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**Results of Focused Surveys for
Unarmored Threespine Stickleback
and Special-Status Fish Species;
Castaic Mesa, Castaic Creek
Los Angeles County, California**

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**Results of Focused Surveys for Unarmored Threespine Stickleback
and Special-Status Fish Species
Castaic Mesa, Castaic Creek
Los Angeles County, California**

This report presents the findings of focused protocol surveys that were conducted in May 2003 to determine the presence/absence of the federally- and state-listed endangered unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*) (herein UTS) in portions of Castaic Creek in Los Angeles County. This report is intended to provide project specific biological information to Newhall Ranch Company, US Army Corps of Engineers (ACOE), US Fish and Wildlife Service (USFWS), and California Department of Fish and Game (DFG) regarding presence/absence of unarmored threespine stickleback and additional special-status fish species including arroyo chub (*Gila orcutti*) and Santa Ana sucker (*Catostomus santaanae*) identified within the subject survey reaches.

INTRODUCTION

The survey area is located in western Los Angeles County, west of the City of Valencia (**Figure 1**). Specifically, the site is situated at R17W, T5N, in Section 25 on the Newhall, California US Geological Survey (USGS) 7.5-Minute Quadrangle Map (**Figure 2**). All sample sites selected were within potentially suitable habitats in portions of Castaic Creek from the Castaic Lagoon outfall, south (downstream) approximately 5,000 linear feet. The primary purpose of these surveys was to determine current distribution of the UTS (if present). The secondary purpose was to determine the presence/absence and current distribution of other special-status fish species including the Santa Ana sucker and the Arroyo chub.

General UTS Background

Sticklebacks are a small (rarely exceeding 2.4 inches) streamline fish with two isolated dorsal spines, with a third, smaller spine at the front edge of the soft-rayed portion of the dorsal fin (USFWS 1985). Additional distinctive features include the unusual pelvic girdle that includes a spine on both sides, and the bright nuptial coloration of the male. The male stickleback builds a nest of fine plant debris and algal strands where it courts females that enter its territory. Several females may deposit eggs in a single nest. The males care for and protect the eggs and young. Sticklebacks are apparently an annual species, surviving for only one year (USFWS 1985), though some local scientists believe some individuals may live more than one year.

