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**Results of Focused Surveys for
Unarmored Threespine Stickleback
and Other Special-Status Fish Species
Newhall Ranch,
Valencia, California**

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TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
INTRODUCTION.....	1
General UTS Background.....	5
Overview of UTS Habitat Characteristics.....	7
Essential Habitat Designation.....	7
General Santa Ana Sucker Background.....	10
General Arroyo Chub Background.....	11
METHODOLOGY.....	11
Previous Studies In and Near the Newhall Ranch Project Area.....	11
Survey Scope and Methods.....	13
SURVEY RESULTS.....	16
Reach 1.....	16
Reach 2.....	17
Habitat Evaluation Summary.....	18
CONCLUSION/DISCUSSION.....	18
REFERENCES.....	20

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1 Survey Area Location.....	2
2 Survey Reach 1.....	3
3 Survey Reach 2.....	4
4 Sub Species Illustrations.....	6
5 Essential Habitat Locations.....	8
6 Survey Reach 1 Sample Locations.....	14
7 Survey Reach 2 Sample Locations.....	15

LIST OF APPENDICES

Appendix A – Summary of Survey Data

**Results of Focused Surveys for Unarmored Threespine Stickleback
and Special-Status Fish Species
Newhall Ranch
Valencia, California**

The following presents the findings of focused protocol surveys that were conducted between March and June, 2002 to determine the presence/absence of the federally- and state-listed Endangered unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*) (herein UTS) in portions of the Santa Clara River in Los Angeles County that are incorporated within and downstream of the Newhall Ranch Specific Plan area. This report is intended to provide project specific biological information to Newhall Ranch Company, U.S. Army Corps of Engineers (ACOE), U.S. Fish and Wildlife Service (USFWS), and California Department of Fish and Game (DFG) regarding results of focused surveys for 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 areas are situated within the Val Verde and Newhall, California U.S. Geological Survey (USGS) 7.5-minute quadrangle maps, in portions of Ventura and Los Angeles Counties (Figure 1). The subject survey area is divided into two reaches; Reach 1 is located in northwest Los Angeles County, incorporating the portions of river included within the Newhall Ranch Specific Plan area, and Reach 2 includes additional portions of the Santa Clara River owned by Newhall Land and Farming, located in northeast Ventura County (Figures 2 and 3, respectively). All sample sites selected were within potentially suitable habitats in portions of the Santa Clara River from near its confluence with Castaic Creek, west (downstream) approximately seven (7) miles. The primary purpose of these surveys was to determine current distribution of the UTS and to differentiate specific habitat characteristics being utilized by UTS within the portions of the Santa Clara River included in the Newhall Ranch Specific Plan area, as well as downstream on land owned by The Newhall Land and Farming Company. The secondary purpose was to determine the presence and current distribution of other special-status fish species including the Santa Ana sucker and the Arroyo chub.

