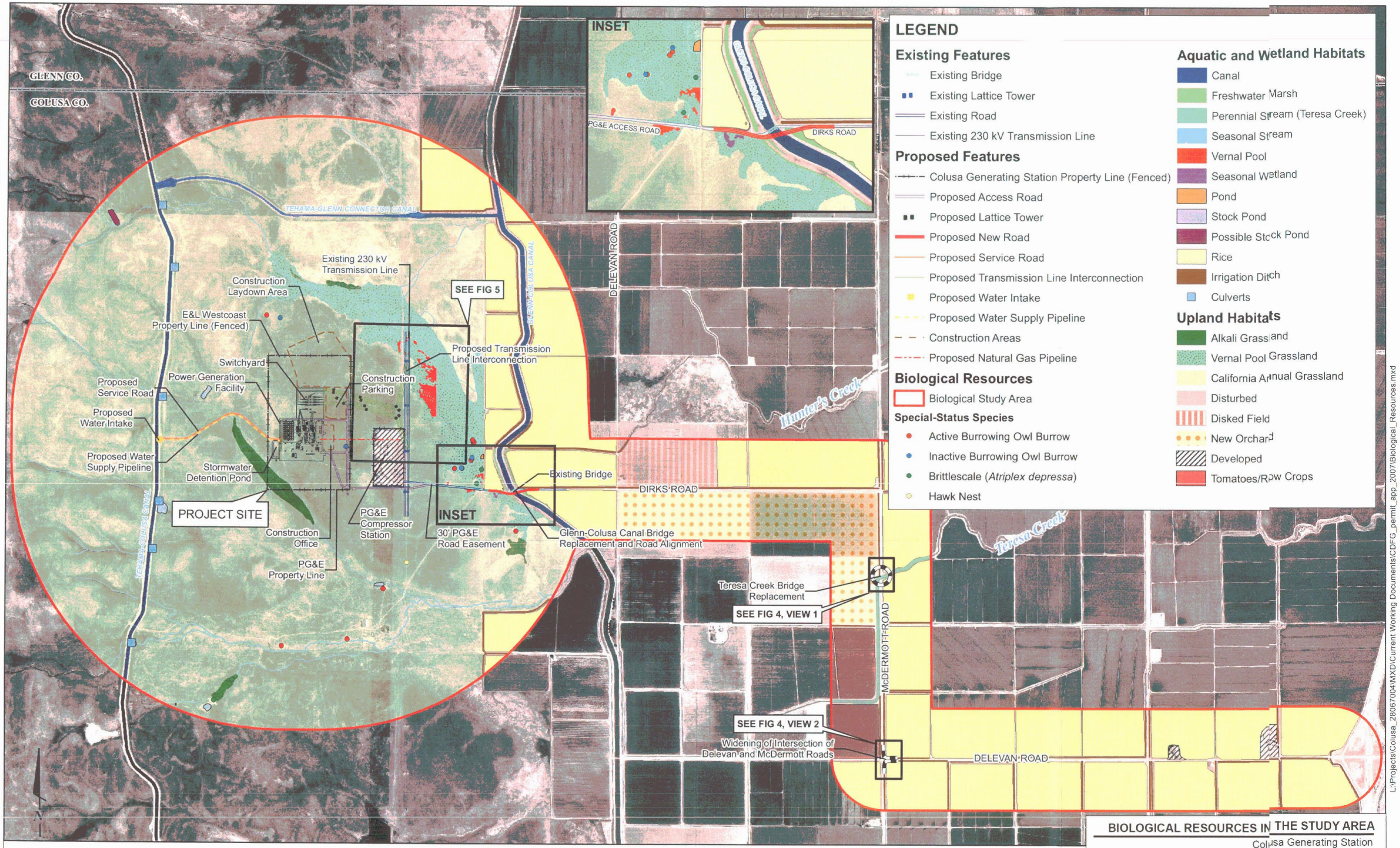
Colusa Generating Station
28067004 E&L Westcoast, LLC
October 2007 Colusa County, California

URS

FIGURE 1

4/03/07 vsa ..T:\28067004 CPV Colusa 2007\Jursidictional Delineation\figure_1_pvm_apr07.ai

URS Corporation L:\Projects\Colusa_28067004\MXD\Current Working Documents\Colusa_Permitting\figure_1.mxd Date: 11/30/2006 1:26:03 PM Name: smlewis0



LEGEND

Existing Features
- Existing Bridge
- Existing Lattice Tower
- Existing Road
- Existing 230 kV Transmission Line

Proposed Features
- Colusa Generating Station Property Line (Fenced)
- Proposed Access Road
- Proposed Lattice Tower
- Proposed New Road
- Proposed Service Road
- Proposed Transmission Line Interconnection
- Proposed Water Intake
- Proposed Water Supply Pipeline
- Construction Areas
- Proposed Natural Gas Pipeline

Biological Resources
- Biological Study Area

Special-Status Species
- Active Burrowing Owl Burrow
- Inactive Burrowing Owl Burrow
- Brittlescale (*Atriplex depressa*)
- Hawk Nest

Aquatic and Wetland Habitats
- Canal
- Freshwater Marsh
- Perennial Stream (Teresa Creek)
- Seasonal Stream
- Vernal Pool
- Seasonal Wetland
- Pond
- Stock Pond
- Possible Stock Pond
- Rice
- Irrigation Ditch
- Culverts

Upland Habitats
- Alkali Grassland
- Vernal Pool Grassland
- California Annual Grassland
- Disturbed
- Disked Field
- New Orchard
- Developed
- Tomatoes/Row Crops

Source: USGS Seamless Dataset, B/W DOQQ Photo, Aug. 25, 98; Sept. 13, 98; July 29, 99

0 0.25 0.5 1 1.5

Scale in Miles

BIOLOGICAL RESOURCES IN THE STUDY AREA

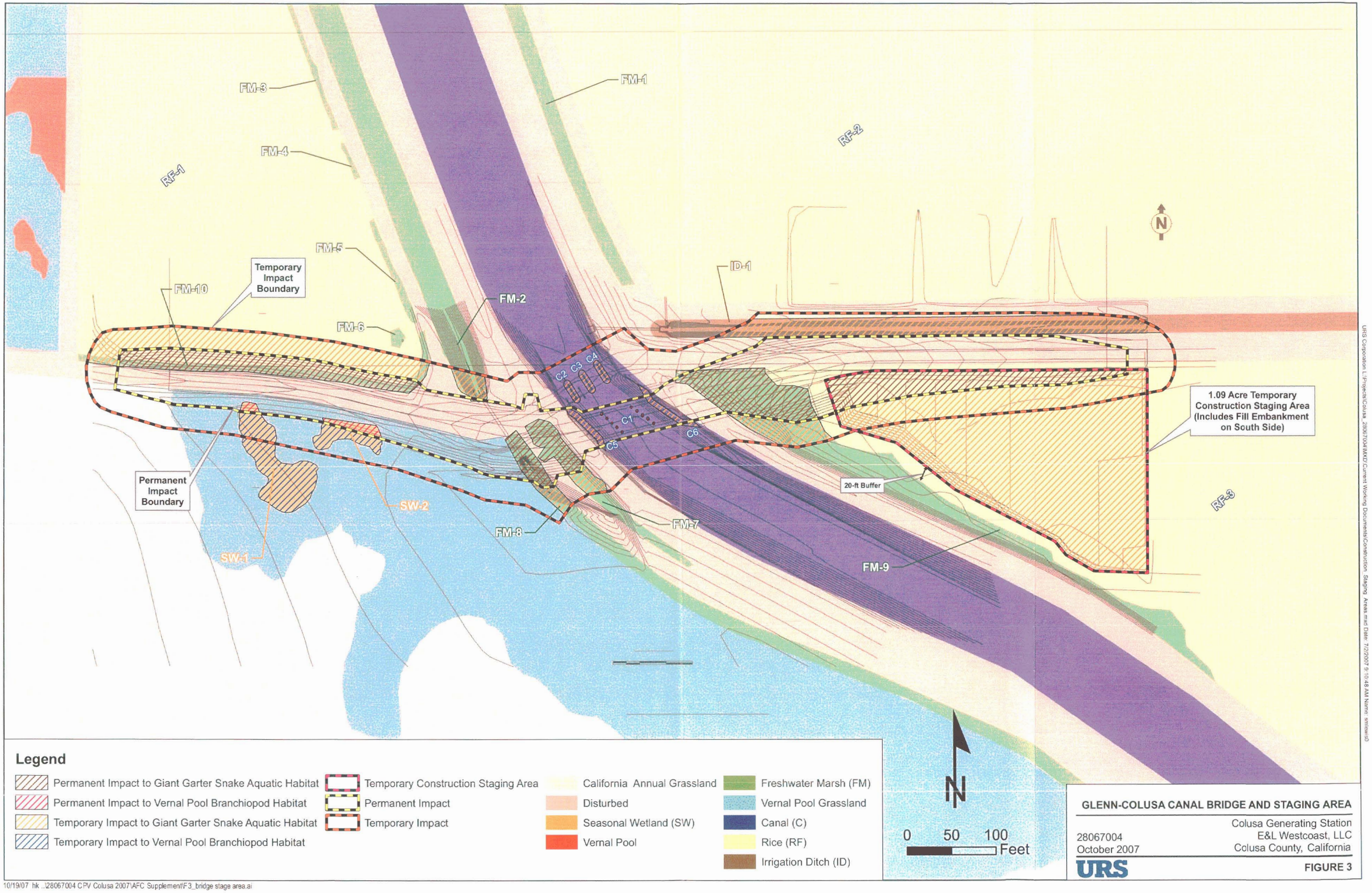
Colusa Generating Station
E&L Westcoast, LLC
Colusa County, California

28067004
October 2007

URS

FIGURE 2

L:\Projects\Colusa_28067004\MXD\Current Working Documents\CDFG_permit_app_2007\Biological_Resources.mxd



GLENN-COLUSA CANAL BRIDGE AND STAGING AREA

Colusa Generating Station
E&L Westcoast, LLC
Colusa County, California

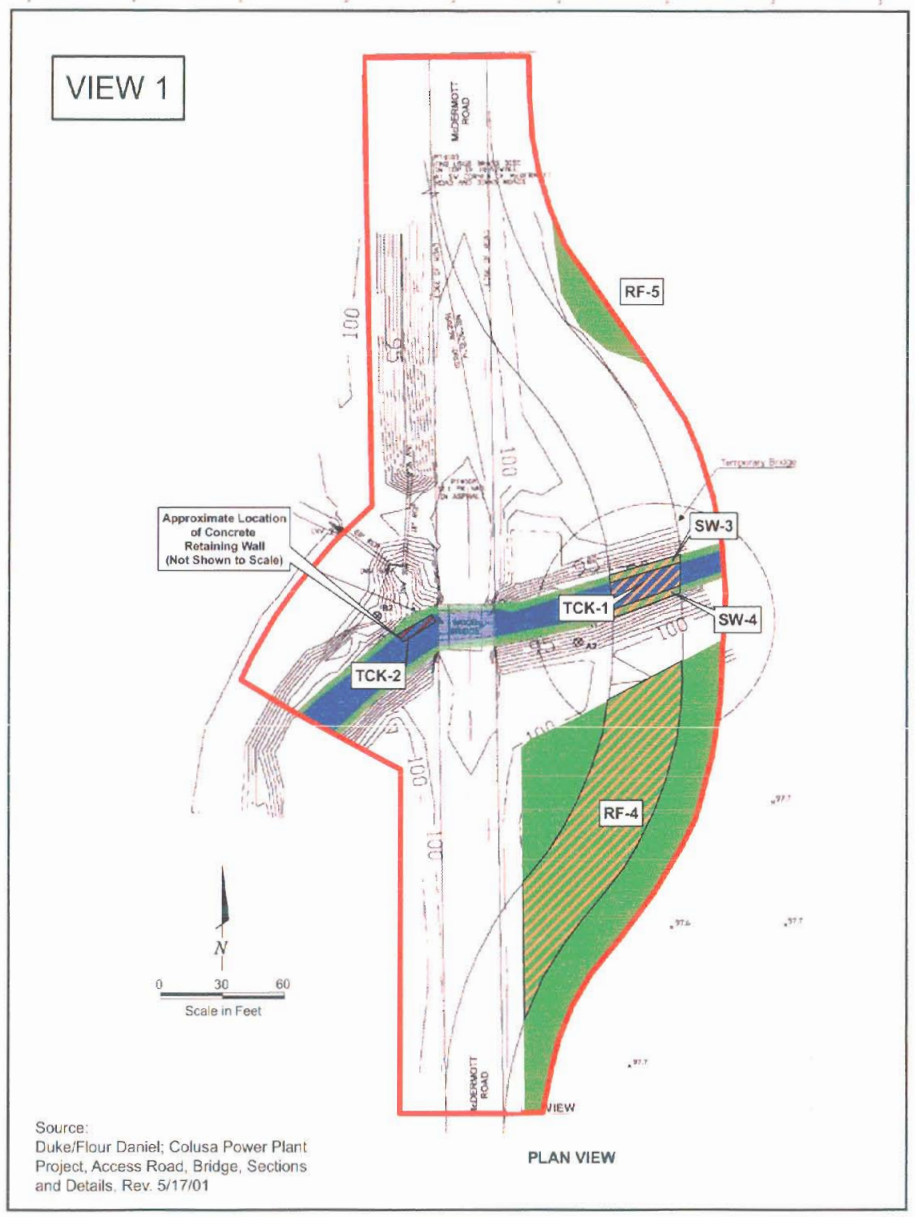
28067004
October 2007

URS

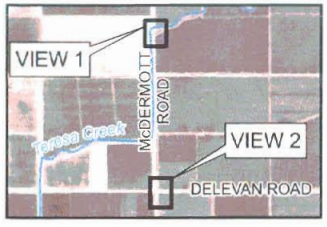
FIGURE 3

10/19/07 hk ..\28067004 CPV Colusa 2007\AFC Supplement\F3_bridge stage area.ai

URS Corporation L:\Projects\Colusa_28067004\MXD\Current Working Documents\Construction Staging Areas.mxd Date: 7/2/2007 9:10:48 AM Name: smlowis0