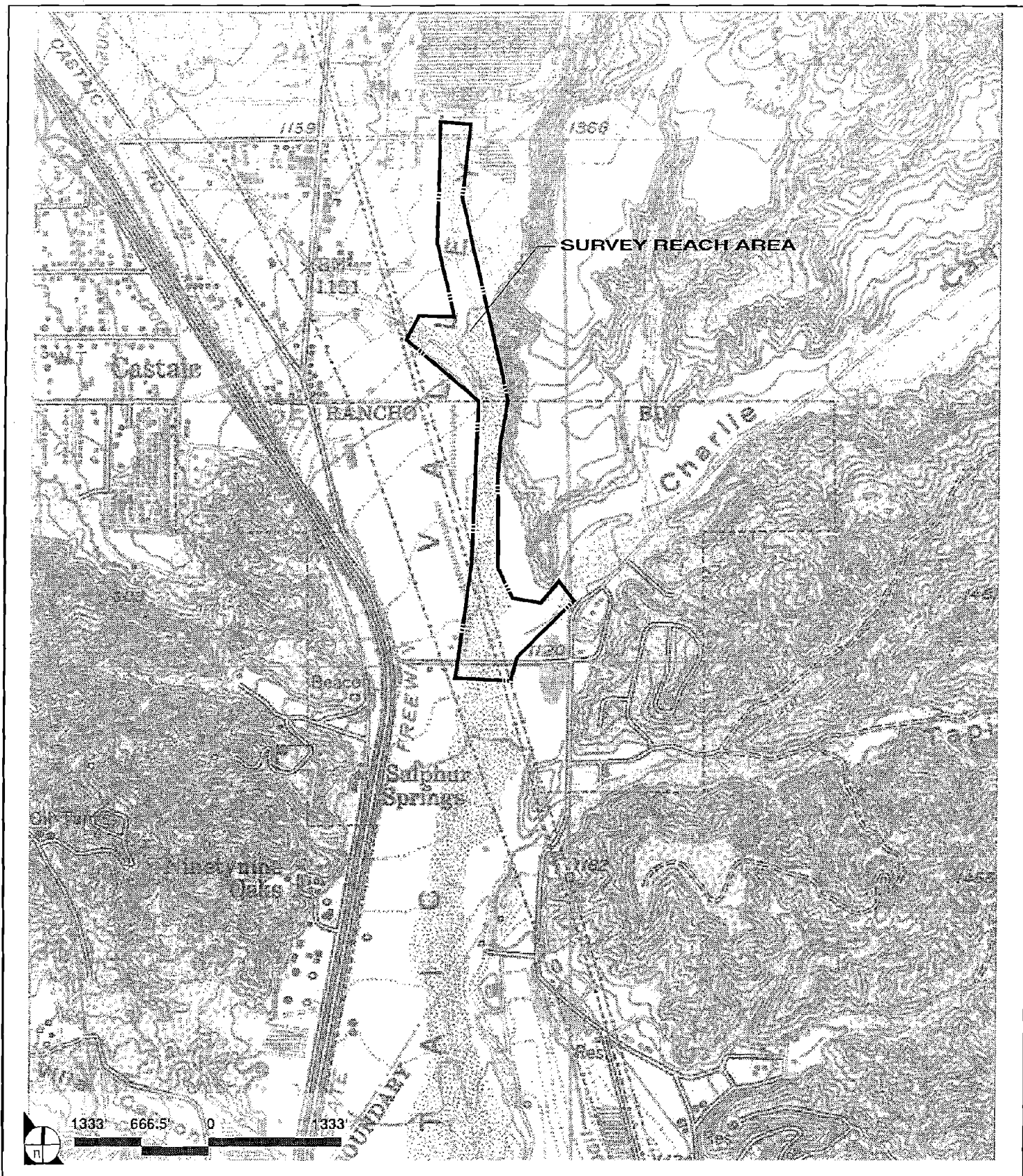


FIGURE 2

Survey Reach

Three morphologically distinct subspecies of threespine stickleback (*Gasterosteus aculeatus*) occur in California. Two of these, the semi-armored (*G. a. microcephalus*) and the subject unarmored subspecies (*G. a. williamsoni*) occur in the Santa Clara River system. The number of, or absence of, bony lateral plates is the primary characteristic in differentiating the subspecies. The fully armored subspecies (*G. a. aculeatus*) typically has a row of bony plates that extends the full length of both sides of its lateral surface from above the gill plate to the base of the caudal fin. Lateral plates on the semi-armored subspecies do not extend the full length (typically less than five plates) and are limited to the anterior portion of the body.

Regional distribution of UTS is thought to have originally included the headwaters of the Santa Clara River, and low gradient portions of the Santa Ana, San Gabriel, and Los Angeles Rivers (USFWS 1985). The latter three populations are now extinct and it is now generally accepted that distribution of the remaining naturally occurring UTS population is limited to the Santa Clara River and its tributaries, east (upstream) and including the juncture with San Martinez Grande Canyon. The USFWS 1985 Revised Recovery Plan also includes a population in the San Antonio Creek drainage in Santa Barbara County and was considering a population in Shay Creek, San Bernardino County. All of these populations are protected by the federal listing. However, more recent genetic data suggest these and another population later discovered in the Baldwin Lake basin are not UTS (Haglund, 1988).

The UTS was listed as an Endangered species by the USFWS in October 1970 (35 Federal Register 16047) and by the State of California in June 1971. A federal Recovery Plan was initially prepared by USFWS in 1977 and a Revised Recovery Plan was prepared in December 1985. Critical habitat was proposed in 1980. However, in September 2002, the USFWS determined that the proposed designation of critical habitat should not be made (67 Federal Register 58580).

Overview of UTS Habitat Characteristics

Breeding, and newly hatched young occur in clean water, along shallow stream edges or braids in dense vegetation, where they are protected from being washed away in the stream current. In these areas the water temperatures are typically warmer, which is thought to increase the speed of development of the young. Larger juveniles and sub-adults (less than 0.8 inches) are also usually observed in the protection of dense vegetation, in slow moving or standing water (USFWS 1985).

Adults have been found in a variety of habitats throughout the river, but tend to occur most frequently in areas of slow or standing water. When occurring in the main stream channel, they tend to seek shelter behind obstructions and under vegetation (USFWS 1985).

Essential Habitat Designation

Critical habitat is not specifically defined in the Recovery Plan for the species. However, it is stated that the designated Essential Habitat coincides with the areas proposed by the USFWS as Critical Habitat (45 Federal Register 76012-76015). In this proposal Critical Habitat is defined as: (1) the specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the Endangered Species Act of 1973 as amended, on which are found those physical or biological features (a) essential to the conservation of the species and (b) that may require special management considerations or protection; and (2) specific areas outside the geographic area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. "Conservation" means the use of all methods and procedures that are necessary to bring an endangered or a threatened species to the point at which listing under the Act is no longer necessary (USFWS, 2001).