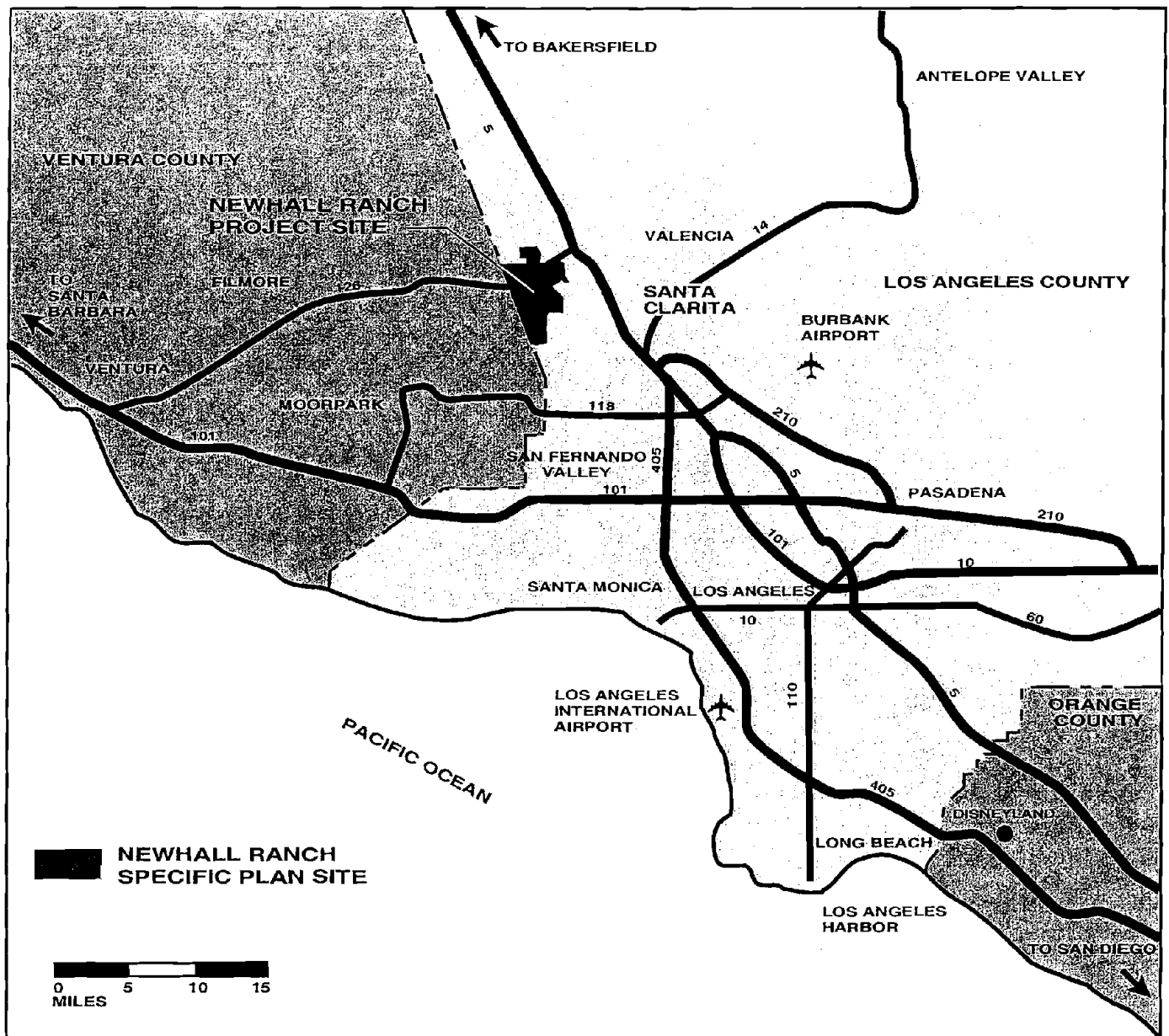


Figure 1
REGIONAL LOCATION MAP

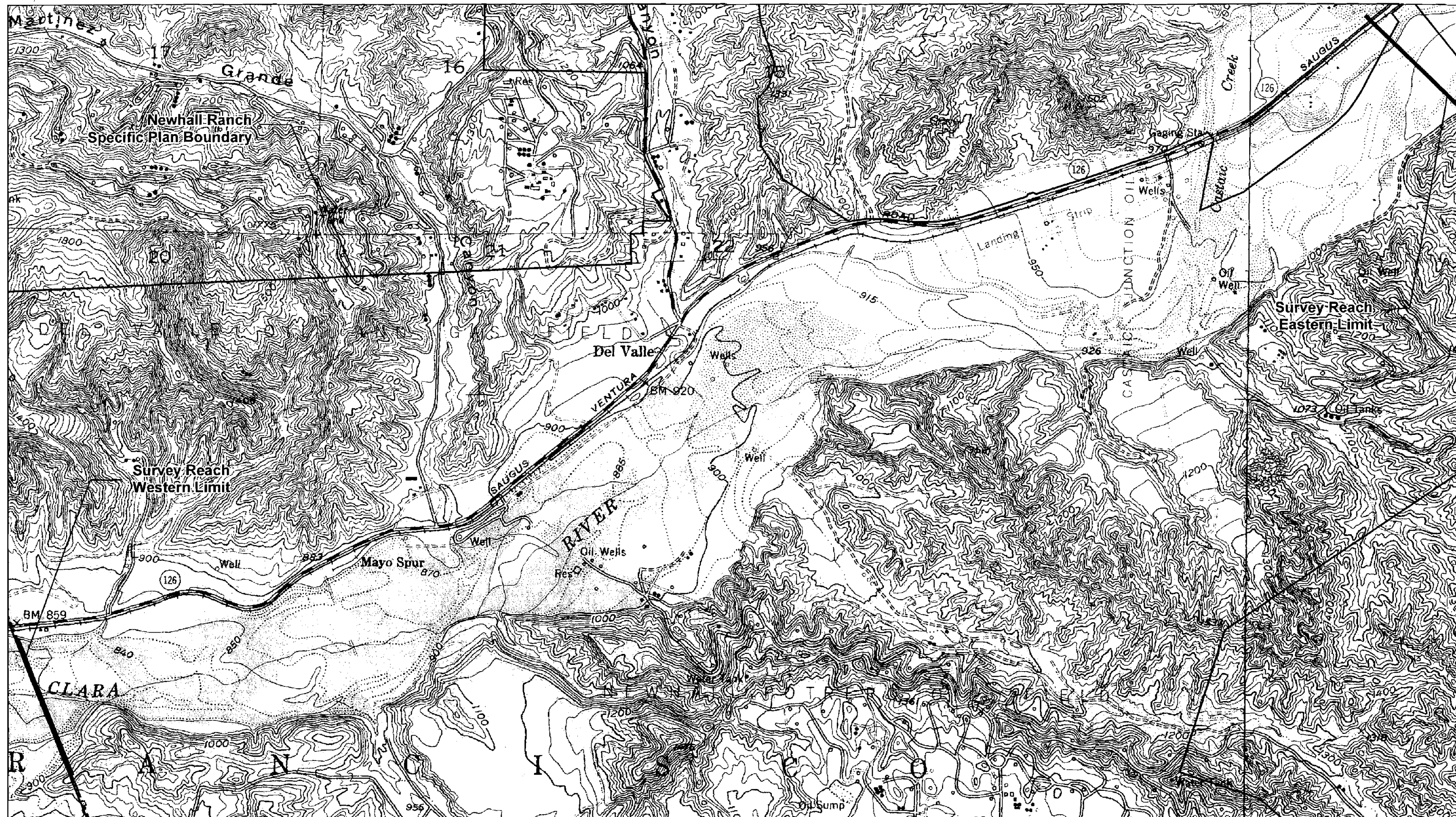


Figure 2

SURVEY REACH 1

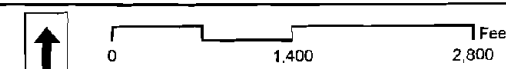
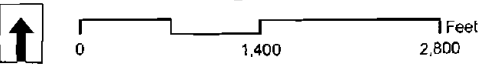




Figure 3

SURVEY REACH 2



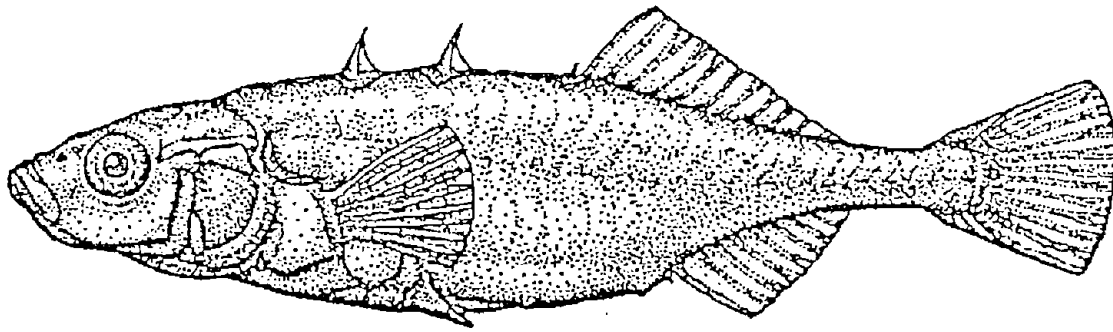
General UTS Background

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.

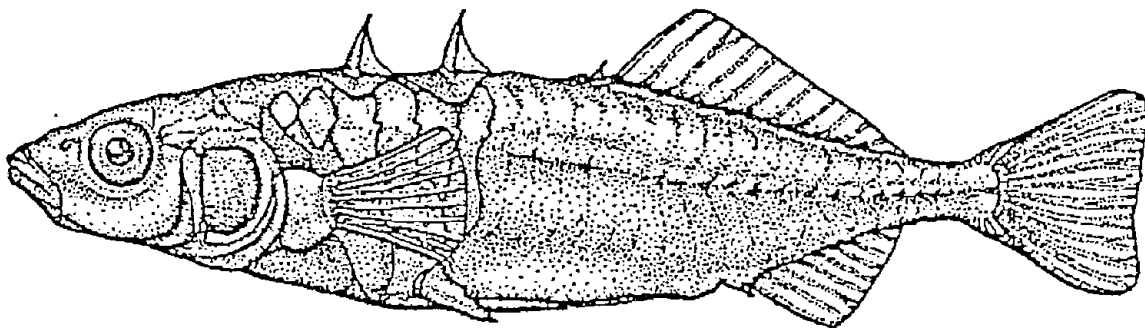
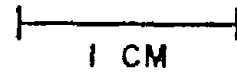
Three morphologically distinct subspecies of threespine stickleback (*Gasterosteus aculeatus*) occur in California. Two of these, the semi-armored (*G. a. microcephalus*) and the subject unarmed subspecies (*G. a. williamsoni*) occur in the Santa Clara River system. The number of, or absence of bony 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 and are limited to the anterior portion of the body. Figure 4 provides an illustration of the three subspecific morphological characteristics.

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, 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).

