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. 1. 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-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

Pond 2

Hunter's Creek

DIRKS ROAD

Teresa Creek

McDERMOTT ROAD

DELEVAN ROAD

N

0 500 1,000 1,500 2,000

SCALE IN FEET

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

LEGEND

Biological Resources

- Biological Study Area
- 1.24 mi Buffer from Project Fence
- 1.3 mi Buffer from Project Fence
- 0.7 mi Buffer - Potential High-Quality CTS Aestivation Habitat

Existing Features

- Existing Bridge
- Existing Lattice Tower
- Existing Road
- Existing 230 kV Transmission Line
- Existing Natural Gas Pipeline

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

Aquatic and Wetland Habitats

- Canal
- Freshwater Marsh
- Perennial Stream (Teresa Creek)
- Seasonal Stream
- Pond
- Stock Pond
- Possible Stock Pond
- Ponded on March 21, 2007
- Ponded in both March and April 2007
- Vernal Pool
- Seasonal Wetland
- Rice
- Irrigation Ditch
- Culverts

Upland Habitats

- Alkali Grassland
- Vernal Pool Grassland
- California Annual Grassland
- Disturbed
- Disked Field
- Developed
- Tomatoes/Row Crops

POTENTIAL AESTIVATION HABITAT FOR CA TIGER SALAMANDER NEAR SITES 2 & 4

28067004
August 2007

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

URS

Figure 2

L:\Projects\Colusa_28067004\MXD\Current Working Documents\figure_2_CTS_potential_habitat.mxd

GLENN CO.

COLUSA CO.

TEHAMA-COLUSA CANAL

Culvert 7

Culvert 6

Culvert 5

Culvert 4

Culvert 3

Culvert 2

Culvert 1

TEHAMA-GLENN CONNECTOR CANAL

GLENN-COLUSA CANAL

DELEVAN ROAD

E&L Westcoast Property Line (Fenced)

Construction Laydown Area

Existing 230 kV Transmission Line

Proposed Transmission Line Interconnection

Site 5

Switchyard

Power Generation Facility

Stormwater Detention Pond

Proposed Service Road

Construction Parking

Site 6

PG&E Compressor Station

Proposed Water Intake

Proposed Water Supply Pipeline

Construction Office

Existing Bridge

Dirks Road Bridge Replacement and Road Alignment

30' PG&E Road Easement

Site 4

Site 1

Site 3

Site 2

Hunter's Creek

DIRKS ROAD

Teresa Creek

McDERMOTT ROAD

DELEVAN ROAD

LEGEND

Biological Resources

- Biological Study Area
- 1.24 mi Buffer from Project Fence
- 1.3 mi Buffer from Project Fence

Existing Features

- Existing Bridge
- Existing Lattice Tower
- Existing Road
- Existing 230 kV Transmission Line
- Existing Natural Gas Pipeline

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

Aquatic and Wetland Habitats

- Canal
- Freshwater Marsh
- Perennial Stream (Teresa Creek)
- Seasonal Stream
- Pond
- Stock Pond
- Possible Stock Pond
- Ponded on March 21, 2007
- Ponded in both March and April 2007
- Vernal Pool
- Seasonal Wetland
- Rice
- Irrigation Ditch
- Culverts

Upland Habitats

- Alkali Grassland
- Vernal Pool Grassland
- California Annual Grassland
- Disturbed
- Disked Field
- Developed
- Tomatoes/Row Crops

N

0 500 1,000 1,500 2,000

SCALE IN FEET

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

L:\Projects\Colusa_28067004\MXD\Current Working Documents\figure_1_CTS_habitat_assess_surveys.mxd