Critical Habitat was initially proposed for UTS in 1980. However, as a result of a lawsuit by the Center for Biological Diversity in January 2002, USFWS was forced to evaluate whether or not to designate Critical Habitat for the UTS and reached a finding that the designation should not be made (67 Federal Register 58580). In 1985, the USFWS prepared a Revised Recovery Plan identifying three Essential Habitat zones within the Santa Clara River watershed (**Figure 2**). They are described in the Revised Recovery Plan (USFWS 1985) as follows:

1. Del Valle Zone. An area of land and water with the following components (San Bernardino meridian): Santa Clara River within T4N, R16W and R17W, beginning at its confluence with San Martinez Grande Canyon, at a point 0.9 of a mile (1.5 kilometers) southwest of Del Valle settlement, and extending upstream approximately 5.6 miles (8.8 kilometers) to the Interstate Highway 5 Bridge.
2. San Francisquito Creek Zone. An area of land and water with the following components (San Bernardino meridian): San Francisquito Canyon watercourse, within T5N, R16W and T6N, R15W, beginning at a point where the Angeles National Forest boundary intersects the San Francisquito Canyon watercourse approximately 2.5 miles southwest of San Francisquito Powerhouse No. 2, and extending upstream in San Francisquito Canyon approximately 8.4 miles (13.5 kilometers) to San Francisquito Powerhouse No. 1, near its junction with Clearwater Canyon.
3. Soledad Canyon Zone. An area of land and water in Los Angeles County, with the following components (San Bernardino meridian): Santa Clara River within T4N, R13W, and R14W, beginning at a point 1.4 miles (2.3 kilometers) upstream in Soledad Canyon from the community of Lang, at the downstream end of the area called River's End Park, at 34° 26' 7" N, 118° 21' 51" W, thence extending upstream approximately 8.5 miles (13.7 kilometers) to its confluence with Arrastre Canyon, at a point located about 0.6 of a mile (1 kilometer) southwest of Los Angeles County

Rehabilitation Camp, thence upstream in Arrastre Canyon approximately 0.8 of a mile (1.4 kilometers) to 34° 26' 7" N, 118° 11' 51" W.

Criteria used by USFWS to select Critical Habitat, and thus Essential Habitat, include evaluation of an area to determine the presence of primary constituent elements. These elements include physical and biological features that are essential to the conservation of the species, and that may require special management and protection (USFWS 1980). Primary constituent elements for UTS include specific quantity and quality of water and isolation from predators. These elements are specifically outlined in the Proposed Rule (USFWS 1980) and include:

- Permanent Stream Flow. Remaining streams utilized by this fish have low discharge rates, so that relatively minor modifications of ground water levels or channel characteristics could result in elimination of all fishes by desiccation.
- Slow Current. Sticklebacks favor shallow water with slow to moderate current, and probably can not reproduce effectively in deep, swift or completely still water.
- Low Turbidity and Pollution. Sticklebacks strongly favor clear water, seldom or never being found in turbid water conditions. Specific pollution susceptibilities have not yet been established, but water quality has been found to be high where populations have persisted, and they have disappeared from streams with reduced water quality.
- Isolation. Survival and genetic integrity evidently depend on the absence of large aquatic predators, certain potential competitors, and all other subspecies of sticklebacks. The latter are not particularly strong swimmers, and apparently do not move upstream during times of high water. They are excluded from the designated areas at other times by natural barriers in certain segments of the watercourse. These barriers should not be modified or bypassed.

It should be noted that, as with most fish species, UTS are not distributed uniformly throughout the drainages they occur in, and that breeding habitats are patchily distributed. The nature of breeding habitats is dynamic and may shift in structure and specific location from year to year depending upon seasonal rainfall and storm cycles. However, most of the breeding habitats identified over the past several years of study have been concentrated in the same general areas and support the same general habitat conditions.