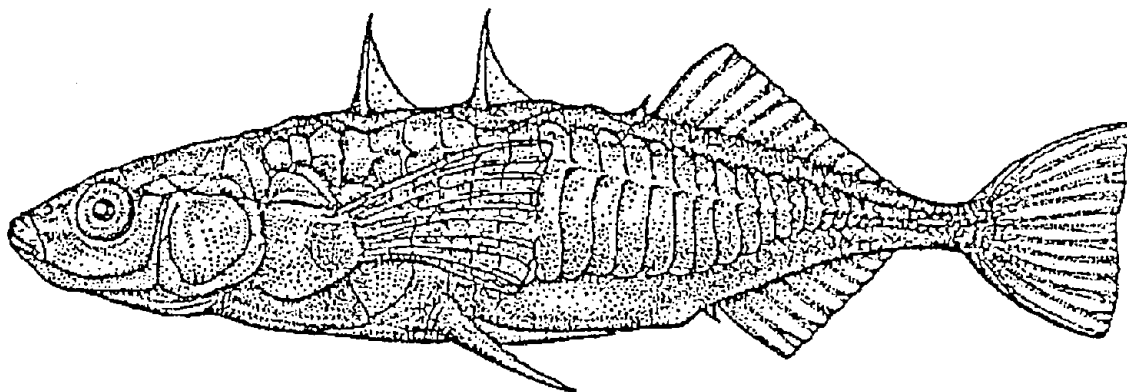
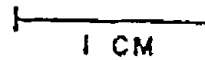
The UTS was listed as an Endangered species by the USFWS in October 1970 (35 Federal Register 16047) and by the State of California in June 1971. A federal Recovery Plan was initially prepared by USFWS in 1977 and a Revised Recovery Plan was prepared in December 1985. Critical habitat was proposed in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



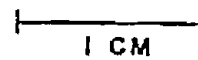
G. a. williamsoni



G. a. microcephalus



G. a. aculeatus



Source Haglund, 1989



NEWHALL RANCH™
SPECIFIC PLAN

Prepared For: Newhall Ranch Company

Figure 4
**SUBSPECIFIC MORPHOLOGICAL
CHARACTERISTICS**

JANUARY 2003

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).

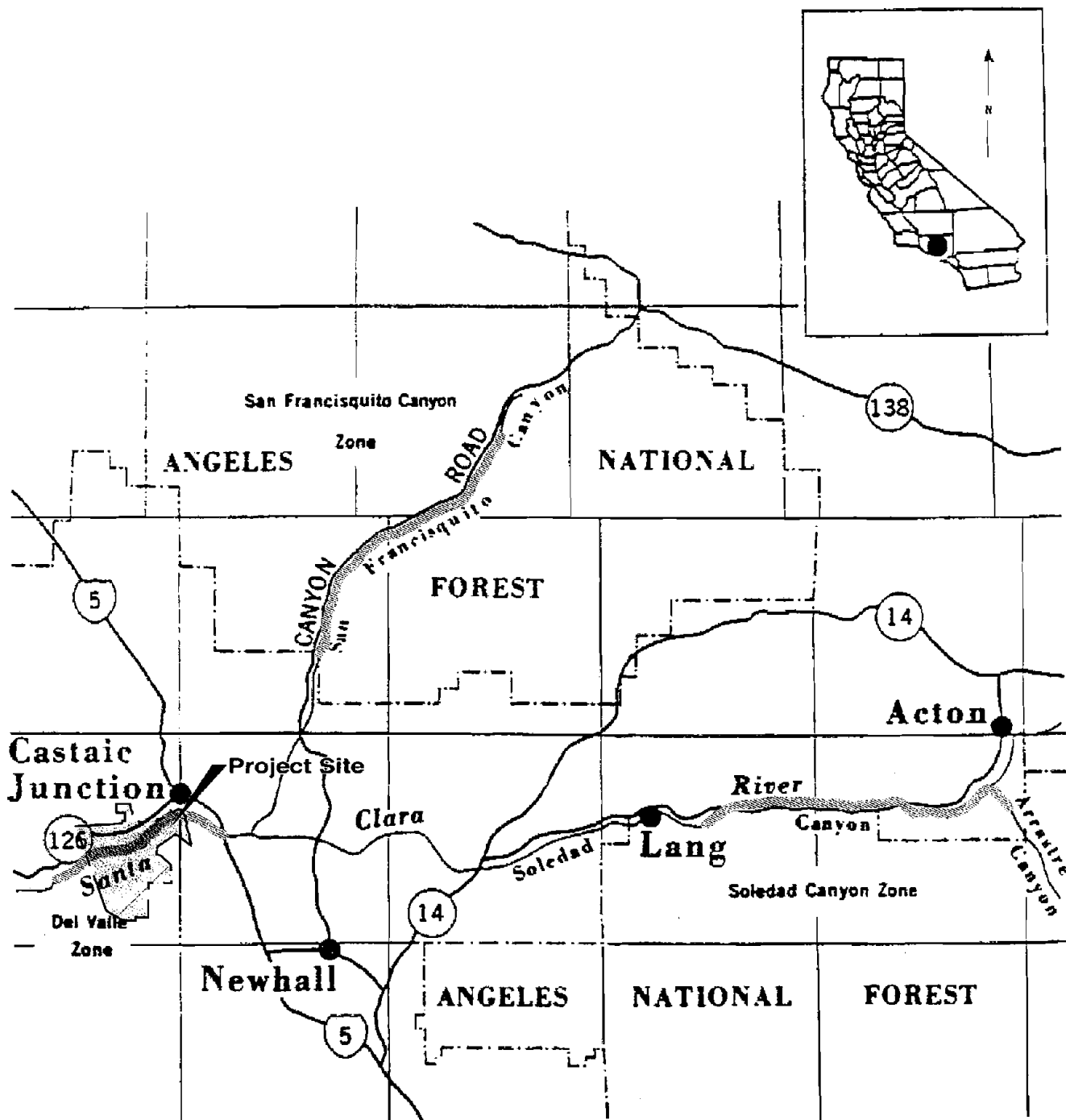
Adults have been found in a variety of habitats throughout the stream, but tend to occur most frequently in areas of slow or standing water. When occurring in the main stream channel, they tend to seek shelter behind obstructions and under vegetation (USFWS 1985).

Essential Habitat Designation

Essential 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 5). 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.



ESSENTIAL HABITAT

Source UTS Recovery Plan, 1985



Prepared For: Newhall Ranch Company

Figure 5
ESSENTIAL HABITAT ZONES

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 Santa Clara River, 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.

It is expected that the perennial source of tertiary treated effluent discharged from Water Reclamation Plants (WRP) 32 and 26 contribute to provide more persistent breeding and nursery habitats than occurred naturally. The discharge is relatively consistent in temperature and average velocity. Larger storm events are still expected to significantly alter breeding and nursery areas in the short term, but the regular release of water from the WRPs likely allows for extended breeding throughout the otherwise dry summer months.

General Santa Ana Sucker Background

Santa Ana suckers are endemic to drainages of the Los Angeles Basin including the Los Angeles, San Gabriel, and Santa Ana Rivers. This is the smallest sucker species in California, rarely reaching lengths greater than six inches (McGinnis 1984). They primarily feed on algae, detritus, and diatoms and have indicated intolerance for polluted or highly modified streams. Spawning generally occurs from April through early July and peaks in late May to early June. From 4,400 to over 16,000 eggs may be laid by a single female over gravel substrate. Santa Ana suckers are relatively short-lived, rarely surviving beyond their second year (Haglund and Baskin, 1995). Like the UTS, Santa Ana suckers have evolved in drainages that often dry to small scattered pools in the dry summers; tolerant of warm water and low oxygen levels.

This species occurs in a variety of habitats within small to medium-sized (less than 22 feet wide) perennial stream channels with gravelly to rocky substrates. They are found in depths ranging from a few inches to over three feet and occur in variable flows from slow to swift (Moyle et al. 1995). They are typically found in clear water, but can tolerate periods of increased turbidity.

The Santa Ana sucker was listed by the USFWS as a threatened species on May 12, 2000. However, as this species is considered to be introduced in the Santa Clara River watershed, the population here is specifically excluded from the federal threatened status. Santa Ana suckers are considered by CDFG to be Species of Special Concern. CDFG does not differentiate Santa Ana Suckers occurring in the Santa Clara River from other populations. This species was considered to be abundant as recently as 1970, but has since significantly declined in most of its native drainages (Moyle et al. 1995).