Source:
Duke/Flour Daniel; Colusa Power Plant Project, Access Road, Bridge, Sections and Details. Rev. 5/17/01



Legend

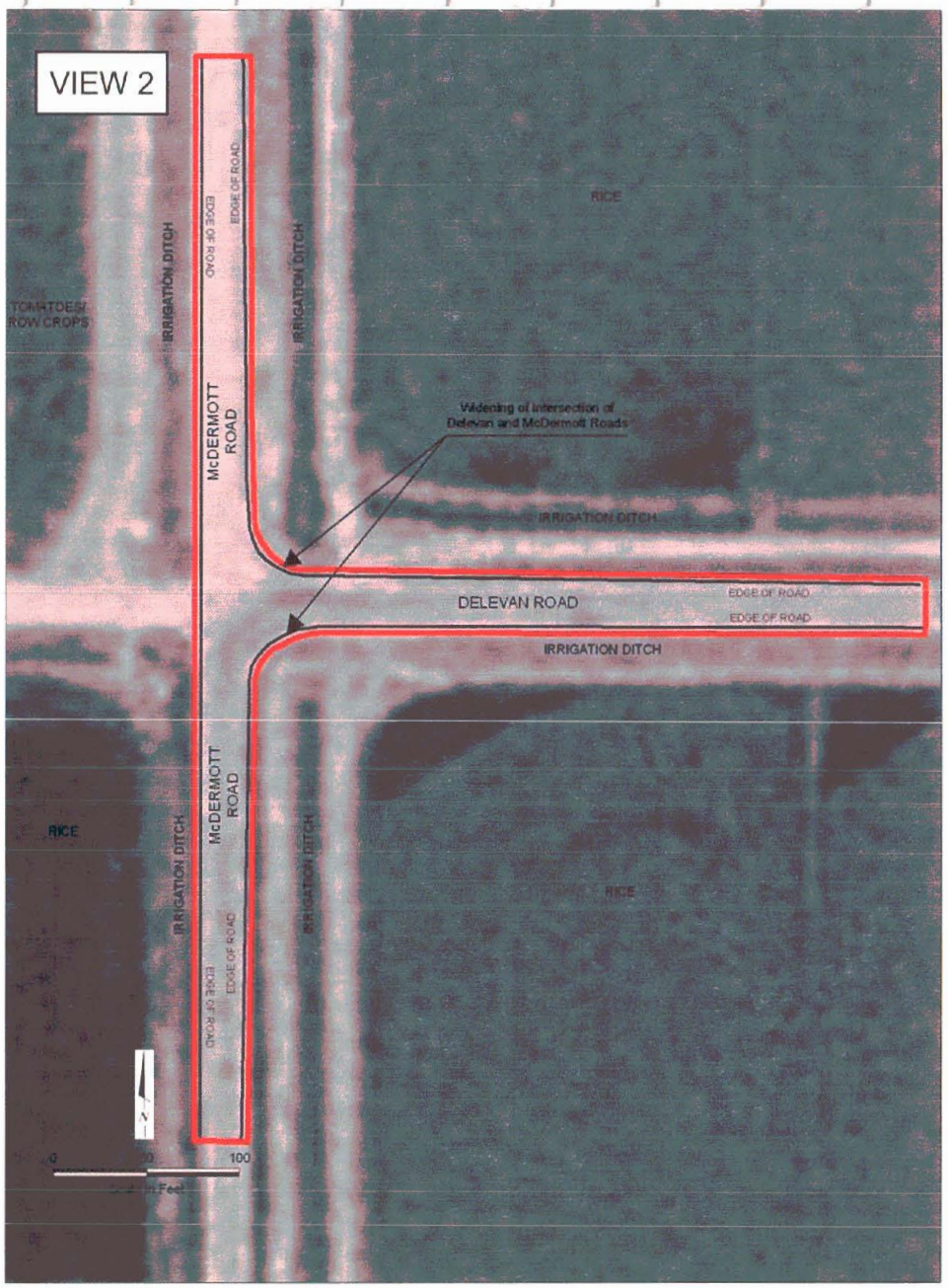
- Jurisdictional Delineation Study Area
- A1 ⊗ Delineation Data Point

Aquatic and Wetland Habitats

- SW Seasonal Wetland
- RF Cultivated Rice Field
- TCK Teresa Creek (Non-Wetland Waters of the U.S.)

Impacts

- Permanent Impact to Giant Garter Snake Aquatic Habitat
- Temporary Impact to Giant Garter Snake Aquatic Habitat



URS Corporation L:\Projects\Colusa_28067004\MXD\Current Working Documents\Delineation_report\figure_4B.mxd Date: 12/18/2006 5:11:10 PM Name: smlewis0

HABITATS IN THE VICINITY OF THE TERESA CREEK BRIDGE REPLACEMENT AND DELEVAN/McDERMOTT INTERSECTION IMPROVEMENT

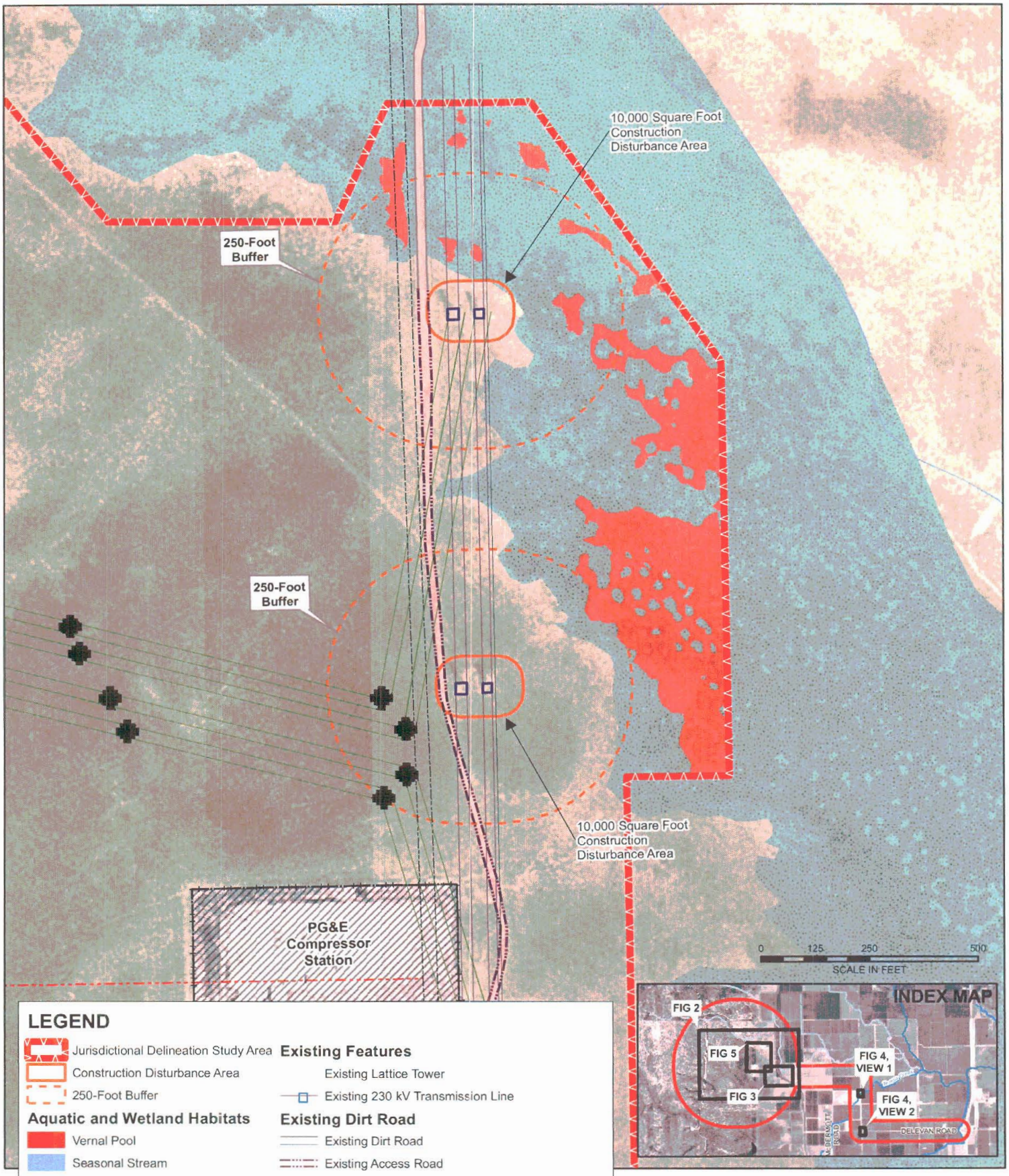
Colusa Generating Station
E&L Westcoast, LLC
Colusa County, California

28067004
October 2007

URS

FIGURE 4

10/19/07 hk ..\28067004 CPV Colusa 2007\AFC Supplement\F4_Teresa_Ck.ai



VERNAL POOLS IN THE VICINITY OF THE TRANSMISSION LINE INTERCONNECTION

Colusa Generating Station
28067004 E&L Westcoast, LLC
October 2007 Colusa County, California

URS

FIGURE 5

APPENDIX A

USFWS LIST OF SPECIAL-STATUS SPECIES

of Endangered Species Program contacts can be found at

Endangered Species Division

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 071011033725

Database Last Updated: August 16, 2007

Quad Lists

Listed Species

Invertebrates

- Branchinecta conservatio
  - Conservancy fairy shrimp (E)
- Branchinecta lynchi
  - vernal pool fairy shrimp (T)
- Desmocerus californicus dimorphus
  - valley elderberry longhorn beetle (T)
- Lepidurus packardi
  - Critical habitat, vernal pool tadpole shrimp (X)
  - vernal pool tadpole shrimp (E)

Fish

- Acipenser medirostris
  - green sturgeon (T) (NMFS)
- Hypomesus transpacificus
  - delta smelt (T)
- Oncorhynchus mykiss
  - Central Valley steelhead (T) (NMFS)
  - Critical habitat, Central Valley steelhead (X) (NMFS)
- Oncorhynchus tshawytscha
  - Central Valley spring-run chinook salmon (T) (NMFS)
  - Critical Habitat, Central Valley spring-run chinook (X) (NMFS)
  - Critical habitat, winter-run chinook salmon (X) (NMFS)

- winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

- Ambystoma californiense
  - California tiger salamander, central population (T)
- Rana aurora draytonii
  - California red-legged frog (T)

Reptiles

- Thamnophis gigas
  - giant garter snake (T)

Birds

- Strix occidentalis caurina
  - northern spotted owl (T)

Plants

- Chamaesyce hooveri
  - Hoover's spurge (T)
- Cordylanthus palmatus
  - palmate-bracted bird's-beak (E)
- Orcuttia pilosa
  - hairy Orcutt grass (E)
- Tuctoria greenei
  - Greene's tuctoria (=Orcutt grass) (E)

Candidate Species

Birds

- Coccyzus americanus occidentalis
  - Western yellow-billed cuckoo (C)

Quads Containing Listed, Proposed or Candidate Species:

COLUSA (546A)

WILLIAMS (546B)

CORTINA CREEK (546C)

MANOR SLOUGH (547A)

PRINCETON (562A)

LOGANDALE (562B)

MAXWELL (562C)

MOULTON WEIR (562D)

LOGAN RIDGE (563A)

SITES (563D)

WILLOWS (578C)

County Lists

No county species lists requested.

Key:

- (E) Endangered - Listed as being in danger of extinction.
- (T) Threatened - Listed as likely to become endangered within the foreseeable future.
- (P) Proposed - Officially proposed in the Federal Register for listing as endangered or threatened.
- (NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.
- Critical Habitat - Area essential to the conservation of a species.
- (PX) Proposed Critical Habitat - The species is already listed. Critical habitat is being proposed for it.
- (C) Candidate - Candidate to become a proposed species.
- (V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.
- (X) Critical Habitat designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, or may be affected by projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.
- During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.
- If no Federal agency is involved with the project, and federally listed species may be taken as part of

the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

- Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our critical habitat page for maps.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

Updates

URS

August 24, 2007

Ms. Michelle Tovar
Fish and Wildlife Biologist
U.S. Fish & Wildlife Service
Endangered Species Division-Sacramento Valley Branch
2800 Cottage Way, Suite W2605
Sacramento, CA 95825-3901

Re: Colusa Generating Station Project – Supplement to the Biological Assessment

Dear Ms. Tovar:

This letter presents supplemental information to the December 2006 biological assessment for the Colusa Generating Station (CGS) project. The supplemental information is organized into two parts: (1) information requested by the U.S. Fish and Wildlife Service (USFWS) at the inter-agency site visit on February 6, 2007 and (2) updated effects and compensation discussions based upon the 2007 listing of the Southern Distinct Population Segment (DPS) of the North American green sturgeon (*Acipenser medirostris*) and changes to the design of the Glenn Colusa Canal Bridge.

INFORMATION REQUESTED AT THE FEBRUARY 2007 SITE VISIT

USFWS requested the following information at the inter-agency site visit on February 6, 2007:

- A California tiger salamander (CTS) (*Ambystoma californiense*) habitat assessment that evaluates the duration of inundation at seasonally ponded sites within the project area and vicinity that could be utilized by breeding CTS.
- Evaluation of the alkali grassland habitat and re-evaluation of the vernal pool habitat in the project site and vicinity to determine whether these habitats are suitable to support listed vernal pool branchiopods (i.e., conservancy fairy shrimp (*Branchinecta conservatio*), vernal pool tadpole shrimp (*Lepidurus packardi*), and vernal pool fairy shrimp (*Branchinecta lynchi*)).
- Detailed delineation of the vernal pools within 250 feet of the proposed transmission line interconnection.