CALIFORNIA TIGER SALAMANDER HABITAT ASSESSMENT SURVEYS

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

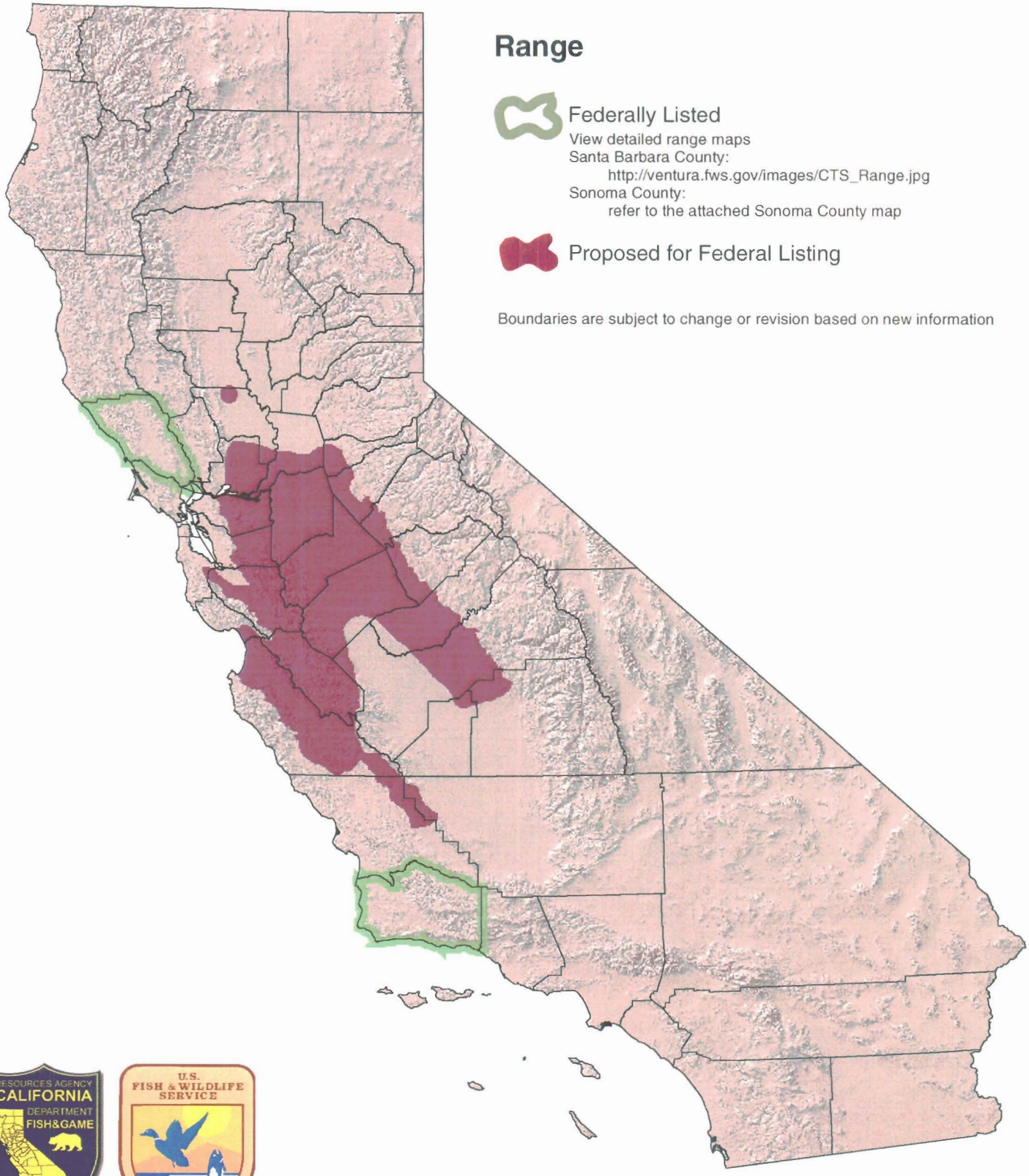
28067004
August 2007

URS

Figure 1

Attachment A – CTS Range Map

Generalized Range Map of California Tiger Salamander
(Ambystoma californiense)



Range

Federally Listed

View detailed range maps
Santa Barbara County:
http://ventura.fws.gov/images/CTS_Range.jpg
Sonoma County:
refer to the attached Sonoma County map