General Arroyo Chub Background

According to Moyle et al. (1995) arroyo chubs are native to the Los Angeles, San Gabriel, San Luis Rey, Santa Ana, and Santa Margarita rivers, as well as, Malibu and San Juan Creeks. They have also been introduced into a number of drainages, extending their current range north to Chorro Creek in San Luis Obispo County. The population in the Santa Clara River, including the study reach, is also considered an introduced population.

The arroyo chub is relatively small, with adults averaging five inches in length. They are known to spawn primarily during March and April, though some may breed into July (Haglund and Baskin, 1995). Spawning typically occurs in slow pools with aquatic vegetation. Some arroyo chubs have been determined to be over 4 years old, but breeding begins after the first year. After the second year, females are generally larger than males (Haglund and Baskin, 1995). An omnivorous species, the arroyo chub feeds on algae, insects, and small crustaceans. They are believed to obtain much of their nutrition from the organisms associated with the aquatic plants (Haglund and Baskin, 1995). Like the other two fish species discussed, the arroyo chub has evolved to tolerate high temperatures and hypoxic conditions that occur in the dry summers.

Habitat requirements are described by Moyle (1995) as slow-moving or backwater sections of warm to cool streams with mud or sand substrates. Within the survey reach, chubs were the most abundant species present and were detected in a variety of microhabitat conditions and flows, including open swift flowing portions of the channel.

The arroyo chub is not listed by either federal or state regulatory agencies, but is considered a Species of Special Concern by CDFG due to its declining status in its native drainages. The special concern status does not distinguish between native and introduced populations.

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 2002) 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*.

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 32 mm 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 are the endangered unarmored subspecies. Impact Sciences performed focused surveys for UTS between March 27 and June 15, 2002. Surveys were conducted by Mr. Dave Crawford under the authority of his individual USFWS Section 10(a)(1)(A) Endangered Species Recovery permits.

The purpose of the survey effort was to determine presence/absence, and if present the current distribution of UTS and other special-status fish species within the Newhall Ranch Specific Plan area. In order to minimize impacts to the species, whenever UTS were detected, an effort was made to collect no more than 25 individuals for subspecific identification purposes. If 25 individual UTS were collected, no further sampling was to be conducted at that survey location. All fish collected during the survey effort were released immediately following identification. No UTS or other special-status fish species were lost during the survey effort.

Sampling was conducted utilizing a 15x5-foot 1/8th-inch mesh seine and a small hand net. Most locations observed within the survey reach that supported typically suitable habitat were sampled. 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 56 survey locations were sampled in the two survey areas covered in this study (Figures 6 and 7). At each sample site, the location was recorded utilizing a GPS unit (with sub-meter accuracy), the stream was sampled for fish and general habitat characteristics were recorded. All fish were identified, as were any other special-status aquatic wildlife species observed. In addition to fish sampling, the survey effort included an analysis of habitat types being utilized by UTS.

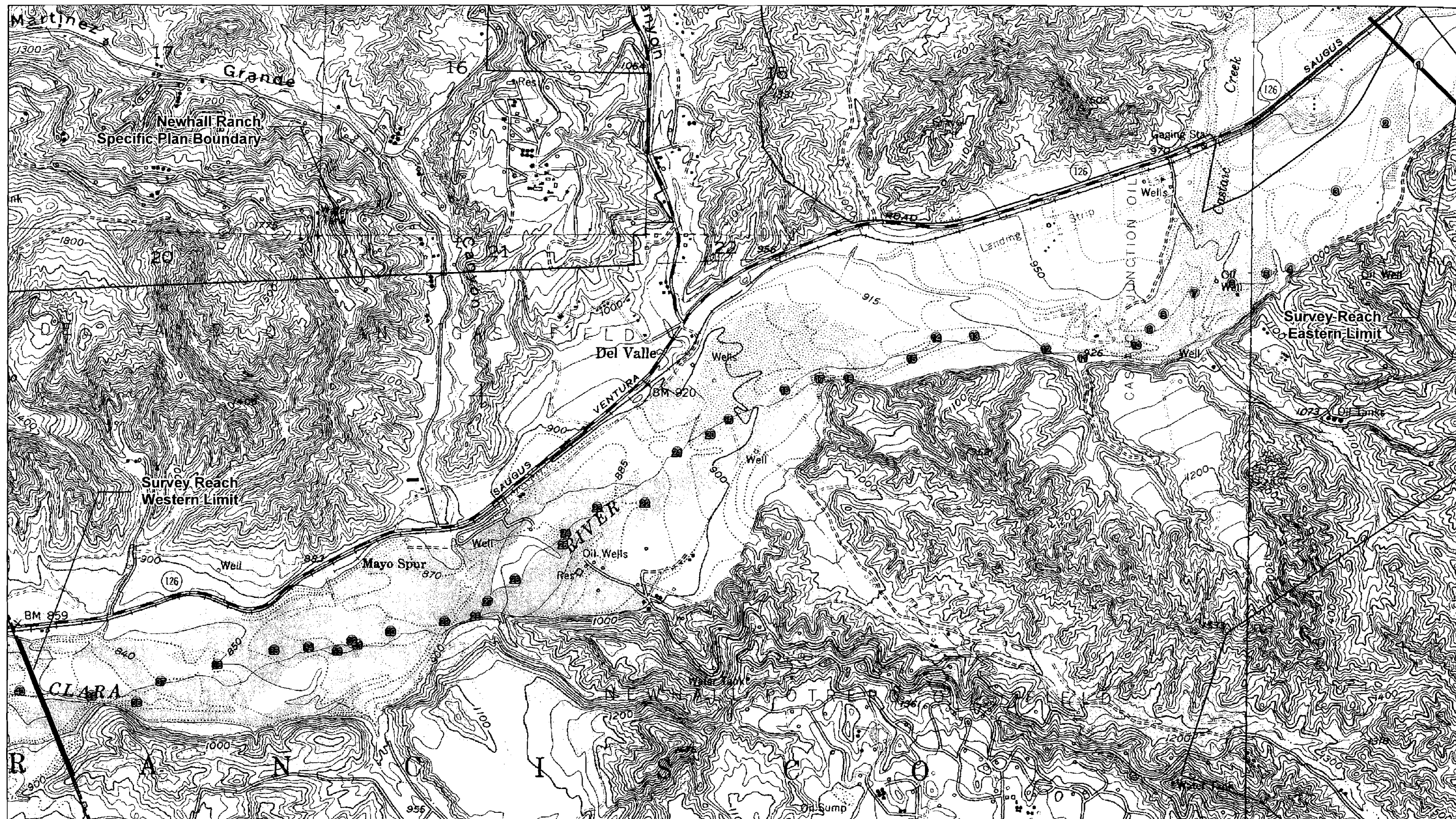
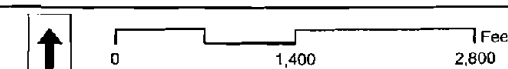