URS has conducted additional field and background reviews to collect the requested information. The results of these efforts are summarized in the following sections. The first section presents the results of the CTS habitat assessment, the second section presents our evaluation of the alkali

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612-1924
Tel: 510.893-3600
Fax: 510.874.3268
www.urscorp.com

grassland habitat and the third section summarizes the results of the detailed vernal pool mapping and delineation conducted by URS.

Habitat Assessment for California Tiger Salamander in the Project Site and Vicinity

USFWS requested that URS evaluate the hydrology of seasonally ponded sites throughout the project vicinity to determine whether these sites may be inundated long enough for CTS to successfully breed. URS conducted a preliminary habitat assessment for CTS in the project site and vicinity in winter/spring 2007. This assessment included a review of the available CTS literature, historic CTS observations/surveys in Colusa County and neighboring counties, and conversations with Mark Jennings, a noted CTS biologist who is familiar with the nearest occurrences in Yolo County.

Life History of CTS

CTS breeding habitat consists of seasonal and perennial ponds, vernal pools, low gradient streams, and stock ponds that contain water for at least 10 weeks beyond the breeding season (CDFG 2003; USFWS 2004). CTS migrate to breeding locations at the first rain events of the fall/winter (Stebbins 1985, 1989; Shaffer et al. 1993) and breed typically from November to May, with greatest activity occurring December to February (Storer 1925; Loredo and Van Vuren 1996; Trenham et al. 2000). Males usually remain in the ponds for an average of about six to eight weeks, while females stay for approximately one to two weeks. In dry years both sexes may stay for shorter periods (Loredo and Van Vuren 1996; Trenham 1998). Females lay their eggs and the eggs hatch in 10 to 14 days to larvae (Twitty 1941; Shaffer et al. 1993; Petranka 1998). Upon hatching, CTS larvae are aquatic and feed on zooplankton, small crustaceans, or small aquatic insects for about six weeks until they switch to larger prey such as smaller tadpoles of Pacific treefrogs (*Pseudacris regilla*) and California red-legged frogs (*Rana aurora*) (Anderson 1968). Larval CTS usually require between three to six months for metamorphosis (USFWS 2004). After breeding, adult CTS leave the pools and return to small mammal burrows in upland habitat for aestivation, where they spend most of the year (CDFG 2003; USFWS 2004). CTS are known to migrate up to between 1.24 miles (mi) (CDFG 2003) to 1.3 mi (USFWS 2004; Sweet 1998) from breeding sites to upland refuges.

California tiger salamander upland habitat typically consists of grassland savannah with high levels of rodent activity, particularly squirrels and gophers (USFWS 2004). The CTS utilizes rodent burrows and other upland refugia but they cannot dig their own burrows. The distance CTS travel between aestivation habitat and breeding sites varies greatly and depends on topography, vegetation, and the distribution of small mammal burrows (USFWS 2004). In defining critical habitat for tiger salamanders, USFWS used a distance of 0.7 mi from known occurrences, which according to Pete Trenham, Ph.D., would likely include 99 percent of the inter-pond movement of breeding adults (USFWS 2005).

Historic and Current Range of CTS

According to Jennings (2006) the CGS project site is in the historic range of CTS but the CTS populations in the northern portion of their historic range are scattered and few (Attachment A). The patchy distribution of CTS may have been caused by anthropogenic changes, such as the extensive conversion of land to agricultural uses (USFWS 2004). Irrigated agriculture has removed and fragmented aquatic and upland habitats used by CTS for migration, aestivation, and breeding. The introduction of irrigated agriculture has also created dispersal routes for non-native predatory fish and invasive species such as the bullfrog. This is reflected in the greater abundance of predatory fish in the northern Sacramento Valley (USFWS 2004). The canals and rice fields adjacent to the CGS project site provide a source of non-native bullfrogs and fish species. The extirpation of a CTS population is likely with the introduction of these non-native predators (USFWS 2004).

The CGS project site is isolated from the nearest known historical location of CTS in southern Glenn County by more than 10 mi (CDFG 2007). This CTS sighting occurred in 1963 in a drainage ditch along Highway 99 West, about 1.5 mi north of Willows. However, this occurrence was originally reported as being in Butte County along Highway 99 East. This occurrence is now considered extirpated by CDFG (2007). There have been no other observations of California tiger salamander north of Yolo County during the past 40 years (CDFG 2007; Attachment A - CTS Range Map).

No CTS adults, juveniles, or larvae were observed during recent surveys conducted in Colusa County and Lake County. The Delevan National Wildlife Refuge, approximately 10 mi southeast of the project site, has potential habitat that is suitable for CTS (Wulder 2007). However, no CTS have been observed during surveys conducted by the refuge's biologists (Wulder 2007). No CTS adults, juveniles, or larvae were observed during CTS surveys in Lake County, which is the County directly west of Colusa County, in 2002/2003 by Mark Jennings (Jennings 2007). These surveys were conducted for a landfill closure project, the Geothermal Inc. Facility Closure. Also, URS biologists have not observed CTS adults, juveniles, or larvae at the project site or vicinity during any of the site visits in March and April 2001, August through October 2006, or February through April 2007.

Potential for Habitat Suitable for CTS Breeding and Aestivation in the Project Site and Vicinity

Habitats that may potentially be suitable for CTS breeding and aestivation are located in the project site and vicinity. These habitat types include vernal pools, stock ponds, seasonally ponded sites, and annual grasslands (Figure 1). Vernal pools near the project site were assessed for potential suitable habitat for breeding CTS in March and April of 2001 and 2007 by URS biologists Steve Leach, Corinna Lu, Jan Novak, and Melissa Newman. Stock ponds and seasonally ponded areas in the project vicinity were surveyed for potential suitable habitat for breeding CTS on March 21, 2007 and April 19, 2007 by URS biologists Melissa Newman and

Derek Jansen. All site visits were timed to coincide with the optimal period for observation of wetland hydrology.

Vernal Pools. Vernal pools are located near the transmission line interconnection and also north and south of the existing PG&E access road (Figure 1). Ground squirrel burrows, which provide habitat for aestivating CTS, are present in the upland areas adjacent to the vernal pool grassland complex, in the area east of the existing PG&E Compressor Station.

In 2001 and 2007, the observed duration of ponding in the vernal pool habitats near the project site was shorter than the 3-month minimum duration that larval salamanders require to metamorphose. Larval CTS typically require 3 to 6 months before they are mature enough to metamorphose (change into a different physical form) and larval CTS will die if a site dries before they complete their metamorphosis (USFWS 2004). Therefore, it is unlikely that the vernal pool habitats near the project site would support CTS.

Stock Ponds and Seasonally Ponded Sites. During the March 21, 2007 and April 19, 2007 surveys URS biologists visited stock ponds and sites that could potentially pond within the project vicinity to examine their suitability as breeding habitat for CTS. These areas are referred to as "site(s)" throughout the rest of this document. Six potential CTS breeding sites were visited during the two surveys. Five additional potential CTS breeding sites were identified through aerial photography outside of the California Energy Commission's required 1-mile biological study area; however, these sites were not accessible during the 2007 surveys (Figure 1). Seven culverts were also examined to determine if they would be suitable for CTS to use as migration routes from the area west of the Tehama-Colusa Canal east towards the project area and vice versa (Figure 1). Photographs of the sites and culverts are provided in Attachment B – Photographs.

Table 1 summarizes the ponding and habitat characteristics of each of the sites visited during the March/April 2007 surveys.

Many of the sites contained little or no water at the time of the March/April 2007 site visits. Due to the lower than average rainfall in 2007, it is likely the sites have had little or no water at all this entire year (average yearly total July 1, 2006 to April 19, 2007 = 6.53 inches [UCD 2007; Williams C. Station], average yearly total rainfall for this region is approximately 15.5 inches [World Climate 2007]). Many of the sites in the project vicinity have not been inundated long enough during 2007 to support the metamorphosis of larval CTS. This species requires between 3 to 6 months of inundation to complete metamorphosis (USFWS 2004). However, in years with normal rainfall some of the sites may pond long enough to support larval CTS development.

Very little or no vegetation surrounded most of the stock ponds and seasonally ponded depressions in the project vicinity during the 2007 season. Sites lacking appropriate vegetation and/or substrates would not be suitable for breeding CTS. Female CTS typically attach eggs to vegetation near the edge of the breeding ponds (Storer 1925; Twitty 1941), but in ponds with limited or no vegetation, eggs may be attached to objects (rocks, boards, etc.) on the bottom of

the pond (Jennings and Hayes 1994). Most of sites in the project vicinity could not have been used by CTS for egg attachment this year. However, the lack of vegetation in the sites may have been due to the low level of rainfall in 2007 and in years with normal rainfall vegetation may be available for breeding CTS.

Table 1. Sites Observed During March and April 2007 Surveys

Site	Inundated March 21	Inundated April 19	Site Contained Vegetation/Substrate that is Suitable for Breeding CTS	Potential Breeding Site in 2007
1	no	no	possibly	**no**
2	yes	no	no	**no**
3	yes	yes	no	**no**
4	yes	yes	yes	**yes**
5	no	no	possibly	**no**
6	yes	no	possibly	**no**

Only Site 4 had adequate inundation duration and vegetation characteristics required to support breeding CTS (Attachment B – Photographs). This stock pond was lined with California tule (*Scirpus californicus*) and other grass species (Attachment B – Photographs). Female CTS may use these grasses for egg attachment. Site 4 also contained approximately 1 foot of water that is of good quality. This site likely ponds seasonally, unless an upstream source of water drains into it in the summer. However, the inundation of this stock pond may be shorter than seasonal if water is drawn from the pond by local landowners. No bullfrogs (adults, juveniles, or larvae) were observed at this stock pond. The habitat conditions at Site 4 would allow CTS to use it for breeding activities if CTS are present in the project vicinity. A buffer of 0.7 mi around Site 4 would qualify as potential high-quality aestivation habitat for CTS (Figure 2). The 0.7 mi buffer of upland habitat is based on the critical habitat definition which estimates 99 percent of breeding adults will be found within this distance of breeding ponds (USFWS 2005). A buffer of 0.7 to 1.3 mi around Site 4 would be of lower-quality aestivation habitat for CTS. The distance of 1.3 mi represents the approximate maximum distance CTS have been observed to move from breeding ponds (USFWS 2004; Sweet 1998). Annual grassland habitat in the western portion of the proposed project site has the highest likelihood of being used by CTS dispersing from Site 4 since this area falls within 0.7 mi of Site 4 (Figure 2). However, all annual grassland habitat in the proposed project site west of the GCID Canal is within 1.3 mi of Site 4 and has a low potential of being used for aestivation by CTS dispersing from this site.

Site 2 may contain habitat that is suitable for breeding CTS in years with regular rainfall. At the March survey this site contained approximately 2.5 feet of water but at the April survey this site was completely dry (Attachment B – Photographs, Photos 5-8). In August 2006, a year with higher than average rainfall, this site was still inundated at the end of summer and was lined with vegetation that could be used by CTS for egg attachment and cover (Attachment B – Photographs, Photo 9). This site was inundated for more than 3 months in the 2006 wet season. However, the 2006 wet season had above-normal rainfall. The habitat conditions present at Site 3 in 2006 would allow CTS to use it for breeding activities if CTS are present in the project vicinity. A buffer of 0.7 mi around Site 3 would qualify as potential high-quality aestivation habitat for CTS (Figure 2). A buffer of 0.7 to 1.3 mi around Site 3 would be of lower-quality aestivation habitat for CTS. If CTS are present at Site 2, they would most likely be within 0.7 mi of this breeding habitat. No portion of the proposed project site falls within 0.7 mi of Site 2 (Figure 2). However, all annual grassland habitat in the proposed project site west of the GCID Canal is within 1.3 mi of Site 2 and has a low potential of being used for aestivation by CTS dispersing from this site.

Two other sites in the project vicinity, Site 3 and Site 6 were both inundated at the time of the March survey, but only Site 3 was still inundated at the time of the April survey (Attachment B – Photographs). In March water depth at both sites ranged from 6 to 8 inches, while in April water depth at Site 3 was between 3 to 6 inches. Both sites contained a large amount of sediment and Site 6 held stagnant water and algae. These conditions limit the amount of oxygen CTS eggs and larvae would need to survive. Site 6 contained diving beetles (*Dytiscus* sp.) at the March survey. Adult diving beetles are predators of CTS larvae (Holomuzki 1986). In previous years with regular rainfall these sites may have contained water and vegetation more suitable for CTS breeding.

Ponds 1 and 5 were not inundated at either the March or April surveys and may not have been ponded at any time this season. CTS could not have used these ponds for breeding activities this year.

One of the inaccessible stock ponds located approximately 1.2 mi south of the project site (Figure 1) is not likely suitable habitat for breeding CTS. During the March site visit, Jim Rickert, of Prather Ranch Farms (located in the Holthouse Ranch Land parcels in the project vicinity), informed URS biologists that the site inundated year round. Invasive species such as bullfrogs and fish are known to inhabit year round ponded sites. These species are predators of CTS. The conditions of the 4 other inaccessible stock ponds is unknown.

Annual Grasslands. California annual grasslands in the project area and vicinity are highly degraded from past years of overgrazing by cattle. This disturbance favors the spread of yellow star thistle (YST) and this species is now widespread throughout the upland areas (see photo 23 in Attachment B - Photographs). CTS movement through the upland areas between breeding sites and aestivation sites would not be favorable during the blooming period of YST (May to October). However, CTS are not likely to be migrating over the upland areas during YST's

blooming period and would most likely be aestivating (CTS breeding season occurs during the rainy season, typically November to May with greatest activity occurring December to February [Storer 1925; Loredo and Van Vuren 1996; Trenham et al. 2000]).