Proposed for Federal Listing

Boundaries are subject to change or revision based on new information

RESOURCES AGENCY CALIFORNIA DEPARTMENT FISH&GAME

U.S. FISH & WILDLIFE SERVICE
DEPARTMENT OF THE INTERIOR

WHDAB:KFIEN 10/23/03

Attachment B – Photographs

Attachment B – Photographs

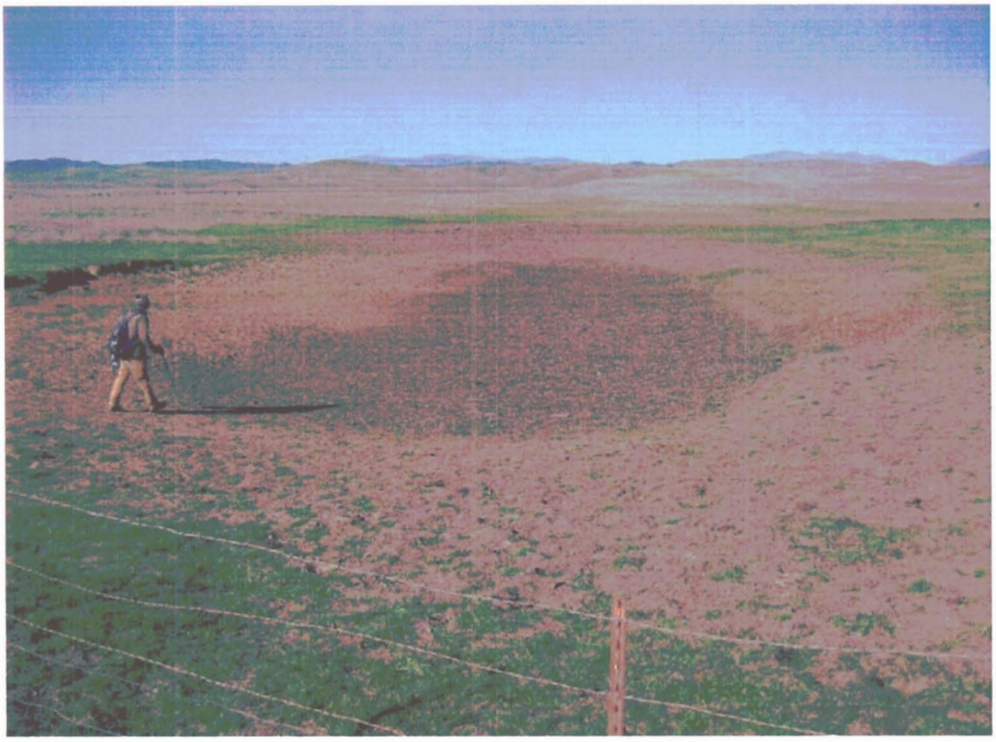


Photo 1. Picture of **Site 1** in March 2007. This stock pond was dry in both March and April 2007.

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.

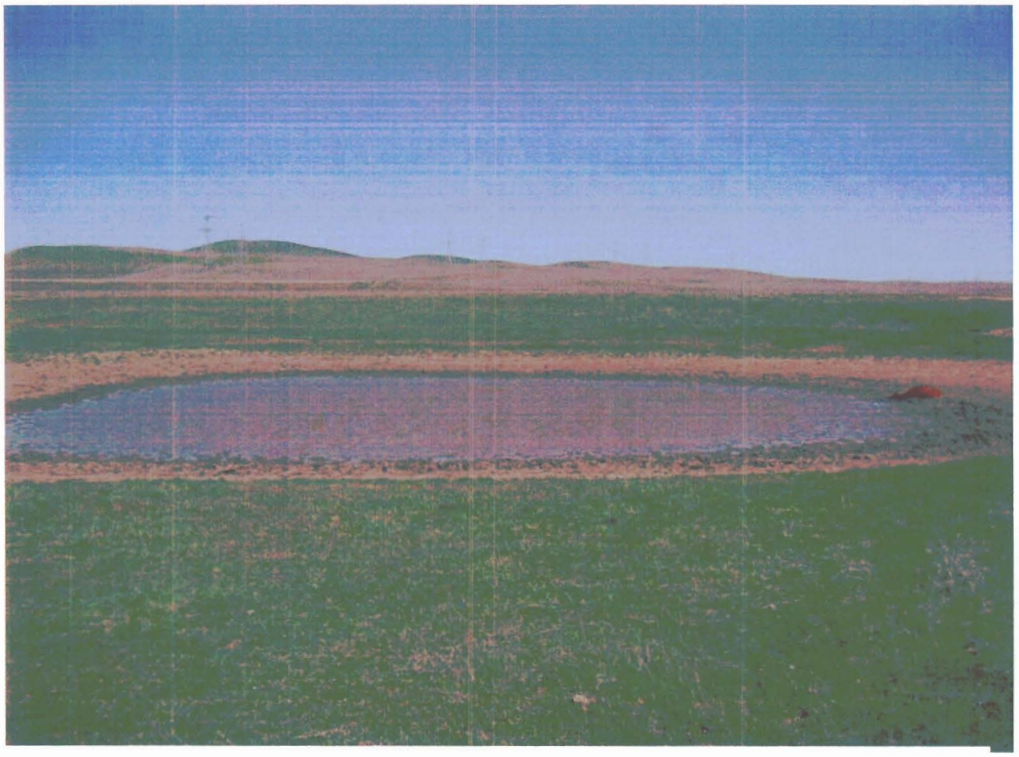


Photo 5. Picture of **Site 2** in March 2007. This stock pond was inundated in March 2007 but not in April 2007 (see photo 7).