Figure 6

REACH 1 SAMPLE LOCATIONS



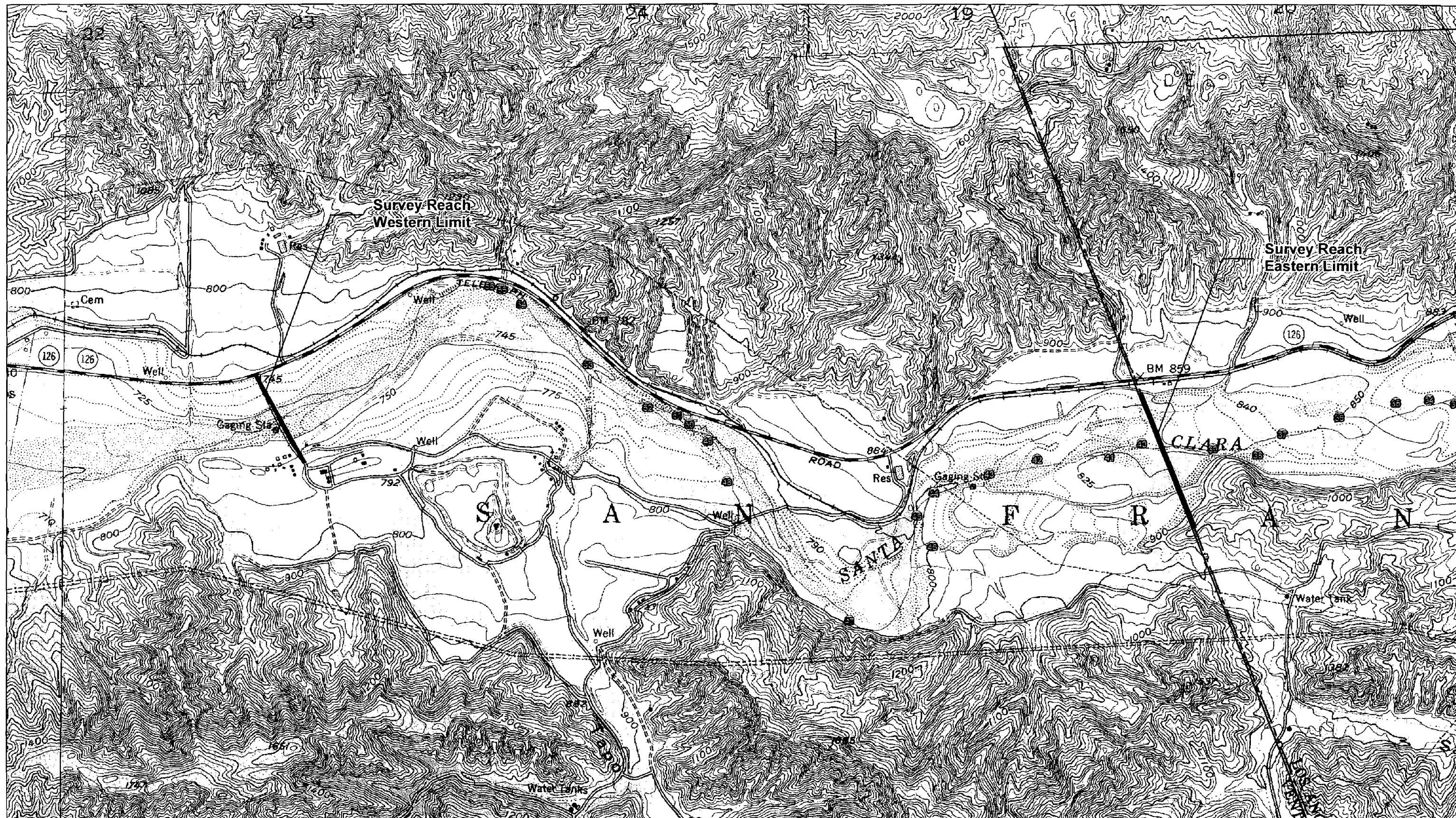
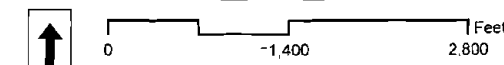


Figure 7

REACH 2 SAMPLE LOCATIONS



SURVEY RESULTS

During some of the survey efforts, there was a higher than average volume of water flowing at a relatively high velocity compared to typical summer season flows. The focus species of this survey, particularly sticklebacks, tend to avoid areas of high velocity flows. Additionally, areas of high flow rates combined with a high volume of water affects the efficiency of the seining efforts with small mesh nets as the weighted line is often lifted from the bottom of the stream, permitting escape of trapped fish. As such, the higher flow rates may have some affect on the data, and therefore, on the perceived distribution of special-status fish species occurring in the survey area. It should also be noted that four additional survey sites were sampled between site 56 and the Las Brisas Bridge to the west (refer to **Figure 7**). At the time of the surveys, it was not possible record a fixed GPS location, as such, the additional sample sites are not illustrated. The only fish species identified at these 4 additional locations were arroyo chub.

Reach 1

Unarmored threespine stickleback, Arroyo chub and Santa Ana Sucker were recorded in multiple locations within this survey reach. There were no concentrations of UTS or Santa Ana sucker fry or gravid females identified that would indicate important breeding areas. However, individuals representing juvenile and mature stages of growth were recorded within the reach; suggesting that some breeding occurs either within or in the near vicinity of this reach. Arroyo chubs of all age classes were identified during the survey suggesting they likely breed throughout the survey reach.

Out of the total 39 sample locations within Reach 1, 27 UTS were identified at 8 locations. Adults and subadults were recorded. All sticklebacks captured and recorded had one or less lateral plates. Although none of the locations yielded 25 or more individuals, the plate counts and electrophoresis data recorded from these areas suggest these were all of the endangered unarmored subspecies *G. williamsoni*.

Santa Ana suckers were identified at nine (9) separate locations. Sizes of suckers ranged from adult to subadult, but no young-of-the-year were observed. Most of the locations where this species was recorded included between five and 12 individuals. This is not unusual as Santa Ana suckers are typically a schooling species.

Arroyo chub were abundant throughout the reach, and were observed at all but five of the sample locations. All age classes were recorded suggesting that spawning likely occurs throughout both of the survey reaches.

Additional fish species recorded in Reach 1 include prickly sculpin (*Cottus asper*), mosquitofish (*Gambusia affinis*), and largemouth bass (*Micropterus salmoides*). None of these species are considered native to the Santa Clara River watershed. Largemouth bass is a predatory fish that may significantly affect native fish populations where it occurs.

Reach 2

Each of the target special-status fish species were recorded within Reach 2. There were no concentrations of fry or gravid females of either of these species detected that would indicate important breeding areas. However, individuals representing juvenile and mature stages of Santa Ana sucker were recorded within the reach; suggesting that some breeding occurs either within or in the near vicinity of this reach. Arroyo chubs of all age classes were identified during the survey suggesting they likely breed throughout the survey reach.

Out of the total 17 sample locations within Reach 1 (Sites 40-56), only one individual UTS was identified at 1 location. This single adult male did not have any visible lateral plates. Although 25 or more individuals were not present to definitively conclude subspecific identification, the plate count suggests this individual was the endangered unarmored subspecies *G. williamsoni*. Although sticklebacks occurring in the Santa Clara River west of the Los Angeles/Ventura County boundary are not typically considered the unarmored subspecies, it is reasonable to conclude that individual UTS are occasionally swept downstream.

Santa Ana suckers were identified at two separate locations. Sizes of suckers ranged from adult to subadult, but no young-of-the-year were observed.

Arroyo chub were abundant throughout the reach, recorded at all 17 of the sample locations. All age classes were recorded suggesting that spawning likely occurs throughout both of the survey reaches.

Additional fish species recorded in Reach 2 include prickly sculpin, mosquitofish, and largemouth bass. None of these species are considered native to the Santa Clara River watershed.

Two southwestern pond turtles (*Clemmys marmorata pallida*), a California Species of Special Concern, were identified at Station 52 in a ponded area. The non-native predatory African clawed frog (*Xenopus laevis*) was also observed in this reach at Station 43. Clawed frogs are highly predatory and may negatively affect populations of native fishes where it occurs.