Potential CTS Migration Routes. Seven concrete culverts running underneath the Tehama-Colusa Canal were examined during the surveys to determine if they are suitable dispersal routes for CTS (Figure 1). Culverts 1, 2, 5, 6, and 7 may be used by CTS for migration, while culverts 3 and 4 would not likely be accessible for this species. Culvert 3 has concrete barriers that likely prevent CTS from moving through it. Culvert 6 was fully inundated at the time of the surveys; although, this may not be the case in all years. If CTS are present in the project vicinity, they may be using the culverts to migrate between ponding and aestivation sites on both sides of the Tehama-Colusa Canal.

Conclusion

Of the pond sites examined during the habitat assessment surveys, Site 4 and Site 2 in the project vicinity may be suitable for CTS breeding. These sites contain the necessary vegetation for CTS egg attachment and are likely inundated long enough to support CTS larval development. CTS would most likely aestivate in upland areas within 0.7 mi of these potential breeding sites, although CTS could disperse as far as 1.3 miles away. Annual grasslands in the western portion of the proposed project site lie within 0.7 mi of Site 4 (Figure 2) and this area has the highest likelihood of being used by CTS dispersing from Site 4. No portion of the proposed project site lies within 0.7 mi of Site 2. All annual grassland habitat in the proposed project site west of the GCID Canal is within 1.3 miles of both sites and is potential low quality CTS aestivation habitat. However, the likelihood that annual grasslands in the project site would be used by CTS for aestivation depends on the concentration of available ground squirrel burrows in the grassland habitat, with higher ground squirrel activity ~~correlating to a higher likelihood of CTS presence~~.

While there is suitable breeding habitat in the project vicinity and suitable CTS aestivation habitat in both the project site and vicinity, it is unlikely CTS are present in the project area. ~~It is doubtful that the~~ project vicinity ~~is even within the current range of CTS. There~~ have been no documented observations of this species north of Yolo County in the past forty years (CDFG 2007). No CTS have been observed during surveys conducted in nearby counties and refuges (Wulder 2007; Jennings 2007). Irrigated agriculture in the project vicinity has removed and fragmented aquatic and upland habitats used by CTS for migration, aestivation, and breeding. The introduction of irrigated agriculture has also created dispersal routes for non-native predatory fish and invasive species such as the bullfrog. These species are likely present in the cultivated rice fields and canals in the project vicinity. A significant inverse association of CTS with predatory fishes and bullfrogs has been found (USFWS 2004). Based on this information, CTS are not likely to be present in the vicinity of the project site.

To avoid potential adverse affects to the California tiger salamander E&L Westcoast would implement the following mitigation measures during construction activities in annual grasslands within 0.7 mi of Site 4:

- Prior to construction, a qualified biologist would flag sensitive areas that need to be avoided and would establish a visible buffer zone (15 feet) around California tiger salamander habitat. No groundwork would be conducted in the buffer zone or sensitive areas and all vehicles would stay out of these areas.
- Construction activities would be timed to occur during the dry season (non-breeding season for California tiger salamander) (April 15 to October 15) to minimize take of dispersing salamanders.
- Prior to construction, a qualified biologist would conduct training sessions to familiarize all construction personnel with the following: identification of California tiger salamander, their habitat, general provisions and protections afforded by the ESA, measures implemented to protect the species, and a review of the project boundaries. This training would also be provided within 30 days of the arrival of any new worker.
- A biological monitor would be present while the trench is excavated, and would examine any open trenches prior to the onset of construction each morning. Any adult salamander found in an open trench would be transported out of the study area by a USFWS-approved biologist with the appropriate permit and released into a burrow system.
- A USFWS-approved biologist would contact the USFWS to determine whether moving any of the California tiger salamander life-stages is appropriate. If the USFWS approves moving the animals, the biologist would be allowed sufficient time to move salamanders from the worksites before work activities begin.
- During work activities, trash that may attract predators would be properly contained, removed from the worksite, and disposed of regularly. Following construction, trash and construction debris would be removed from work areas.
- E&L Westcoast would provide the USFWS a report on the impacts of the proposed project to California tiger salamander. The report would provide the results of biological surveys and sighting records, and also document the following: the number of California tiger salamanders relocated from the study area or killed or injured during the proposed project construction; the dates and times of capture, mortality, or injury; specific locations of capture, mortality, or injury; approximate size and age of individuals; and a description of relocation sites.

With the implementation of these measures impacts to California tiger salamander would be less than significant.

Evaluation of Alkali Grassland Habitats and Updated Vernal Pool Mapping

Additional site visits were conducted March 9, 14, and 21, 2007 and April 19, 2007 by URS biologists Steve Leach, Jan Novak, Melissa Newman, and Derek Jansen to clarify the following:

- The jurisdictional status and hydrology of the alkali grassland areas west of the proposed project site.
- The suitability of alkali grassland areas to support vernal pool branchiopods.
- Re-evaluation of the suitability of vernal pool areas to support vernal pool branchiopods.
- The location and jurisdictional status of vernal pools near the proposed transmission line interconnection.

Alkali grasslands in the project area are not suitable for vernal pool branchiopods (Attachment B – Photographs). During the March site visits additional data points were recorded in the alkali grassland area west of the proposed project site. All of the alkali grassland data points were determined to be non-wetland sites based on the low cover (<50 percent cover) of hydrophytic plant species and the absence of definitive hydric soil characteristics. No saturation or surface ponding was observed in the alkali grassland habitat and there is no evidence that this area has previously ponded water.

Vernal pools, which have the potential to support special-status branchiopod species, are present north and south of the existing PG&E access road and near the transmission line interconnection. During site visits in both 2007 and 2001 the vernal pools near the project site did not contain ponded water. Although in March 26, 2001 the soil in many of the pools was still saturated at the surface. In late March 2001, a few pools in the complex and a pool adjacent to the existing PG&E access road had moderate amounts of ponded water in late March 2001. Vernal pool habitat near the transmission line interconnection appears to pond water deeper than 1 inch for at least 4 to 8 weeks during the winter months and remains dry during the summer months, which would be adequate conditions to support listed branchiopod species. Vernal pool branchiopods require a relatively short period of inundation to complete their life cycle (USFWS 1994). Vernal pools near the project site have the potential to support listed branchiopod species and the presence of these species would be assumed based on known occurrences in the project vicinity.

The jurisdictional boundaries of the vernal pools near the proposed transmission line interconnection have been mapped more precisely. The updated boundaries are incorporated into Figure 5 of the Revised Jurisdictional Delineation Report that was submitted to the U.S. Army Corps of Engineers (ACOE) on April 5, 2006. A copy of this report was submitted to USFWS.

UPDATED EFFECTS AND COMPENSATION DISCUSSION

North American Green Sturgeon

When the California Energy Commission Application for Certification and the Biological Assessment were submitted in 2006 the Southern Distinct Population Segment of the North American green sturgeon was proposed to be listed as threatened under the Federal Endangered Species Act. On April 4, 2007 the USFWS added the southern DPS of the green sturgeon to its List of Endangered and Threatened Wildlife (USFWS 2007). The southern DPS of the green sturgeon consists of all coastal and Central Valley populations south of the Eel River, with the only known spawning population in the Sacramento River (USFWS 2006).

The green sturgeon is anadromous, spending its adult life in the ocean but ascending coastal streams in the winter where it remains to spawn the following summer. Adults typically begin migrating in February and spawn from March through July, with a peak from mid-April to mid-June (Moyle et al. 1995). Green sturgeon are thought to spawn every 3 to 5 years in deep pools with turbulent water velocities and prefer large cobble substrates, but substrate size can range from clean sand to bedrock (NOP 2001). Adult green sturgeons are presumed to leave shortly after spawning but larval green sturgeon may remain in the rivers and appear to move farther downstream as water flows increase. Juvenile green sturgeons spend 1-4 years in fresh and estuarine waters before dispersal to saltwater (Beamesderfer and Webb 2002).

Three waterways are located within the project site: the Tehama-Colusa Canal, the Glenn-Colusa Irrigation District Canal, and Teresa Creek. The proposed CGS project would include the construction of a water intake structure at the Tehama-Colusa Canal. The project would also replace the following two bridges: (1) a bridge on Dirks Road over the Glenn-Colusa Irrigation District Canal, and (2) a bridge on McDermott Road over Teresa Creek.

Teresa Creek is the local name for a tributary of Hunters Creek, a tributary to the Sacramento River. An adult steelhead (*Oncorhynchus mykiss*) was observed in 2001 below the Teresa Creek Bridge, in Teresa Creek. Based on the steelhead observation it is likely that Teresa Creek is accessible to green sturgeon. Although Teresa Creek is disturbed, and is channelized between earthen levees, anadromous fish may occasionally stray into this stream. However, habitats in Teresa Creek are not likely to be suitable for spawning or rearing anadromous fish because the stream lacks gravel substrates and vegetation cover that green sturgeon would require (Attachment B – Photographs). The stream channel substrate consists of small-diameter gravels that are not appropriate for spawning.

Anadromous fish are not likely to be present in the GCID Canal or the Tehama-Colusa Canal since both canals have fish screens at their respective diversion points on the Sacramento River. The diversion point for the Tehama-Colusa Canal is located at the Red Bluff Diversion Dam. The diversion point for the GCID Canal is located at a dam north of Hamilton City. Both canals lack substrates and in-stream vegetation that are suitable for spawning or rearing anadromous

fish (Attachment B – Photographs). Downstream migration of juvenile fish would be constrained by the presence of predators and substantial barriers. Both canals lack vegetation or other structures that would provide cover and foraging opportunities for juvenile fish. No anadromous fish are known to occur in the GCID Canal or Tehama-Colusa Canal.

Revised Glenn-Colusa Canal Bridge Design

E&L Westcoast L.L.C. (E&L Westcoast) has refined and revised the design for the Glenn-Colusa Canal Bridge replacement and the associated road alignment for the CGS Project. Information regarding the revised Glenn-Colusa Canal Bridge design was included in the August 17, 2007 submittal to the California Energy Commission (also attached).

New Permanent Impacts to Seasonal Wetlands

In the December 2006 Biological Assessment, no direct impacts to listed branchiopod habitat were anticipated. The revised southern Glenn-Colusa Canal Bridge design would directly impact the northern margins of two seasonal wetlands (direct impact = total of 0.018 acre), located on the southwest side of the GCID Canal, directly south of the existing PG&E access road (Figure 1; Attachment B). The two seasonal wetlands are potentially suitable habitat for listed branchiopod species. The presence of these species is assumed based on known occurrences in the project vicinity as described in the November 2006 AFC. The wetland mitigation measures in the November 2006 AFC, BIO-1 through BIO-3, would be implemented to minimize impacts to seasonal wetland habitat potentially supporting listed branchiopod species.

Unavoidable permanent impacts to listed branchiopod habitat would be mitigated according to preservation and creation ratios defined in the USFWS programmatic consultation for listed branchiopods (USFWS 1996). Preservation and creation credits of listed branchiopod habitat would be purchased at a USFWS-approved mitigation bank. Table 2 summarizes the compensatory mitigation. Implementation of the avoidance and minimization measures and the purchase of mitigation credits would reduce impacts to listed branchiopod species to a less than significant level.

Refinement of Vernal Pool Avoidance and Minimization Measures

The following measures would be implemented to avoid potential adverse effects to listed branchiopods within vernal pools:

- No ground-disturbing construction activities would occur within 250 feet of vernal pools.
- A USFWS-approved biologist would monitor construction-related activities at the proposed site to ensure that no habitat destruction occurs.
- All on-site construction personnel would receive a USFWS-approved worker environmental awareness training program to alert them of the established avoidance measures.

Table 2
Proposed Compensatory Mitigation for Listed Branchiopod Habitat Following USFWS' 1996 Vernal Pool Programmatic Consultation

Habitat	Direct Permanent Area of Impact (acres)	Total Area of Affected Wetland (acres)	Proposed Mitigation Ratio		Type of Mitigation
			Preservation 2:1	Creation 1:1	
Seasonal Wetland 1	0.005	0.113[1]	0.226	0.113	Off-site at a USFWS-approved mitigation bank
Seasonal Wetland 2	0.014	0.041[1]	0.082	0.041	Off-site at a USFWS-approved mitigation bank
Total Proposed Mitigation (acres)			0.308[2]	0.154[2]	

[1]The USFWS programmatic consultation with the ACOE requires compensation to be based on the entire area of the affected pool rather than the area of fill or temporary disturbance (USFWS 1996).

[2] Compensatory mitigation for impacts to seasonal wetlands would be the greater amount for either impacts to listed branchiopod habitat or jurisdictional wetlands, but not both.

- All construction activities within 250 feet of vernal pool habitat would be limited to the dry season (May 1 to October 15) when listed vernal pool branchiopods are only present as durable resting eggs (cysts) and branchiopod habitat is less likely to be indirectly affected by erosion or sedimentation.
- Upon completion of the project, all areas that have been temporarily impacted by the project would be restored to approximate original site conditions (e.g., topography, hydrology, and vegetation).

The following additional listed branchiopod avoidance and minimization measures are specific to work activities associated with the transmission line towers:

- Prior to construction, a buffer zone, located 250 feet from the wetland margins of the vernal pools with potential to be indirectly disturbed during construction, would be clearly marked as a sensitive areas by a USFWS-approved biologist.
- All ground-disturbing activities would be excluded from the buffer zone for the duration of construction. Only rubber-tired vehicles would be allowed within the buffer zone. No vehicles or personnel would be allowed within the wetland boundaries of the vernal pools to protect special-status plants and the cysts of listed vernal pool branchiopods.
- If necessary, a path may be mowed through the vegetation to reduce fire hazard, using an attachment to the rubber tired vehicle. No blading of vegetation may occur.