METHODOLOGY

Previous Studies In and Near the Newhall Ranch Project Area

Documentation pertinent to the biological resources in the vicinity of the site was reviewed and analyzed. Information reviewed included: (1) the Revised Recovery Plan for the unarmored threespine stickleback; (2) literature pertaining to habitat requirements of sensitive species potentially occurring

on the project site; (3) the California Natural Diversity Data Base (CNDDB 2003) information regarding special-status species potentially occurring on the project site for the Newhall and Val Verde USGS 7.5-Minute Quadrangle Maps, and (4) previous surveys for aquatic resources in the Newhall Ranch Specific Plan area and vicinity.

The following are sources that provide information regarding special-status fish distribution within and/or in the near vicinity of the study reach. Each of these sources has identified UTS, Santa Ana sucker and arroyo chub as occurring in and near portions of the respective study areas. The general consensus of distribution for UTS in the Santa Clara River includes all areas supporting surface water east (upstream) of the Ventura/Los Angeles County line near San Martinez Grande Canyon.

- U.S. Fish and Wildlife Service. Recovery Plan (revised); Unarmored Threespine Stickleback. Revision approved December 26, 1985 – The first description of the unarmored subspecies was by Girard in 1854 from a specimen collected in Soledad Canyon. Distribution of UTS in the Santa Clara River is described as "...the headwaters of the Santa Clara River and its tributaries, in northern Los Angeles County.
- Aquatic Consulting Services, Inc., July 2002. Aquatic Surveys Along the Santa Clara River: Part IV: Ventura County Line to Las Brisas Bridge, Ventura County, California – Protocol surveys for special status fish species during 2001. Three of 49 sampling locations identified stickleback as being present. All three were within 1.3 miles of the County boundary. None of the sample data indicated the total number of individuals collected and two of the three sample sites indicated sticklebacks were represented as fry or juveniles.
- Aquatic Consulting Services, Inc., June 2002. Aquatic Surveys Along the Santa Clara River: Part III: West of Commerce Center Bridge to the Ventura County Line, California – Protocol surveys for special status fish species during 2001. Seven of the 56 locations sampled included UTS. None of the sample data indicated the total number of individuals collected and some of the sample sites indicated sticklebacks were represented as juveniles.
- Thomas Haglund and Jonathan Baskin, 2000. Fish and Wildlife Survey and Habitat Assessment of the Santa Clara River at Interstate 5 – This project was conducted for the California Department of Transportation for replacement of the Interstate 5 Bridge where it crosses the Santa Clara River. This study included focused special-status fish surveys. Several sites were sampled within 500 meters upstream and downstream of the bridge using a 1/8th inch mesh seine. Arroyo chub, UTS and Santa Ana sucker were detected throughout the survey reach. Large numbers of fry of all three species were detected and suggest breeding by all three species was occurring in that vicinity in 2000. Identification of UTS was made by morphological characteristics, primarily plate counts.
- Thomas Haglund and Jonathan Baskin; December 1995. Final Report: Sensitive Aquatic Species Survey, Santa Clara River and San Francisquito Creek, Newhall Land and Farming Company Property, Los Angeles County, California – Survey results indicated UTS were "continuously distributed from Bouquet Canyon Road Bridge downstream to the confluence of Castaic Creek". Positive subspecific identification was made through horizontal starch gel electrophoresis.
- Thomas Haglund, 1989. Current Status of the Unarmored Threespine Stickleback (*Gasterosteus aculeatus williamsoni*) along portions of the Santa Clara River Drainage – The project reach for this report included the Santa Clara River from near the confluence with Castaic Creek upstream

to near Saugus; Castaic Creek from Interstate 5, downstream to SR 126; and the downstream portion of San Francisquito Creek outside the National Forest. Identification methodology included characterization of lateral plate counts and then identification was further verified utilizing electrophoretic methods. The report concluded that stickleback were absent from lower San Francisquito Creek and were rare in Castaic Creek. Distribution of sticklebacks was patchy along the study reach within the Santa Clara River. The report further determined that the sticklebacks sampled throughout the reach were the unarmored *G. a. williamsoni*.

- Impact Sciences, Inc. 2003. Results of Focused Surveys For Unarmored Threespine Stickleback and Other Special-Status Fish Species: Newhall Ranch, Valencia California – The reach of this project extended from the Las Brisas Bridge crossing in Ventura County, east (upstream) to the confluence with Castaic Creek. Identification of UTS was accomplished by lateral plate counts. Results of the survey indicated scattered, but regular distribution of UTS east of San Martinez Grande crossing. A few individuals appearing to be UTS based solely on lateral plate counts occurred downstream of San Martinez Grande crossing.