Appendix A provides a summary of data collected for each sample site including the recorded GPS coordinates, a brief description of the habitat(s), the species of fish collected, and any other pertinent and incidental recorded observances.

Habitat Evaluation Summary

Most of the Santa Clara River within the Newhall Ranch Specific Plan area, east (upstream) of the Ventura/Los Angeles County boundary 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. Results of the surveys reported herein confirm the presence of UTS in scattered locations throughout Reach 1 and generally support previous data.

Though similarly suitable habitat occurs west of the Los Angeles/Ventura County boundary, there are a few natural and man-made structural elements that impede upstream and downstream movement, and often, in dry summer months, the water flows just west of the boundary often shift to below the surface.

As discussed the habitat evaluation was conducted concurrently with the presence/absence surveys within the two survey reaches with the goal of identifying specific important breeding and nursery areas, and any other habitats where UTS appeared to occur in concentrated numbers. The data suggest there were no areas within the Newhall Ranch Specific Plan survey reach or the additional Newhall Ranch properties in Ventura County that were identified as particularly important breeding areas. It is not suggested that breeding or rearing cannot occur in these areas, but that there were no specific areas indicated by the data where this occurs to a significant degree.

CONCLUSION/DISCUSSION

Special status fish species including UTS, Santa Ana sucker, and arroyo chub were identified within both survey reaches. The presence of a single UTS in Reach 2 may be either accidental, indicative that suitable habitat is not present to support greater numbers or both. The numbers and locations of UTS recorded during this survey suggest the assumed 'boundary' of distribution at the Los Angeles/Ventura

County line is relatively accurate. The data also indicate that there are currently no particular areas of concentrated breeding or grow-out of special-status fish species in either survey reach. However, the presence of several UTS, Santa Ana suckers and arroyo chubs indicate that habitats and conditions within the surveyed areas continue to be of suitable quality to support reproducing populations of each of these special-status species.

Although the populations of Santa Ana sucker and arroyo chub in the Santa Clara River watershed are considered to be introduced, their presence and persistence here is important as many of the drainages to which they are native, continue to be impacted by urbanization. As such, the Santa Clara River populations may one day serve as an important genetic base for the continued survival of these species if remaining native populations continue to decline elsewhere.

The presence of Santa Ana sucker and arroyo chub does not appear to negatively affect the persistence of UTS where they occur together. Because all three have similar habitat requirements, the management and protection of UTS will likely benefit Santa Ana sucker and arroyo chub.

Management and protection of UTS should continue and include measures to preserve and protect all of the primary constituent elements. Permanent stream flow is facilitated in the subject survey area by releases of tertiary treated water from the WRP No. 32 near Castaic Junction and WRP No. 26 further upstream (adjacent to Bouquet Canyon Road Bridge). Past and recent survey data suggest that this perennial effect may facilitate more frequent breeding and a greater amount of dispersal habitat for young downstream of these releases. As the releases are intermittent, areas of slow current are maintained, turbidity is minimized and the treatment process of the water limits pollution. Additional measures to limit the influx of pollutants into the river should continue to be part of the design environmental review process for future development projects along the river. Further, it will be important to ensure existing natural barriers of genetic transfer are maintained such that the semi-armored subspecies of stickleback is not permitted to breed with the unarmored population.

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APPENDIX A
Fish Survey Data

Appendix A

Newhall Ranch Specific Plan Area Fish Survey Data

REACH 1

Station # 1	GPS location: 34° 25' 54"N 118° 36' 57"W
Habitat Description:	Stream width ± 25', Depth ±24", Sandy cobble substrate Outer dense willows; Stream edge dense cattails <10% submergent filamentous algae
Species Recorded:	arroyo chub
Station # 2	GPS location: 34° 25' 44"N 118° 37' 04"W
Habitat Description:	Stream width ± 14', Depth ±20", Sandy cobble substrate Outer arundo and willow; Stream edge dense cattail <10% submergent filamentous algae
Species Recorded:	arroyo chub
Station # 3	GPS location: 34° 25' 33"N 118° 37' 12"W
Habitat Description:	Stream width ± 8', Depth ±30", Gravelly rock substrate Outer willow and cottonwood; Stream edge dense cattail No submergent algae
Species Recorded:	arroyo chub
Station # 4	GPS location: 34° 25' 22"N 118° 37' 22"W
Habitat Description:	Stream width ± 35', Depth ±20", Sandy cobble substrate Outer willow/cottonwood/arundo; Stream edge grass No submergent algae
Species Recorded:	None
Station # 5	GPS location: 34° 25' 19"N 118° 37' 26"W
Habitat Description:	Stream width ± 20', Depth ±20", Sandy gravel substrate Outer dense willow/arundo; Stream edge grass <10% submergent filamentous algae
Species Recorded:	arroyo chub, Santa Ana sucker
Station # 6	GPS location: 34° 25' 19"N 118° 37' 33"W
Habitat Description:	Stream width ± 15', Depth ±18", Sandy gravel substrate Outer dense arundo/willow; Stream edge grass/speedwell <10% submergent filamentous algae
Species Recorded:	arroyo chub, UTS (7 subadults, 3 adults), mosquitofish
Station # 7	GPS location: 34° 25' 19"N 118° 37' 40"W
Habitat Description:	Stream width ± 20', Depth ±24", Sandy gravel substrate Outer dense willows; Stream edge watercress 10-25% submergent filamentous algae
Species Recorded:	arroyo chub, UTS (1 subadult, 1 adult), Santa Ana sucker

Appendix A (continued)
Newhall Ranch Specific Plan Area
Fish Survey Data

REACH 1 (continued)

Station # 8	GPS location: 34° 25' 15"N 118° 37' 47"W
Habitat Description:	Stream width ± 18', Depth ±24", Sandy gravel substrate Outer dense willow/arundo; Stream edge speedwell/grass <10% submergent filamentous algae
Species Recorded:	arroyo chub
Station # 9	GPS location: 34° 25' 12"N 118° 37' 47"W
Habitat Description:	Stream width ± 20', Depth ±28", Sandy cobble substrate Outer dense arundo/willow; Stream edge grass/speedwell No submergent algae
Species Recorded:	arroyo chub
Station # 10	GPS location: 34° 25' 08"N 118° 37' 51"W
Habitat Description:	Stream width ± 15', Depth ±30", Gravelly cobble substrate Outer dense arundo; Stream edge speedwell, grass, small willow No submergent algae
Species Recorded:	arroyo chub, Santa Ana sucker
Station # 11	GPS location: 34° 25' 08"N 118° 38' 02"W
Habitat Description:	(crossing) Stream width ± 35', Depth ±18", Silty sand substrate Willow/cottonwood/dense cattail 25-50% submergent filamentous algae
Species Recorded:	arroyo chub, mosquitofish, largemouth bass
Station # 12	GPS location: 34° 25' 08"N 118° 38' 09"W
Habitat Description:	Stream width ± 25', Depth ±18", Sandy substrate Outer willows; Stream edge grass/cattail 10-25% submergent filamentous algae
Species Recorded:	mosquitofish
Station # 13	GPS location: 34° 25' 12"N 118° 38' 24"W
Habitat Description:	Stream width ± 15', Depth ±12", Sandy cobble substrate Outer willow/mule fat; Stream edge cocklebur/grass No submergent algae
Species Recorded:	arroyo chub, Santa Ana sucker, prickly sculpin
Station # 14	GPS location: 34° 25' 08"N 118° 38' 31"W
Habitat Description:	Stream width ± 15', Depth ±30", Sandy gravel substrate Outer willow/cottonwood; Stream edge dense cattail 10-25% submergent filamentous algae
Species Recorded:	arroyo chub, UTS (4 subadults, 4 adults)