The following additional listed branchiopod avoidance and minimization measures are specific to work activities associated with roadwork on the existing PG&E access road west of the new Glenn-Colusa Canal Bridge approach road:

- Roadwork on the existing PG&E access road west of the new bridge approach road would be confined to the top of the existing road embankment. The road would be repaved but the shoulders of the road would not be widened and no ground-disturbing work would occur on the sides of the embankment. Repaving of the road would occur after construction is completed, sometime in early 2010.
- Straw wattles or silt fences would be used, as needed, to prevent sediment from disturbed areas from reaching pools during rainy periods. Straw wattles would be installed at the top of the PG&E access road embankment during paving to prevent paving materials, sediment or other contaminants from reaching vernal pools. Straw wattles would be regularly inspected and maintained for the duration of construction or until the disturbed areas have been revegetated.
- No vehicles would be allowed to drive off of the existing PG&E access road west of the new bridge approach next to the vernal pools.
- No vehicles or personnel would be allowed within the wetland boundaries of the vernal pools to protect special-status plants and the cysts of listed vernal pool branchiopods.

Revised Compensatory Mitigation for Giant Garter Snake

The potential impacts to giant garter snake habitat are less than the threshold required to append the CGS project to the USFWS programmatic biological opinion for giant garter snake (USFWS 1997). The revised amounts of compensatory mitigation proposed for potential impacts to giant garter snake are provided in Table 3.

Table 3 Impacts to Giant Garter Snake Habitat and Proposed Mitigation for the Colusa Generating Station Project[1]				
Habitat Impacted	**December 2006 BA**	**August 2007 Revised Bridge Design**		
	Area of Impact (acres)	**Area of Impact (acres)**	**Proposed Mitigation Ratio[2]**	**Proposed Mitigation**
Permanent Impacts				
freshwater marsh	0.035	0.279	3:1	0.837 acre[3]
cultivated rice field	0.270	0.362	3:1	1.086 acre[3]
irrigation ditch	0.294	0	3:1	0 acre[3]
GCID Canal	0	0.029	3:1	0.087 acre[3]
perennial stream (Teresa Creek)	0.014	0.014	3:1	0.042 acre[3]
total aquatic habitat area	**0.613**	**0.684**		**2.052 acre aquatic habitat and 4.104 upland habitat[4]**
Temporary Impacts				
freshwater marsh	0.094	0.120	1:1	On-site restoration of affected area[3]
cultivated rice field	>1.643	1.401	1:1	On-site restoration of affected area[3]
irrigation ditch	0.378	0.214	1:1	On-site restoration of affected area[3]
GCID Canal	0	0.006	1:1	On-site restoration of affected area[3]
perennial stream (Teresa Creek)	Exact acreage unknown at time of submittal of November 2006 AFC	0.040	1:1	On-site restoration of affected area[3]
total aquatic habitat area	**>2.115**	**1.781**	1:1	On-site restoration of affected area[3]

Table 3
Impacts to Giant Garter Snake Habitat and Proposed Mitigation for the Colusa Generating Station Project[1]

Habitat Impacted	December 2006 BA	August 2007 Revised Bridge Design		
	Area of Impact (acres)	Area of Impact (acres)	Proposed Mitigation Ratio[2]	Proposed Mitigation

[1]This table replaces the information contained in Table 8.2-8 in the November 2006 Application for Certification.

[2]Mitigation would be provided that is consistent with the USFWS Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo Counties, California. November 13, 1997.

[3]Resulting mitigation would be the greater amount for either impacts to giant garter snake habitat or jurisdictional wetlands, but not both.

[4]Proposed compensation would include off-site replacement of two acres of upland habitat for each acre of aquatic habitat replaced (USFWS 1997).

The U.S. Army Corps of Engineers will be the lead federal agency for consultation with the USFWS under section 7 of the Endangered Species Act. A letter initiating formal consultation was transmitted to the USFWS on June 13, 2007.

If you have questions regarding this letter please contact Steve Leach at 510-874-3205 or Melissa Newman at 510-874-1747.

Sincerely,

URS CORPORATION

Steve Leach
Senior Biologist

Enclosure

cc: Andrew Welch, E&L Westcoast
Dale Shileikis, URS
John Mathias, CEC
Brian Vierria, USACOE
Shahera Kelley, EPA
John Baker, NMFS

References

Anderson, P. R. 1968. The reproductive and developmental history of the California tiger salamander. Masters thesis, Department of Biology, Fresno State College, Fresno, California. 82pp.

Beamesderfer, R.C.P. and M.A.H. Webb. 2002 Green sturgeon status review information. S.P. Cramer and Associates, Gresham, Oregon, U.S.

California Department of Fish and Game (CDFG). 2003. Interim Guidance on Site Assessment and Field Survey for Determining Presence or a Negative Finding of the California Tiger Salamander. October.

California Department of Fish and Game (CDFG). 2007. Rarefind 3, an application allowing access to the California Natural Diversity Data Base. California Department of Fish and Game, Sacramento, CA. Accessed April 5.

Holomuzki, J. R. 1986. Predator avoidance and diel patterns of microhabitats used by larval tiger salamanders. Ecology 1986: 737-748.

Jennings, M. R. 2006. Personal communication between URS biologist Melissa Newman and Mark Jennings of Rana Resources regarding the current range and potential presence of California red-legged frog and California tiger salamander in the Colusa Generating Station Project's biological study area. August 31, 2006.

Jennings, M.R. 2007. Rana Resources. Personal communication between URS biologist Melissa Newman and Mark Jennings of Rana Resources regarding his CTS studies in Sonoma County and Lake County. April 26, 2007.

Jennings, M. R., and M. P. Hayes. 1994. Amphibian and reptile species of special concern in California. Final report to California Dept. of Fish and Game.

Loredo, I. and D. VanVuren. 1996. Reproductive ecology of a population of the California tiger salamander. Copeia 1996: 895-901.

Moyle, P.B., R.M. Yoshiyama, J.E. Williams, and E.D. Wikramanayake. 1995. Fish Species of Special Concern in California. Second edition. Final report to CA Department of Fish and Game, contract 2128IF.

Notice of Petition (NOP). 2001. Petition to list the North American Green Sturgeon (*Acipenser medirostris*) as an endangered or threatened species under the endangered species act.

Petitioners: Environmental Protection Information Center; Center for Biological Diversity; Waterkeepers Northern California. June.

Petranka, J. W. 1998. Salamanders of the United States and Canada. Smithsonion Institution Press.

Shaffer, H. B., R. N. Fisher, and S. E. Stanley. 1993. Status report: the California tiger salamander (*Ambystoma californiense*). Final report for the California Department of Fish and Game. 36 pp. plus figures and tables.

Stebbins, R. C. 1985. A field guide to western reptiles and amphibians. Houghton Mifflin Co. Boston, Massachusetts. pp. 33-37.

Stebbins, R. C. 1989. Declaration of R. C. Stebbins in support of petition of writ of mandate. Sierra Club and Richard Pontuis v. Gilroy City Council, Shappell Industries et al. Santa Clara County Superior Court. March 16, 1989. 11 pp. plus exhibits.

Storer, T. I. 1925. A synopsis of the amphibia of California. University of California Publications in Zoology 27: 60-71.

Sweet, S., University of California, Santa Barbara. 31 August 1998 letter to Dwight Harvey, U.S. Fish and Wildlife Service. With enclosed report, "Vineyard development posing an imminent threat to Ambystoma californiense in Santa Barbara County, California"

Trenham, P.C. 1998. Demography, migration, and metapopulation structure of pond breeding salamanders. Unpublished Ph.D. dissertation. University of California, Davis. 96 pp.

Trenham P. C., H. B. Shaffer, W. D. Koening and M. R. Stromberg, 2000. Life history and demographic variation in the California tiger salamander. Copeia 2000(2):365-377.

Twitty, V. C. 1941. Data on the life history of *Ambystoma tigrinum californiense* Gray. Copeia 1941(1): 1-4.

University of California, Davis (UCD). 2007. Agriculture and Natural Resources Department, Integrated Pest Management Program. California Weather Data, Colusa County Station. http://www.ipm.ucdavis.edu:/WEATHER/wxretrieve.html

URS Corporation. 2006. Application for Certification for the Colusa Generating Station Project. Submitted to the California Energy Commission by URS Corporation on behalf of E&L Westcoast. November.

U.S. Fish and Wildlife Service (USFWS). 1994. Endangered and threatened wildlife and plants; Determination of endangered status for the Conservancy fairy shrimp, longhorn fairy shrimp, and the vernal pool tadpole shrimp; and threatened status for the vernal pool fairy shrimp; Final Rule 59 FR 48136-48153.

U.S. Fish and Wildlife Service (USFWS). 1996. Programmatic Formal Endangered Species Act Consultation on Issuance of 404 Permits for Projects with Relatively Small Effects on Listed Vernal Pool Crustaceans Within the Jurisdiction of the Sacramento Field Office, California. February 28, 1996.

U.S. Fish and Wildlife Service (USFWS). 1997. Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo Counties, California. November 13, 1997.

U.S. Fish and Wildlife Service (USFWS). 2004. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the California Tiger Salamander; and Special Rule Exemption for Existing Routine Ranching Activities; Final Rule. Federal Register, Volume 69, Number 149 (Page 47211 47248).

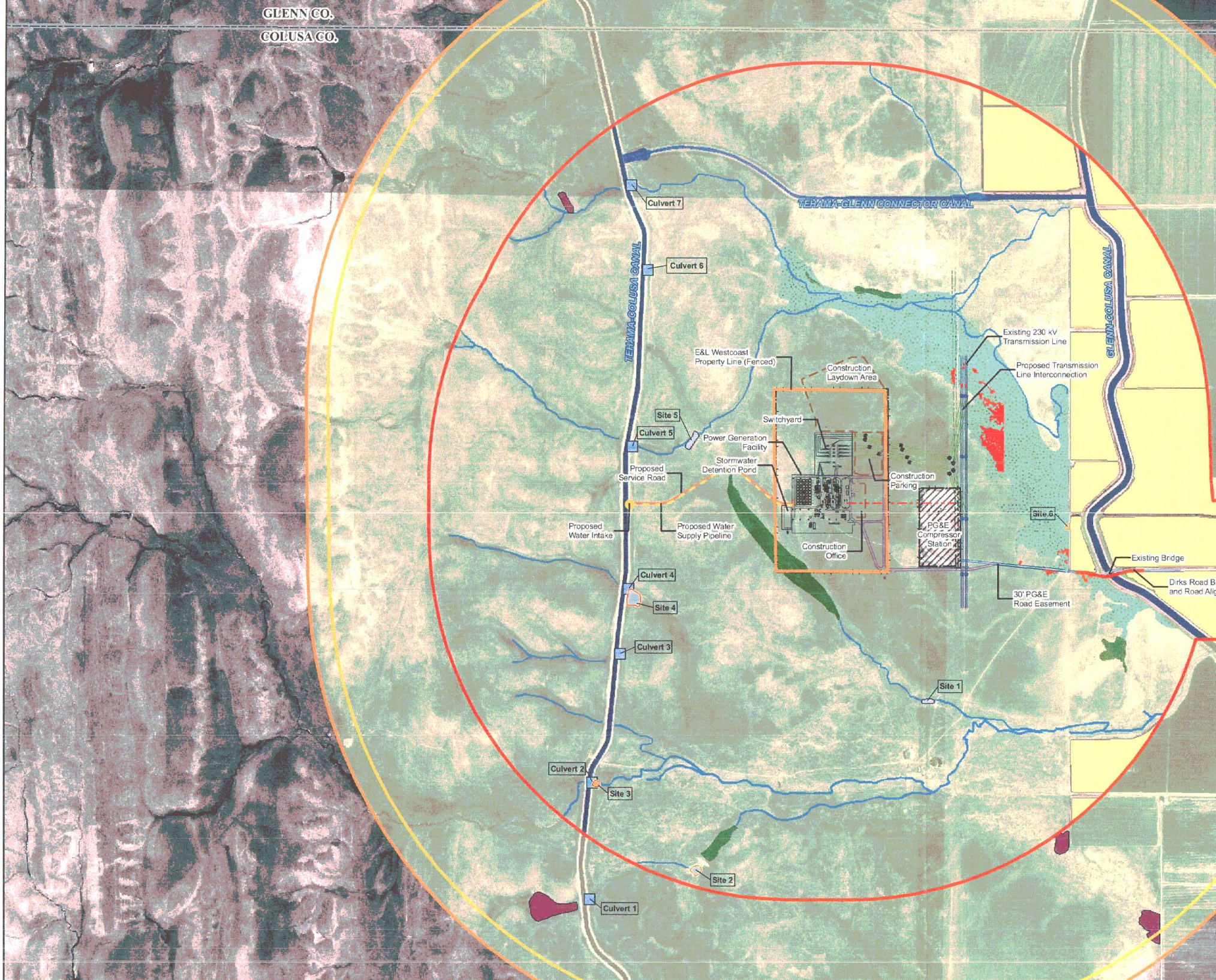
U.S. Fish and Wildlife Service (USFWS). 2005. Designation of Critical Habitat for the California Tiger Salamander. Final Rule. Federal Register 70: 49379-49458. August 23.