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

Attachment B – Photographs

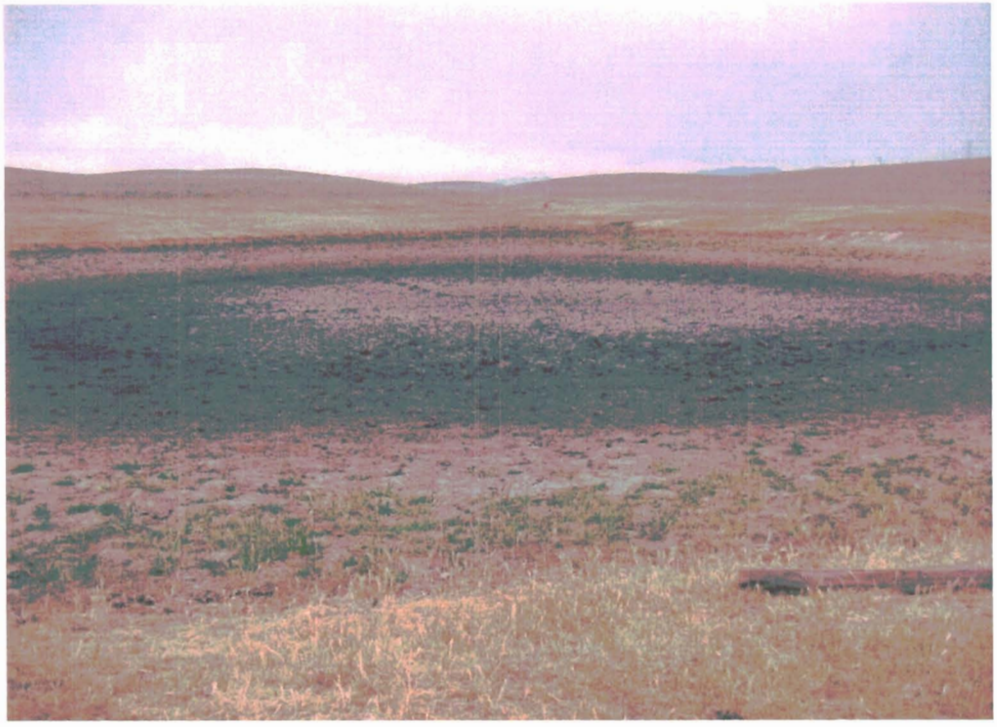


Photo 7. Site 2 in April 2007.

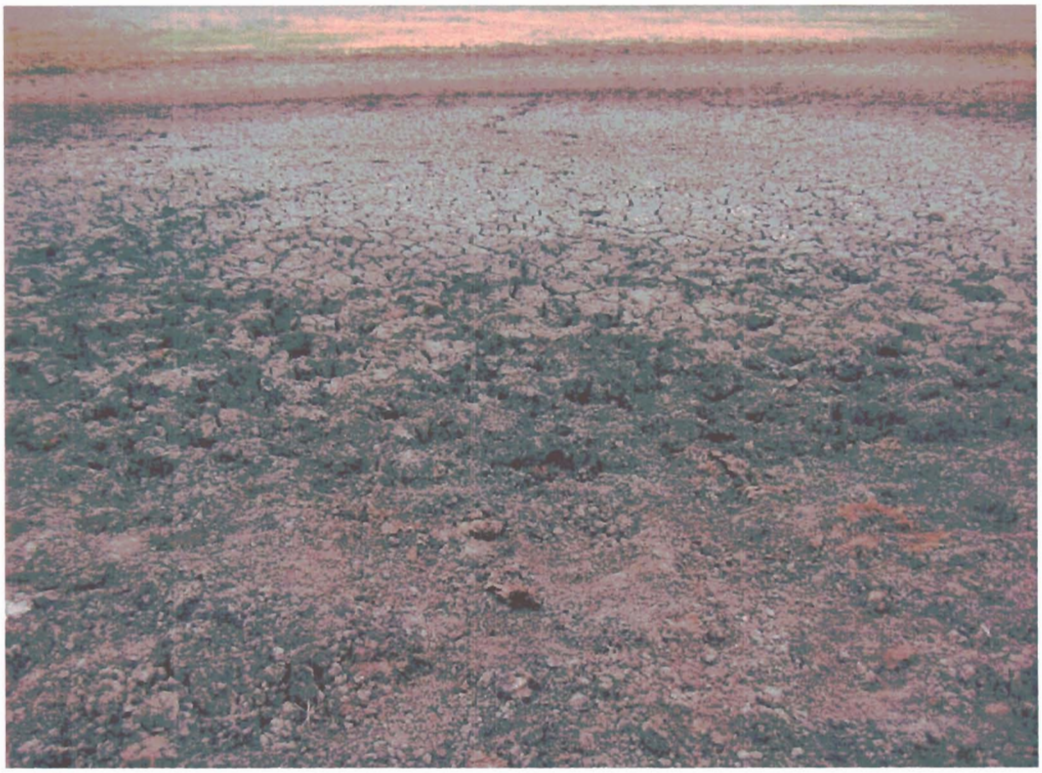


Photo 8. Close up view of Site 2 in April 2007.