Appendix A (continued)
Newhall Ranch Specific Plan Area
Fish Survey Data

REACH 1 (continued)

Station # 15	GPS location: 34° 25' 04"N 118° 38' 34"W
Habitat Description:	Stream width ± 10', Depth ±24", Sandy cobble substrate Outer willows; Stream edge grass, rush, watercress, duckweed <10% submergent filamentous algae
Species Recorded:	arroyo chub, mosquitofish
Station # 16	GPS location: 34° 25' 04"N 118° 38' 49"W
Habitat Description:	Stream width ± 8', Depth ±24", Gravelly cobble substrate Outer clump of willow; Stream edge grass, speedwell, sedge No submergent algae
Species Recorded:	arroyo chub
Station # 17	GPS location: 34° 25' 04"N 118° 38' 52"W
Habitat Description:	Stream width ± 20', Depth ±28" (ponded), Silty sand substrate Open sandbars, mule fat; Stream edge speedwell, cattail, watercress, duckweed 25-50% submergent filamentous algae
Species Recorded:	arroyo chub, UTS (1 adult), Santa Ana sucker, mosquitofish
Station # 18	GPS location: 34° 25' 01"N 118° 39' 00"W
Habitat Description:	Stream width ± 14', Depth ±14", Cobble substrate Outer dense mule fat; Stream edge grass/scattered cattail No submergent algae
Species Recorded:	arroyo chub, mosquitofish
Station # 19	GPS location: 34° 24' 57"N 118° 39' 10"W
Habitat Description:	Stream width ± 12', Depth ±24", Sandy cobble substrate Open terrace on north; steep gravel berm on south; Stream edge grass 10-25% submergent filamentous algae
Species Recorded:	arroyo chub, UTS (1 adult), African clawed frog
Station # 20	GPS location: 34° 24' 53"N 118° 39' 14"W
Habitat Description:	Stream width ± 16', Depth ±12", Sandy gravel substrate South bank dense willow/tamarisk; North bank open mule fat terrace; Stream edge grass/cattails <10% submergent algae
Species Recorded:	arroyo chub

Appendix A (continued)
Newhall Ranch Specific Plan Area
Fish Survey Data

REACH 1 (continued)

Station # 21	GPS location: 34° 24' 50"N 118° 39' 21"W
Habitat Description:	Stream width ± 4' (secondary channel), Depth ±4", Gravel substrate Open terraces w/ scattered mule fat; Stream edge watercress, speedwell 10-25% submergent filamentous algae
Species Recorded:	mosquitofish
Station # 22	GPS location: 34° 24' 43"N 118° 39' 28"W
Habitat Description:	Stream width ± 25', Depth ±12", Gravel substrate South bank dense willow/mule fat, North bank open scattered mule fat; Stream edge grass No submergent algae
Species Recorded:	arroyo chub, Santa Ana sucker, UTS (2 adults)
Station # 23	GPS location: 34° 24' 43"N 118° 39' 35"W
Habitat Description:	Stream width ± 4' (secondary channel), Depth ±6", Sandy gravel substrate Open terraces; Stream edge grass/speedwell <10% submergent filamentous algae
Species Recorded:	None
Station # 24	GPS location: 34° 24' 35"N 118° 39' 43"W
Habitat Description:	Stream width ± 18', Depth ±12", Sandy gravel substrate North bank willow/cottonwood; South bank mule fat terrace; Stream edge speedwell No submergent algae
Species Recorded:	arroyo chub
Station # 25	GPS location: 34° 24' 35"N 118° 39' 44"W
Habitat Description:	Stream width ± 3' (secondary channel), Depth ±8", Sandy cobble substrate Open terraces; Stream edge grass/speedwell/watercress <10% submergent filamentous algae
Species Recorded:	arroyo chub
Station # 26	GPS location: 34° 24' 28"N 118° 39' 54"W
Habitat Description:	Stream width ± 10', Depth ±20", Sandy cobble substrate Open scattered mule fat terraces; Stream edge grass/speedwell No submergent algae
Species Recorded:	mosquitofish

Appendix A (continued)
Newhall Ranch Specific Plan Area
Fish Survey Data

REACH 1 (continued)

Station # 27	GPS location: 34° 24' 25"N 118° 39' 57"W
Habitat Description:	Stream width ± 16', Depth ±18", Silty sand substrate North bank dense willows; South bank open scattered mule fat; Stream edge cattail/rush/speedwell/watercress <10% submergent filamentous algae
Species Recorded:	arroyo chub
Station # 28	GPS location: 34° 24' 25"N 118° 40' 01"W
Habitat Description:	Stream width ± 6' (secondary channel), Depth ±24", Sandy cobble substrate Open terraces; scattered mule fat; Stream edge grass No submergent algae
Species Recorded:	arroyo chub
Station # 29	GPS location: 34° 24' 25"N 118° 40' 08"W
Habitat Description:	Stream width ± 12', Depth ±12", Sandy cobble substrate (pipe crossing) open terraces w/ scattered mule fat; Stream edge grass/speedwell No submergent algae
Species Recorded:	arroyo chub
Station # 30	GPS location: 34° 24' 21"N 118° 40' 15"W
Habitat Description:	Stream width ± 10', Depth ±12", Sandy cobble substrate Open terraces w/ scattered mule fat; Stream edge grass <10% submergent filamentous algae
Species Recorded:	arroyo chub, Santa Ana sucker
Station # 31	GPS location: 34° 24' 21"N 118° 40' 16"W
Habitat Description:	Stream width ± 4' (secondary channel), Depth ±6", Sandy substrate Open terraces w/ scattered mule fat/tamarisk; Stream edge grass <10% submergent filamentous algae
Species Recorded:	arroyo chub
Station # 32	GPS location: 34° 24' 21"N 118° 40' 22"W
Habitat Description:	Stream width ± 28' total (3 braids), Depth ±8", Sandy cobble substrate Open terraces w/ scattered mule fat; Stream edge speedwell/watercress No submergent algae
Species Recorded:	arroyo chub

Appendix A (continued)
Newhall Ranch Specific Plan Area
Fish Survey Data

REACH 1 (continued)

Station # 33	GPS location: 34° 24' 21"N 118° 40' 26"W
Habitat Description:	(Upstream side San Martinez Grande crossing) Stream width ± 40', Depth ±38" (ponded), Silty sand substrate Open mule fat scrub; Stream edge grass, speedwell, duckweed 10-25% submergent filamentous algae
Sample Results:	arroyo chub, UTS (2 adults), prickly sculpin
Station # 34	GPS location: 34° 24' 18"N 118° 40' 33"W
Habitat Description:	Stream width ±12', Depth ±34", Sandy cobble substrate North bank scattered mule fat, willow, tamarisk; South bank grass <10% submergent filamentous algae
Species Recorded:	arroyo chub
Station # 35	GPS location: 34° 24' 18"N 118° 40' 40"W
Habitat Description:	(Split channel, only small channel sampled) Width ±6', Depth ±12" Silty cobble substrate North bank large willows/cottonwood/rush; South bank grass, Watercress, smartweed. No submergent algae
Species Recorded:	arroyo chub, Santa Ana sucker, mosquitofish
Station # 36	GPS location: 34° 24' 18"N 118° 40' 51"W
Habitat Description:	Stream width ±12', Depth ±14", Rocky cobble substrate Outer terraces open with scattered tamarisk and mule fat. Banks grass, smartweed, mule fat 10-25% submergent filamentous algae
Species Recorded:	arroyo chub
Station # 37	GPS location: 34° 24' 14"N 118° 41' 02"W
Habitat Description:	Stream width ±22', Depth ±12", Sandy cobble substrate North bank relatively dense mule fat; South bank grass, smartweed, duckweed. 10-25% submergent filamentous algae
Species Recorded:	arroyo chub, Santa Ana sucker
Station # 38	GPS location: 34° 24' 10"N 118° 41' 06"W
Habitat Description:	Stream width ±18'; Depth ±20"; Sandy cobble substrate North bank open grassy, smartweed; South bank dense willow, tamarisk, cattail <10% submergent filamentous algae
Species Recorded:	arroyo chub, UTS (1 adult male)