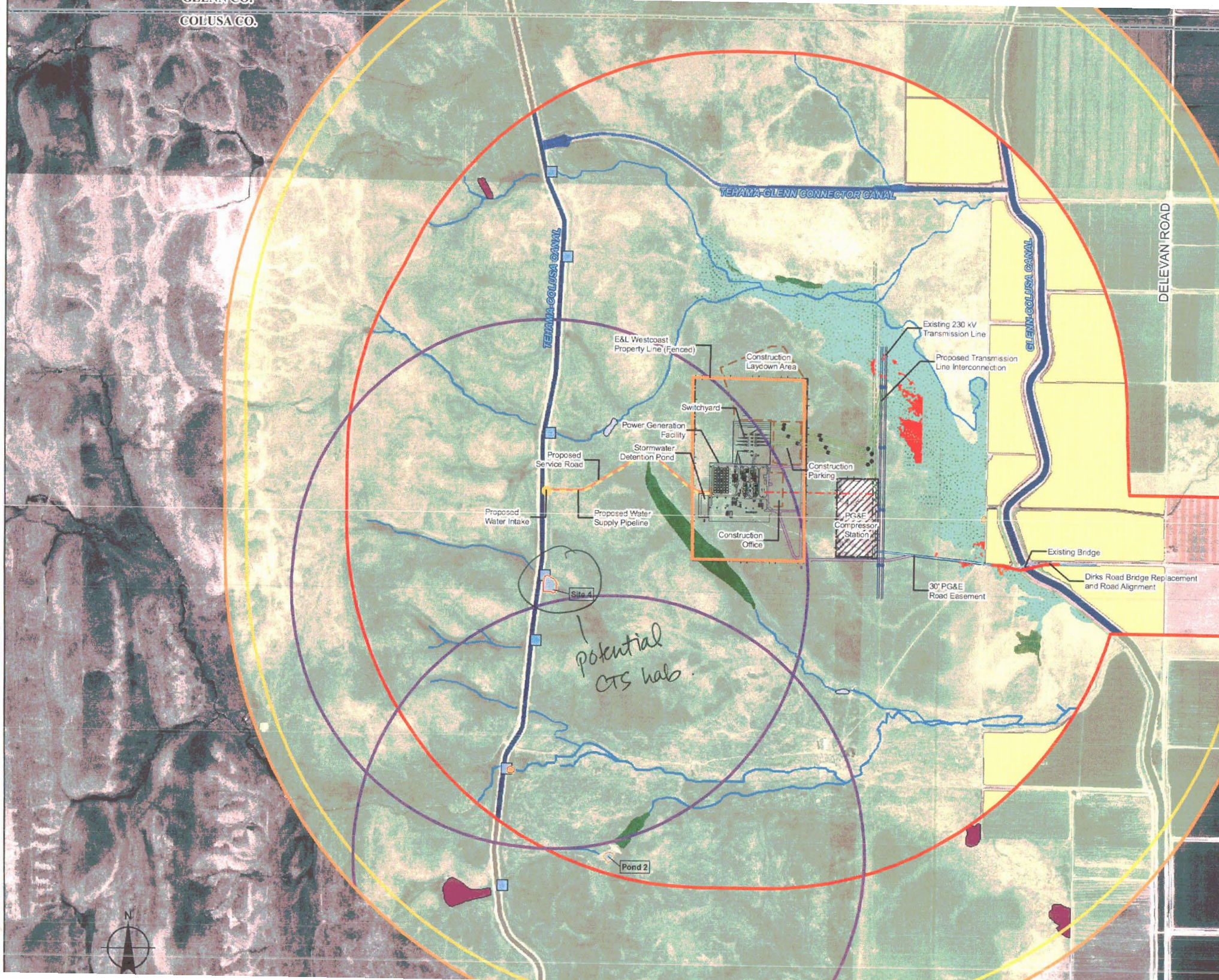
U.S. Fish and Wildlife Service (USFWS). 2006. Endangered and Threatened Wildlife and Plants: Threatened Status for Southern Distinct Population Segment of North American Green Sturgeon. Federal Register 71: 17757-17766. April 7.

U.S. Fish and Wildlife Service (USFWS). 2007. Endangered and Threatened Wildlife and Plants; Adding Four Marine Taxa to the List of Endangered and Threatened Wildlife. Federal Register 72: 16284-16286. April 4.

World Climate. 2007. Buttle and Tuttle, LTD. Website: http://www.worldclimate.com/. Accessed June 2007.

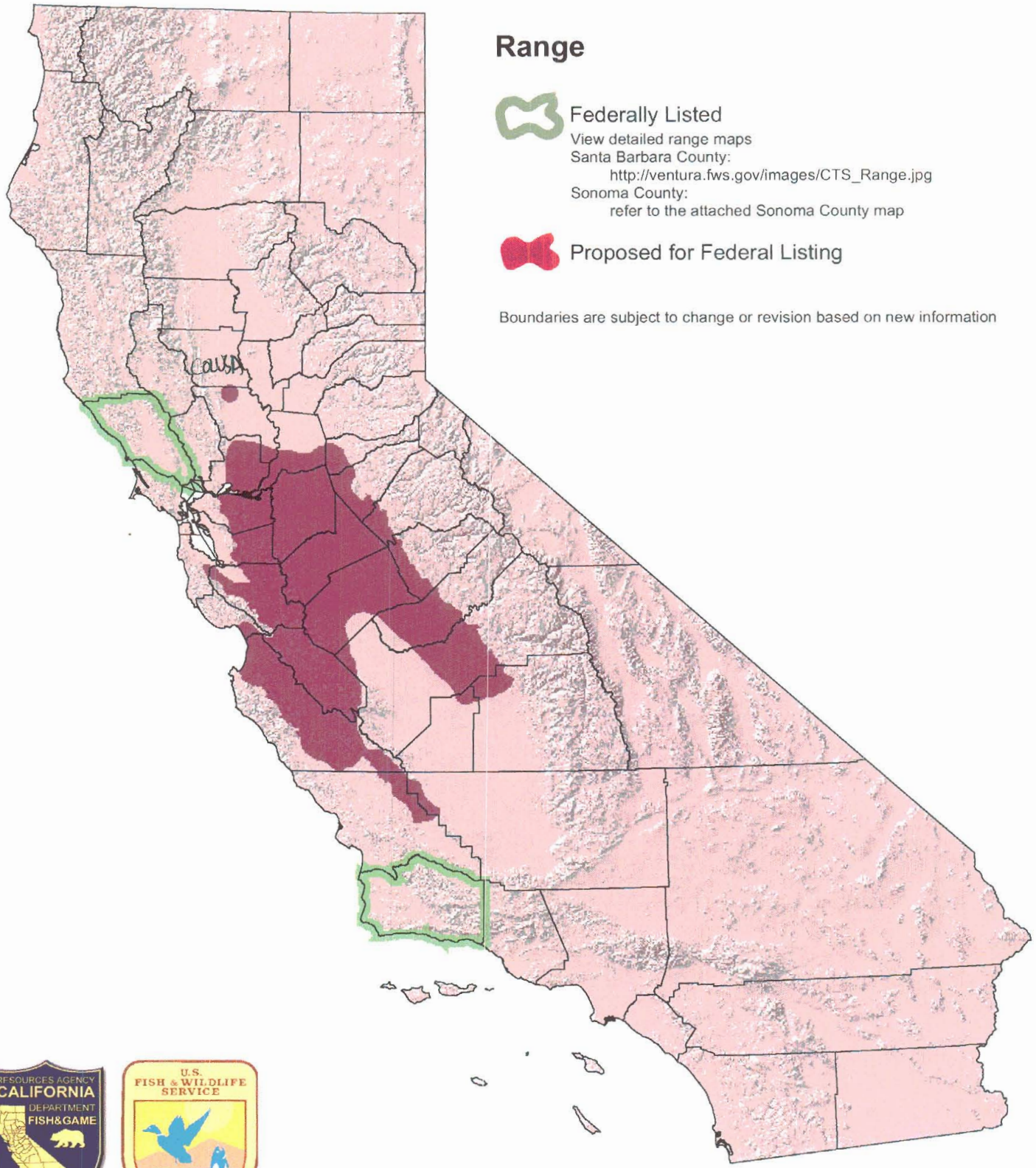
Wulder, Mike. 2007. Personal communication between URS biologist Melissa Newman and Delevan National Wildlife Refuge biologist Mike Wulder regarding potential presence of CTS at the Refuge. April 26, 2007.


GLENN CO.
COLUSA CO.
TEHAMA-COLUSA CANAL
TEHAMA-GLENN CONNECTOR CANAL
GLENN-COLUSA CANAL
Culvert 7
Culvert 6
Culvert 5
Culvert 4
Culvert 3
Culvert 2
Culvert 1
Site 5
Site 4
Site 3
Site 2
Site 1
Site 6
E&L Westcoast Property Line (Fenced)
Construction Laydown Area
Switchyard
Power Generation Facility
Stormwater Detention Pond
Proposed Service Road
Proposed Water Intake
Proposed Water Supply Pipeline
Construction Parking
Construction Office
PG&E Compressor Station
Existing 230 kV Transmission Line
Proposed Transmission Line Interconnection
30' PG&E Road Easement
Existing Bridge
Dirks Road B
and Road Alig


GLENN CO.
COLUSA CO.
TEHAMA-GLENN CONNECTOR CANAL
TEHAMA-COLUSA CANAL
GLENN-COLUSA CANAL
DELEVAN ROAD
E&L Westcoast Property Line (Fenced)
Construction Laydown Area
Existing 230 kV Transmission Line
Proposed Transmission Line Interconnection
Switchyard
Power Generation Facility
Stormwater Detention Pond
Proposed Service Road
Construction Parking
Proposed Water Intake
Proposed Water Supply Pipeline
PG&E Compressor Station
Construction Office
Existing Bridge
Dirks Road Bridge Replacement and Road Alignment
30' PG&E Road Easement
Site 4
potential CTS hab.
Pond 2
N

Attachment A – CTS Range Map

Generalized Range Map of California Tiger Salamander
(Ambystoma californiense)



WHDAB:KFIEN 10/23/03

Attachment B – Photographs

Attachment B – Photographs

Photo 1. Picture of **Site 1** in March 2007. This stock pond was dry in both March and April 2007.

Photo 2. Close up view of Site 1 in April 2007.

Attachment B – Photographs

Photo 3. Area directly east of Site 1 contained stagnant water in March 2007, but was dry in April 2007 (see photo 4). Site 1 can be seen in upper left hand corner of this photo.

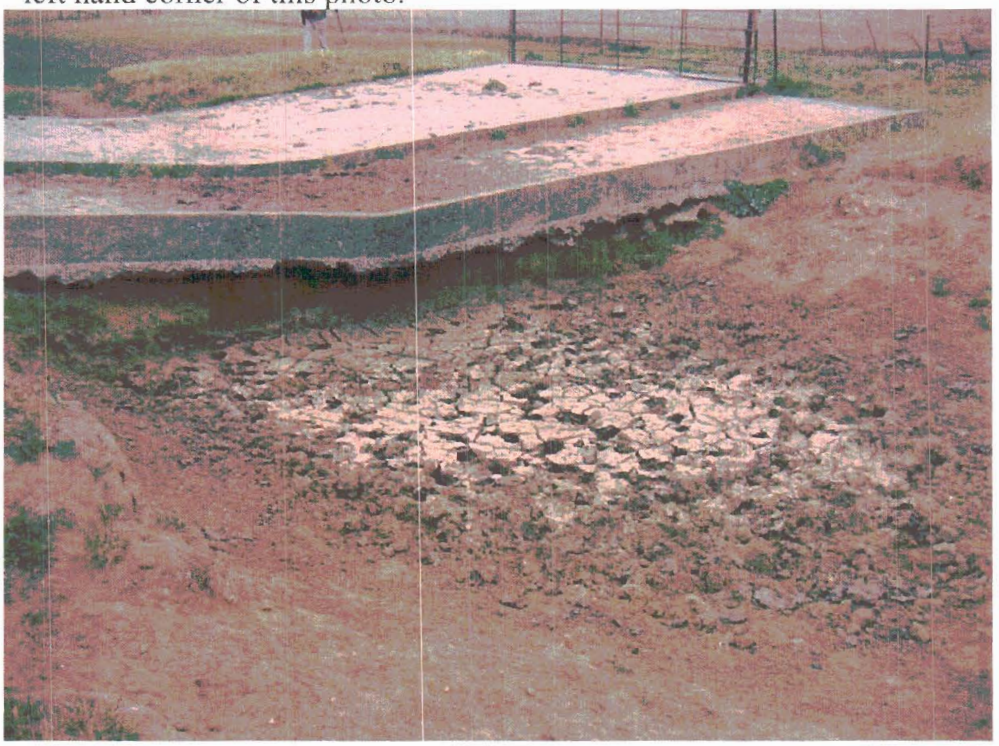


Photo 4. Area directly east of Site 1 was dry in April 2007.

Attachment B – Photographs

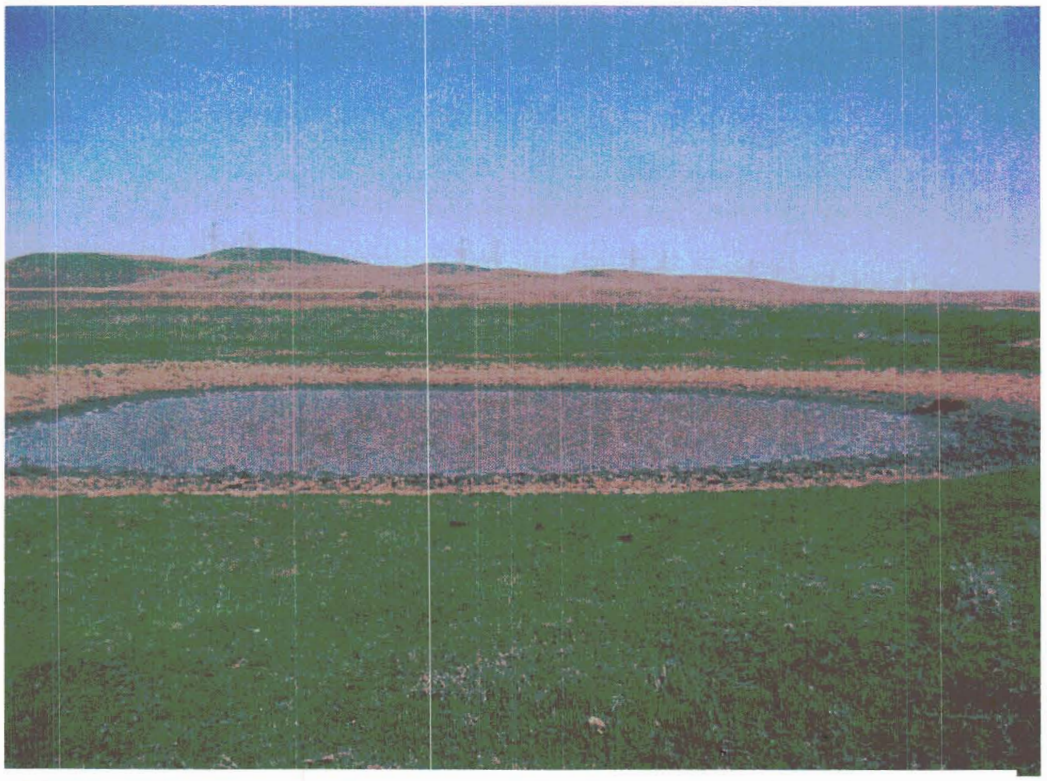


Photo 5. Picture of **Site 2** in March 2007. This stock pond was inundated in March 2007 but not in April 2007 (see photo 7).