Photo 9. Site 2 in August 2006.

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

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

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

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).

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.

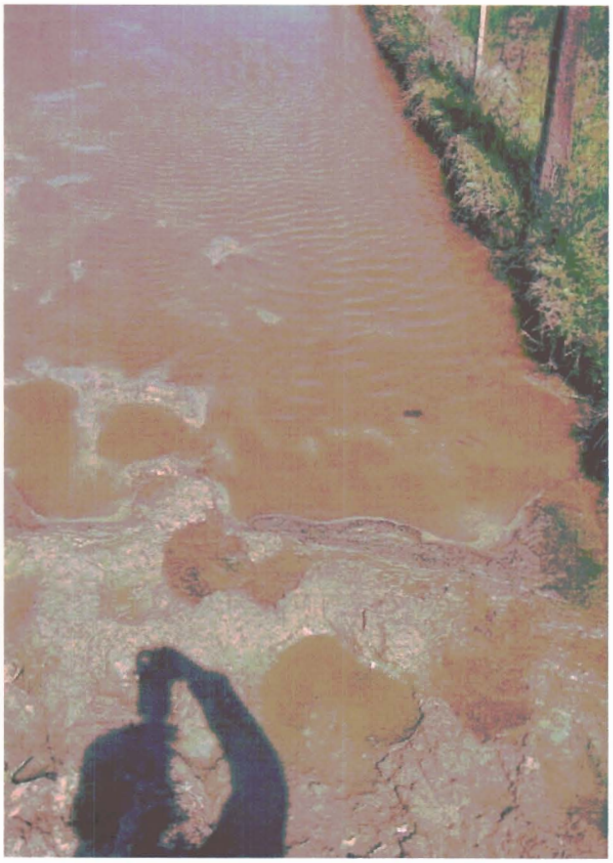


Photo 22. Site 6 was dry in April 2007.

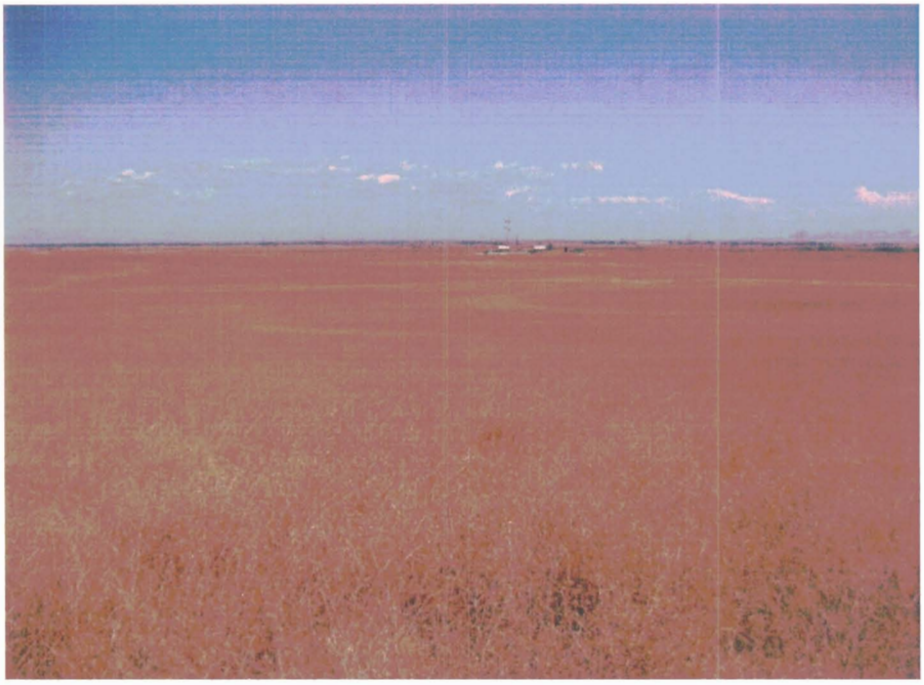


Photo 23. Photo taken October 2006. Yellow star thistle is widespread throughout project site and vicinity.

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

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.