Survey Scope and Methods

Though there are no specific survey protocol for sampling UTS, USFWS developed particular criteria to determine sub-specific identification when surveying for sticklebacks. The criteria state “*G. a. williamsoni* are readily distinguished from the other two subspecies on the basis of lateral plate counts alone, provided that at least 25 morphologically mature specimens (i.e., individuals of at least 32mm in standard length [SL], Bell [1981]) are available. Samples of *G. a. williamsoni* generally average 0.06 to 0.55 lateral plates per individual and *G. a. microcephalus* average more than six lateral plates per individual (Bell 1976b).” Plate counts referred to include total number occurring on both sides of the body.

As previously discussed, it is generally accepted by USFWS and UTS experts that sticklebacks occurring east (upstream) of San Martinez Grande Canyon, near the Los Angeles/Ventura County boundary, are the endangered unarmored subspecies. Impact Sciences performed focused surveys for UTS on the subject portion of Castaic Creek on May 13, 14, and 24, 2003. Surveys were conducted by Mr. Dave Crawford under the authority of his individual USFWS Section 10(a)(1)(A) Endangered Species Recovery permit.

In order to minimize impacts to the species, the survey plan included efforts to collect no more than 25 individuals for subspecific identification purposes at any single sampling location. If 25 individual UTS were collected, no further sampling was to be conducted at that site. Any fish collected during the survey effort were released immediately following identification.

Sampling was conducted utilizing a 10x5-foot 1/8-inch woven mesh seine and a small hand net. Sampling locations were selected based on the presence of typically suitable habitat. However,

additional survey sites were also sampled such that representative locations of all habitat types present in the survey reach were included. A combined total of 11 sites were sampled within the survey reach. At each sample site, the stream was sampled for fish and general habitat characteristics were recorded. Any fish present were identified, as were any other special-status aquatic wildlife species observed.

The portion of Castaic Creek included in the survey is typically not a perennial source of water. Water occurring in this portion of the drainage is generally a direct result of water being released from Castaic Dam during storm events, or when other factors require lowering the water level in Castaic Lake. The discharge is relatively inconsistent and often times results in Castaic Creek, as it occurs below the lagoon, to be either completely dry or supporting only a few scattered remnant pools. As such, these conditions are not expected to be conducive to regular breeding by UTS or other special-status fish species. Depending upon the duration of flows in the creek, combined with other factors including volume and velocity of flows, there is a small potential for UTS and other special-status fish species to migrate upstream in Castaic Creek from the Santa Clara River. Based on the flow volumes and characteristics at the time of the survey, and natural barriers such as small cascades along the creek channel, it is considered unlikely that any of the small special-status fish species occurring in the Santa Clara River would be able to navigate the stream channel upstream as far as the survey site.

SURVEY RESULTS

No UTS or other special-status fish species were observed during the sampling effort. At the time of the survey, water was being released, and had been released from Castaic Lagoon for several weeks, which resulted in a relatively high volume of water that created both large ponded areas in the northern portion of the survey area, and fast-flowing narrow channels in the southern portions.

The ponded areas below the lagoon had silty, muddy bottoms, but relatively clear water. It appeared that most of these areas were newly submerged as there were several emergent shrubs, typically associated with upland habitats. No fish of any kind were observed in any of the ponded areas. The only aquatic vertebrates observed in any of these areas were tadpoles of native western toad (*Bufo boreas*) and the introduced and highly predatory African clawed frog (*Xenopus laevis*).

Within the flowing channels of the remaining portions of the survey reach, the only fish species observed was prickly sculpin (*Cottus asper*). Though this species is native to California, the prickly sculpin is considered introduced to this watershed. The only other vertebrate species observed in these remaining areas of the survey reach were western toad and African clawed frog tadpoles.

CONCLUSION/DISCUSSION

Nearly all of the Santa Clara River, east (upstream) of the San Martinez Grande Canyon is considered by regulatory agencies and fisheries biologists to be of relatively high quality for UTS as this species has been identified throughout this reach and because most or all of the primary constituent elements for UTS habitat are present. However, all tributary streams to the river, including Castaic Creek, do not support the same conditions. Specifically, flows in Castaic Creek below the Castaic Dam are limited to large storm events and subsequent releases from the Dam. As such, one of the key primary constituent elements, permanent flows, is absent from this drainage. Additionally, because of the volumes and rates of flow that occur during releases and storm events, coupled with the natural barriers to upstream navigation, small fish such as the special-status species known from the Santa Clara River are not expected to be able to migrate upstream to, or otherwise occur in, the survey area.

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