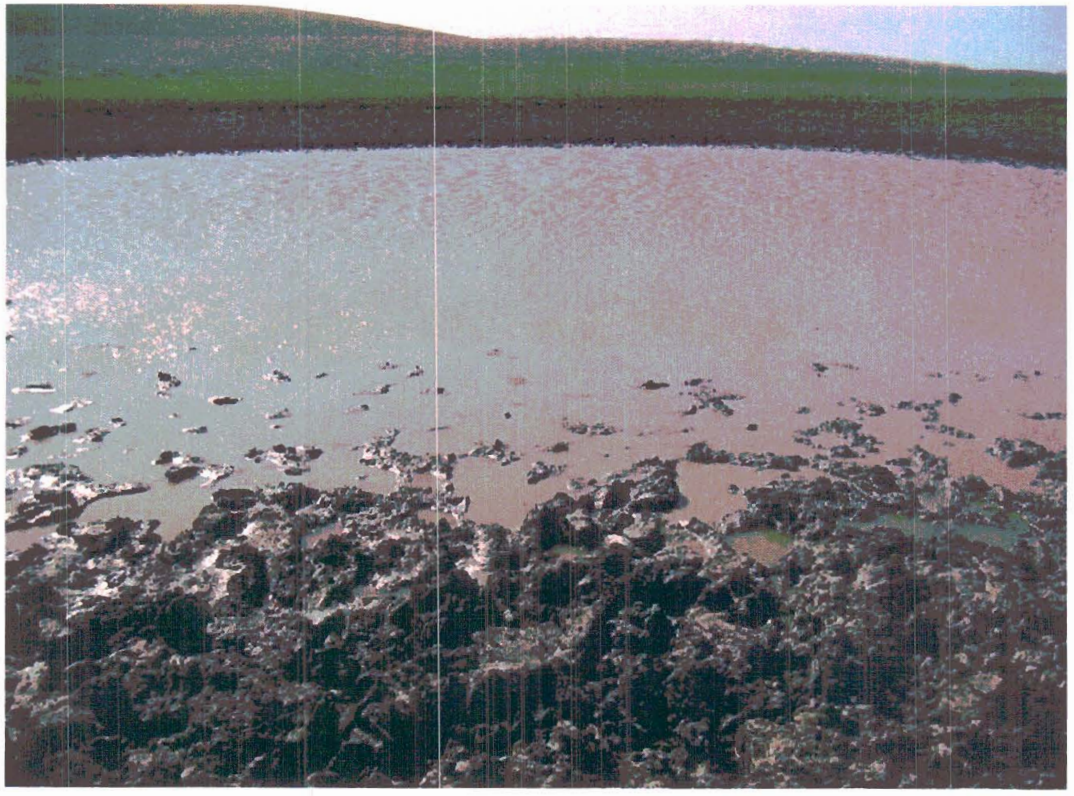


Photo 6. Close up view of Site 2 in March 2007.

Attachment B – Photographs

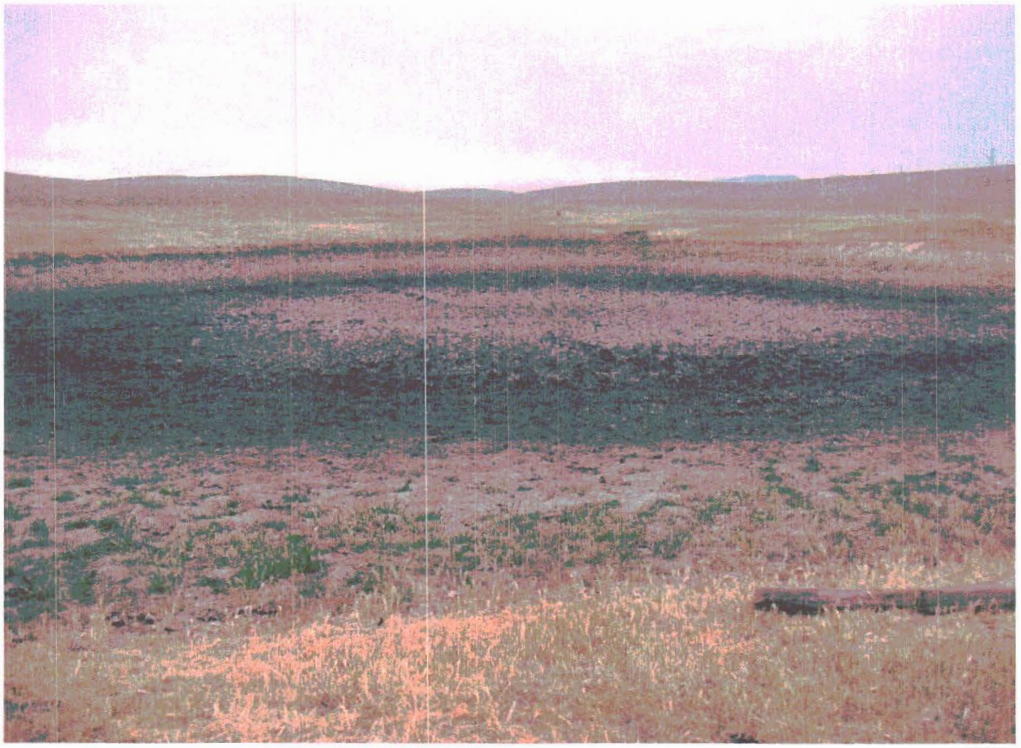


Photo 7. Site 2 in April 2007.

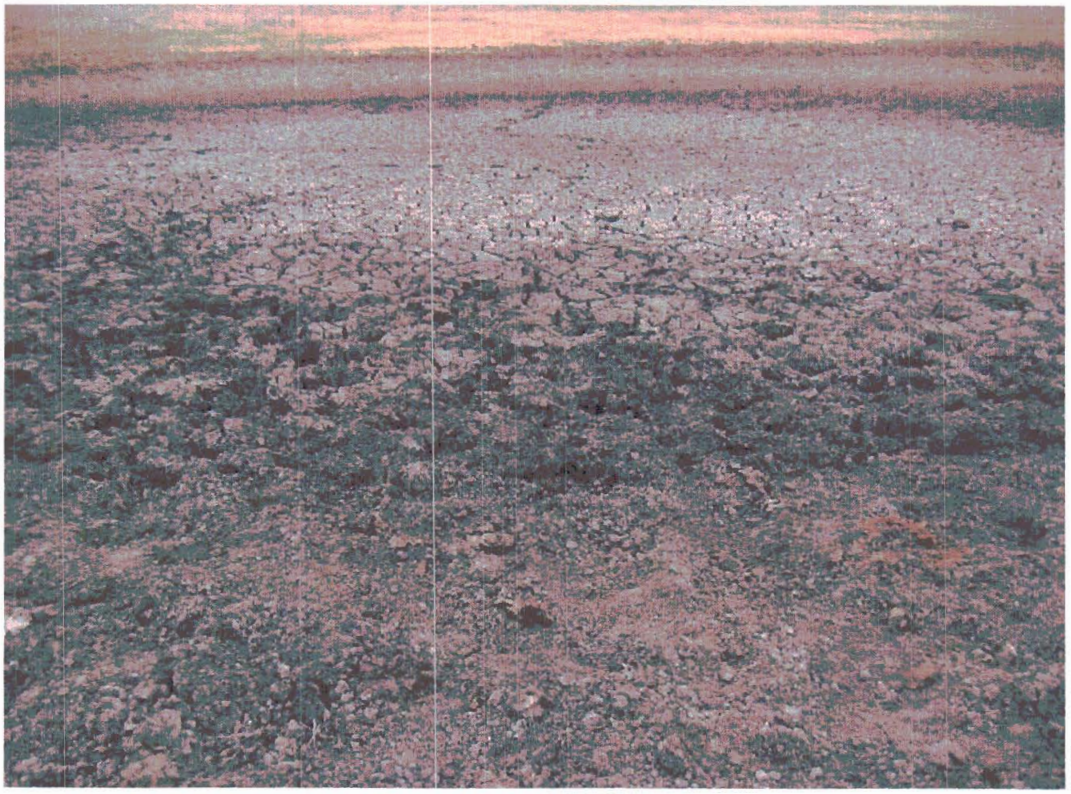


Photo 8. Close up view of Site 2 in April 2007.

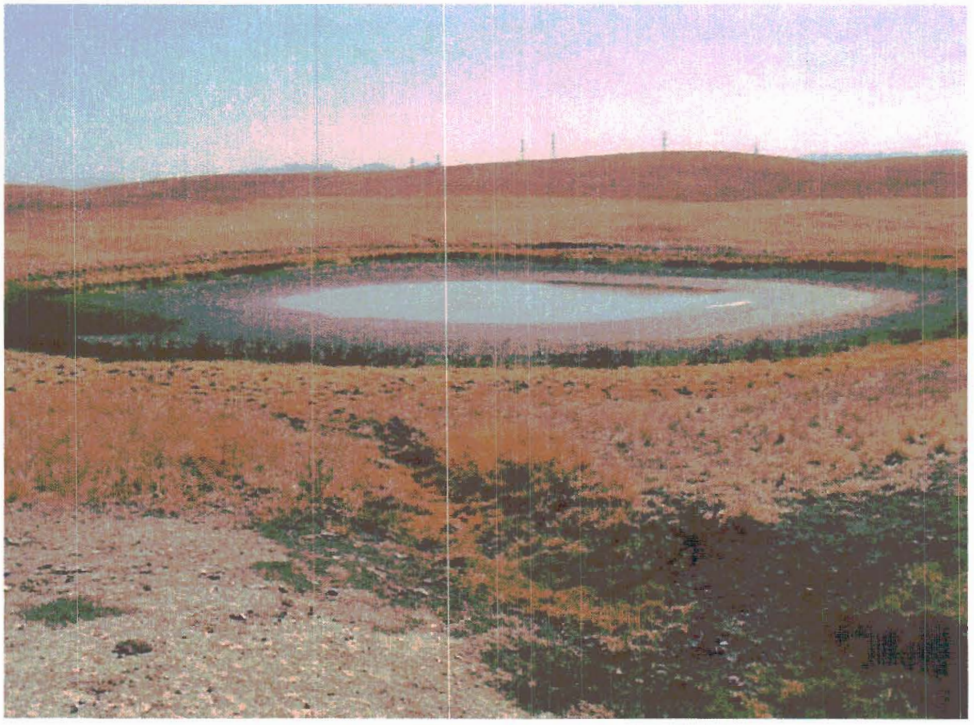


Photo 9. Site 2 in August 2006.

Photo 10. **Culvert 1** in April 2007.

Attachment B – Photographs

Photo 11. **Site 3** and **Culvert 2** in April 2007.

Photo 12. **Culvert 3** in April 2007.

Attachment B – Photographs

Photo 13. **Site 4** and **Culvert 4** in April 2007. This pond provides habitat that is suitable for breeding California tiger salamander.

Photo 14. Close up view of **Site 4**.

Photo 15. **Culvert 5**.

Photo 16. **Culvert 6**.

Photo 17. **Culvert 7**.

Photo 18. **Site 5** in March 2007. This stock pond was dry in both March and April 2007 (see photo 19 below).

Attachment B – Photographs

Photo 19. Site 5 in April 2007.

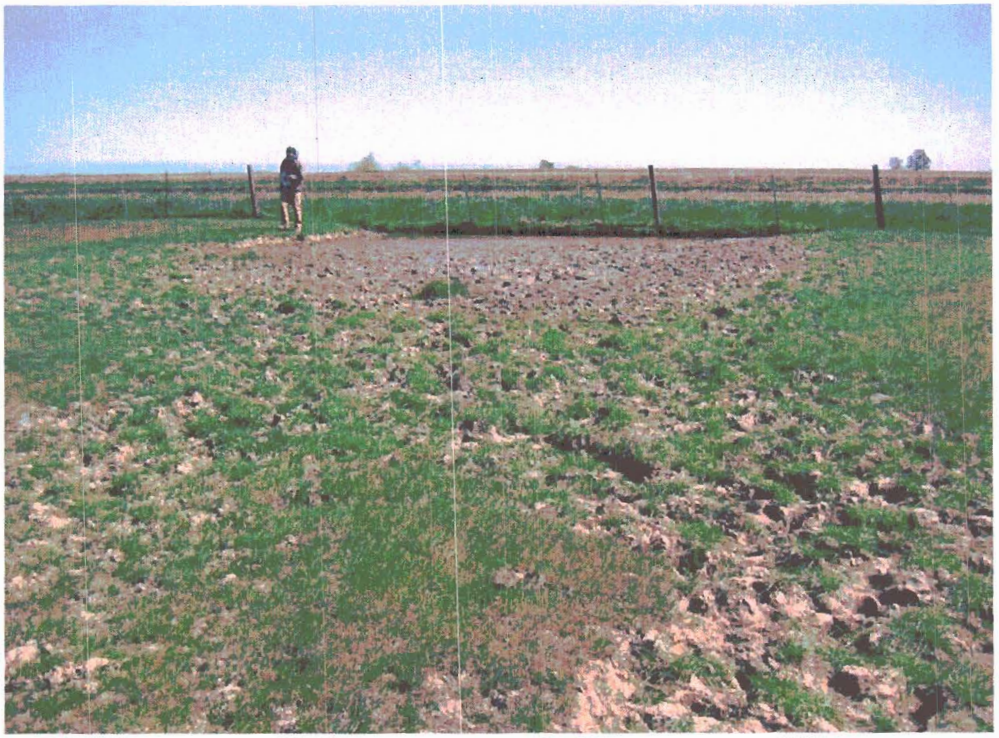


Photo 20. **Site 6** in March 2007. This pond, located within the vernal pool grassland complex, was ponded in March 2007 but not in April 2007 (see photo 21).