Appendix A (continued)
Newhall Ranch Specific Plan Area
Fish Survey Data

REACH 1 (continued)

Station # 39	GPS location: 34° 24' 10"N 118° 41' 16"W
Habitat Description:	(Split channel, only smaller channel sampled) Stream width ±8'; Depth ±14"; Cobble substrate North bank rush/willow; South bank grass No submergent algae
Species Recorded:	arroyo chub

REACH 2

Station # 40	GPS location: 34° 24' 10"N 118° 41' 27"W
Habitat Description:	Stream width ±17'; Depth ±10"; Sandy cobble substrate North bank scattered mule fat/cattail; South bank grass 10-25% submergent filamentous algae
Species Recorded:	arroyo chub
Station # 41	GPS location: 34° 24' 10"N 118° 41' 34"W
Habitat Description:	Stream width ±12'; Depth ±20"; Sandy cobble substrate Both banks relatively dense willow/mule fat/rush 10-25% submergent filamentous algae
Species Recorded:	arroyo chub
Station # 42	GPS location: 34° 24' 10"N 118° 41' 49"W
Habitat Description:	Stream width ±24'; Depth ±10"; Sandy cobble substrate North bank willow/tamarisk/cattail; South bank open sand bar with scattered mule fat, grass, cottonwood seedlings, smartweed No submergent algae
Species Recorded:	arroyo chub, Santa Ana sucker, prickly sculpin, mosquitofish
Station # 43	GPS location: 34° 24' 07"N 118° 42' 00"W
Habitat Description:	(temporary crossing) Stream width ±100'; Depth ±50" Sandy silt substrate Area of ponding at crossing open with grass, duckweed, cocklebur <10% submergent filamentous algae
Species Recorded:	arroyo chub, Santa Ana sucker, UTS (1 adult male), clawed frog

Appendix A (continued)
Newhall Ranch Specific Plan Area
Fish Survey Data

REACH 2 (continued)

Station # 44	GPS location: 34° 24' 03"N 118° 42' 10"W
Habitat Description:	Stream width ±10'; Depth ±14"; Sandy rocky substrate Relatively open terraces on both sides with scattered mule fat, willow, tamarisk, grass, cattail, smartweed No submergent algae
Species Recorded:	arroyo chub
Station # 45 & 303	GPS location: 34° 23' 59"N 118° 42' 14"W
Habitat Description:	(USGS monitoring station) Stream width ±8'; Depth ±12"; Sandy cobble substrate Both banks relatively open with patches of willow, mule fat, smartweed, cattail, grass, duckweed <10% submergent filamentous algae
Species Recorded:	arroyo chub
Station # 46	GPS location: 34° 23' 56"N 118° 42' 10"W
Habitat Description:	Stream width ±40'; Depth ±10"; Sandy cobble substrate Both banks relatively open with patches of willow, mule fat, smartweed, cattail, grass <10% submergent filamentous algae
Species Recorded:	arroyo chub
Station # 47	GPS location: 34° 23' 42"N 118° 42' 25"W
Habitat Description:	Stream width ±18'; Depth ±26"; Silty sand substrate North bank relatively open terrace with mule fat, smartweed, tamarisk. South bank large overhanging oaks, willows, cattail Approximately 50% submergent filamentous algae
Species Recorded:	arroyo chub
Station # 48	GPS location: 34° 24' 03"N 118° 42' 50"W
Habitat Description:	(Split channel, only one channel sampled) Stream width ±18'; Depth ±26"; Sandy cobble substrate Relatively open terraces on both sides of stream with patches of mule fat, willow, tamarisk, arundo. Smartweed, grasses on banks No submergent algae
Species Recorded:	arroyo chub

Appendix A (continued)
Newhall Ranch Specific Plan Area
Fish Survey Data

REACH 2 (continued)

Station # 49	GPS location: 34° 24' 10"N 118° 42' 54"W
Habitat Description:	Stream width ±10'; Depth ±8"; Cobble substrate Outer banks wooded with willows and few cottonwoods, arundo Inner banks primarily grass, smartweed No submergent algae
Species Recorded:	arroyo chub, mosquitofish
Station # 50	GPS location: 34° 24' 14"N 118° 42' 57"W
Habitat Description:	Stream width ±16'; Depth ±10"; Sandy cobble substrate Outer banks wooded with willows, arundo, and few cottonwoods Inner banks primarily grass, smartweed <10% submergent filamentous algae
Species Recorded:	arroyo chub
Station # 51	GPS location: 34° 24' 14"N 118° 43' 01"W
Habitat Description:	Stream width ±6'; Depth ±6"; Sandy substrate Relatively dense outer banks; willows, few cottonwoods, arundo Inner banks grass No submergent algae
Species Recorded:	arroyo chub, mosquitofish
Station # 52	GPS location: 34° 24' 18"N 118° 43' 04"W
Habitat Description:	(crossing, ponded area) Stream width ± 75', Depth ± 72", Silt substrate Outer banks wooded with willows, cottonwood, few oaks, dense understory. Inner banks primarily grass, cocklebur, smartweed, duckweed Dense mats of algae
Species Recorded:	arroyo chub, mosquitofish, largemouth bass, pond turtle
Station # 53	GPS location: 34° 24' 25"N 118° 43' 19"W
Habitat Description:	Stream width ± 6', Depth ± 6", Silty sand substrate Outer banks wooded with willows, cottonwood, arundo, tamarisk Inner banks primarily grass, smartweed, watercress
Species Recorded:	arroyo chub, mosquitofish
Station # 54	GPS location: 34° 24' 32"N 118° 43' 29"W
Habitat Description:	(Split channel, only small channel sampled) Stream width ± 3.5', Depth ± 3", Silty sand substrate Relatively open terraces with scattered mule fat, willow Inner banks primarily grass
Species Recorded:	arroyo chub

Appendix A (continued)
Newhall Ranch Specific Plan Area
Fish Survey Data

REACH 2 (continued)

Station # 55	GPS location: 34° 24' 35"N 118° 43' 33"W
Habitat Description:	Stream width ± 15', Depth ± 8", Cobble substrate Relatively dense wooded outer banks with willow, arundo, cottonwood. Inner banks primarily cattail, small willow
Species Recorded:	arroyo chub
Station # 56	GPS location: 34° 25' 04"N 118° 43' 40"W
Habitat Description:	Stream width ± 12', Depth ± 10", Cobble substrate Relatively dense wooded outer banks with willow, arundo. Inner banks scattered grass, cattail, small willow
Species Recorded:	arroyo chub