Attachment B – Photographs

Photo 21. Site 6 contained stagnant water with predatory diving beetles in March 2007.

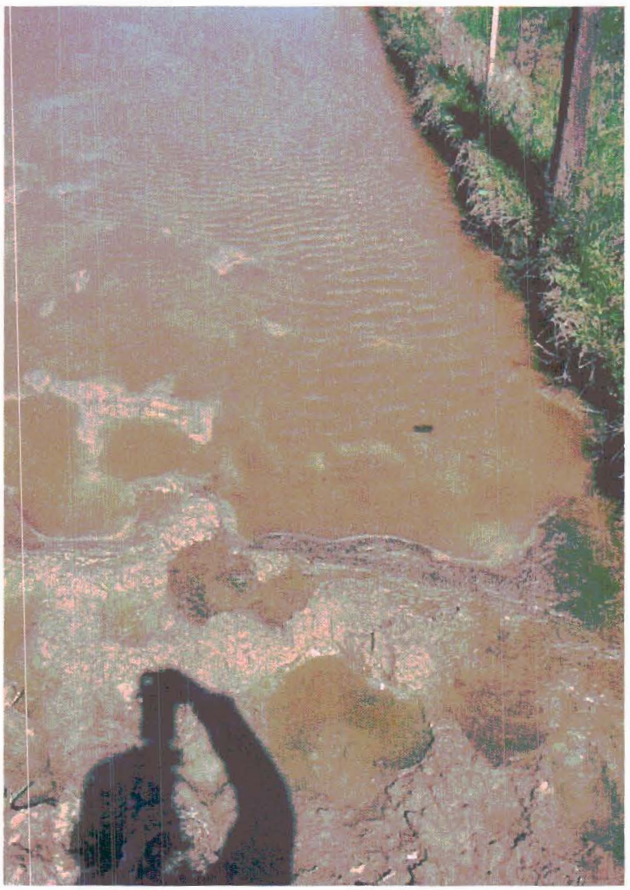


Photo 22. Site 6 was dry in April 2007.

Attachment B – Photographs

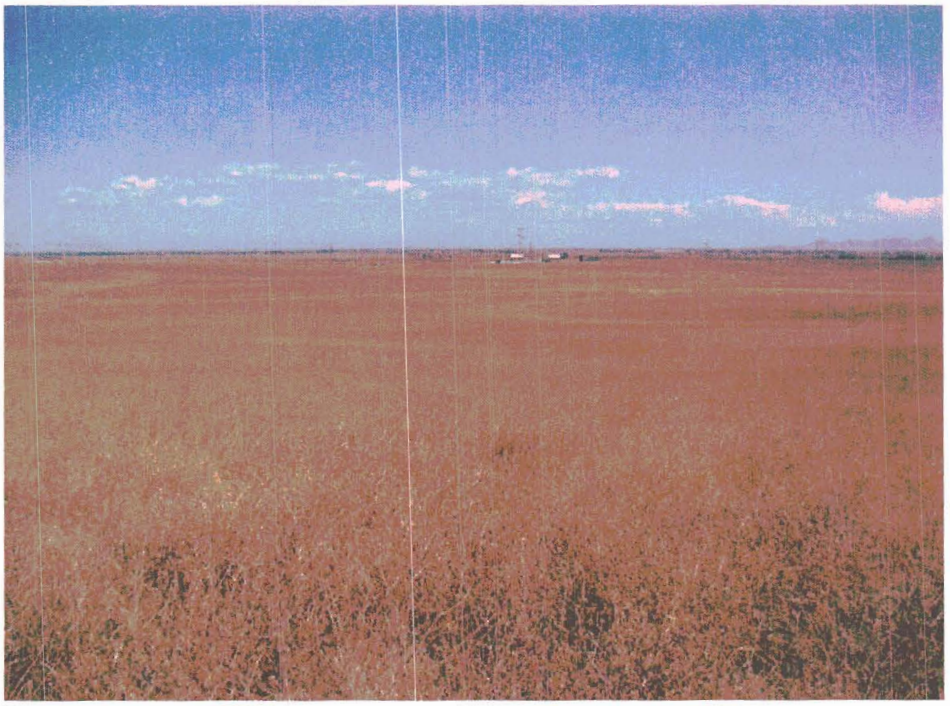


Photo 23. Photo taken October 2006. Yellow star thistle is widespread throughout project site and vicinity.

Photo 24. Pit ALK-6 in the alkali grassland habitat southwest of the proposed plant site. Photograph taken March 2007.

Attachment B – Photographs

Photo 25. View looking south of Pit ALK-6 on March 2007.

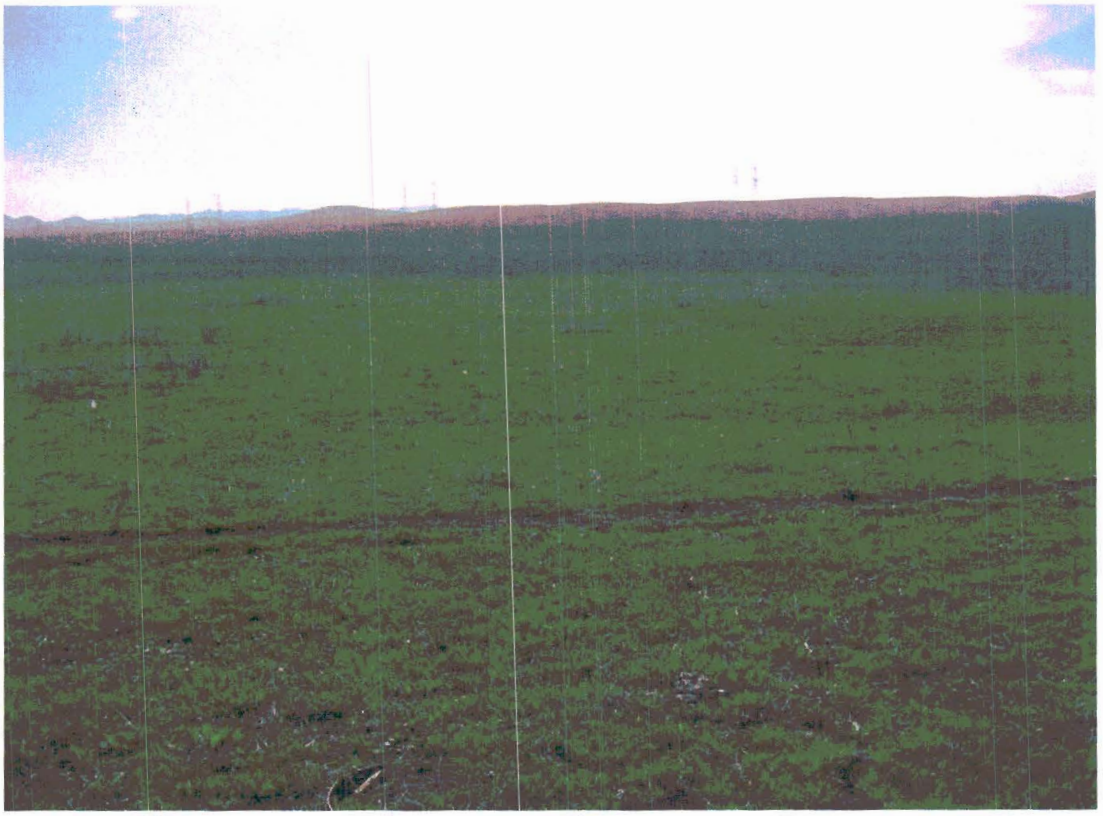


Photo 26. View of a portion of the alkali grassland habitat that is located southwest of the proposed plant site. Photograph taken March 2007.

Photo 27. Glenn-Colusa Irrigation District Canal.

Photo 28. Teresa Creek.

Attachment B – Photographs

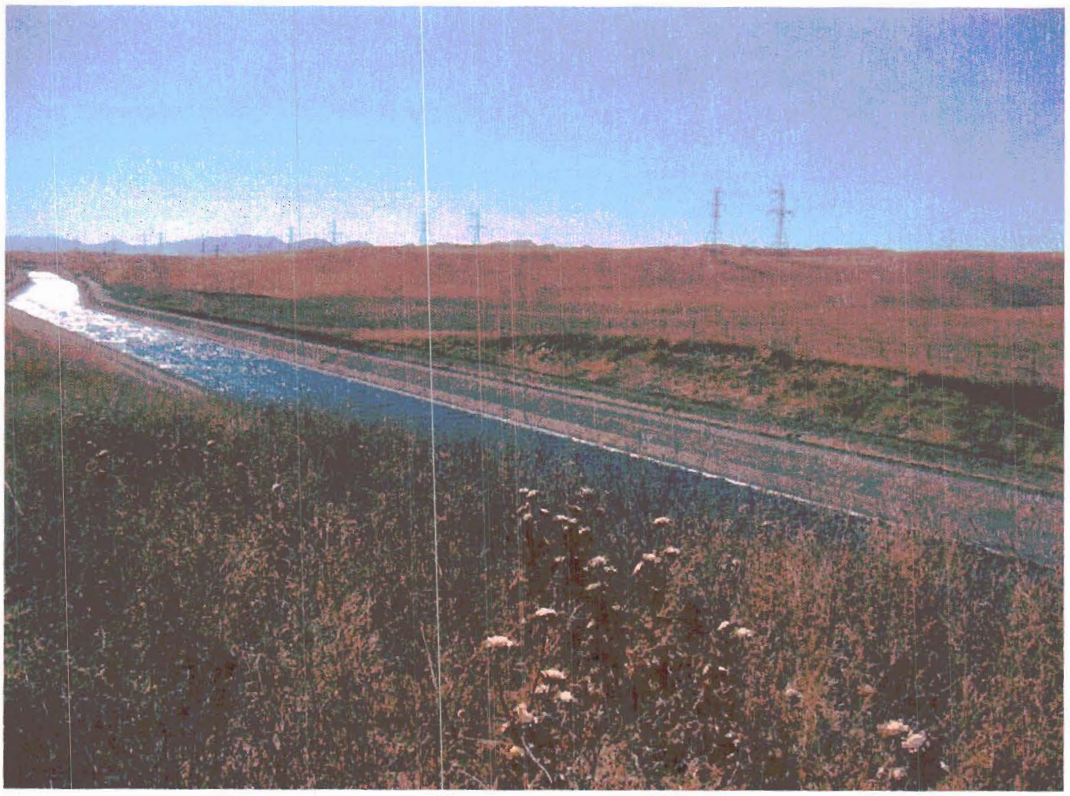


Photo 29. Tehama-Colusa Canal.

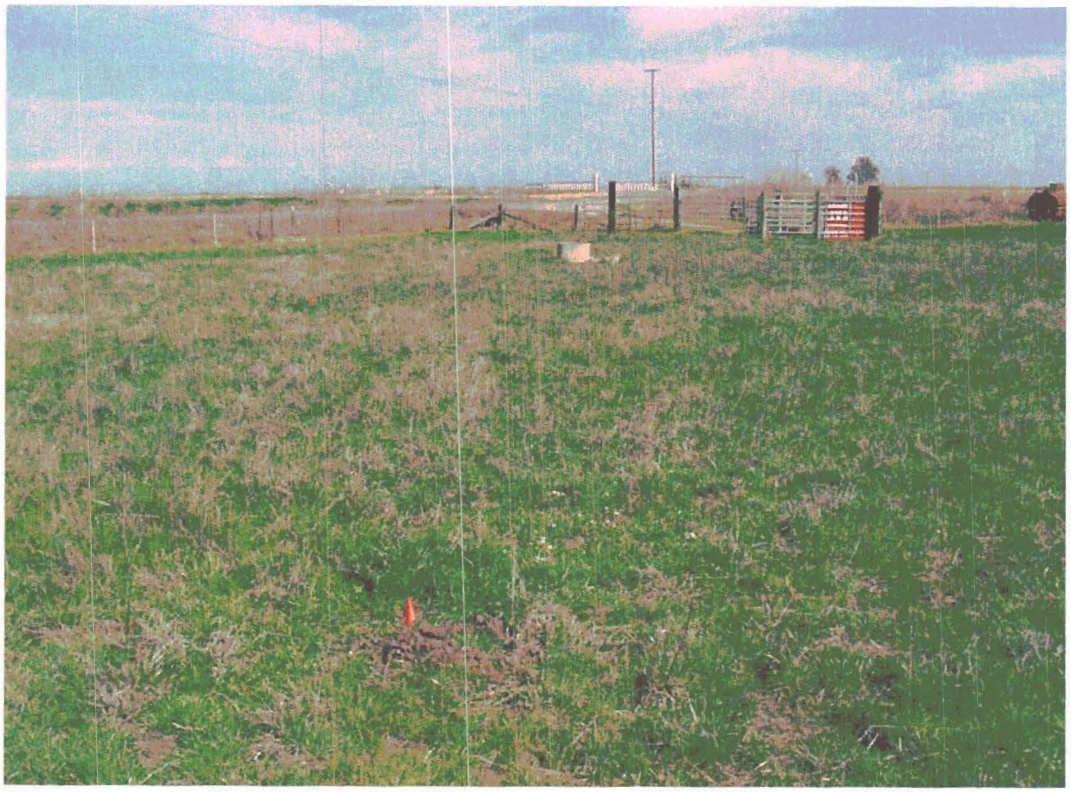


Photo 30. Seasonal wetland habitat south of existing PG&E access road.

Attachment B – Photographs

Photo 31. Seasonal wetland habitat south of existing PG&E access road.