Habitat Assessment
for the

Arroyo Grande Creek Flood Control Project

Prepared for:
San Luis Obispo County

July 26, 2000

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1.0 INTRODUCTION

The San Luis Obispo County Engineering Department (County) plans to perform maintenance activities along Los Berros and Arroyo Grande Creek Flood Control Channels. The County is under contract from the Natural Resources Conservation Service (NRCS) to maintain the flood control channels. Whereas the County will, in the future, be pursuing a long-term maintenance strategy with associated permits, this work will focus on the removal of built up sediment from critical areas during the summer of 2000.

The County contracted Essex Environmental to conduct a habitat assessment of the proposed maintenance areas along the flood channel in order to provide information to supplement the environmental permitting process. This document presents the results of the habitat assessment conducted in June 2000.

2.0 PROJECT DESCRIPTION

Arroyo Grande Creek flows west for approximately 13 miles from Lopez Lake to the Pacific Ocean in San Luis Obispo County. The lower 3.5 miles of the original creek was channelized to provide flood control between 1957 and 1959. In addition, an overflow channel was built from Los Berros Creek to the main stem of the Arroyo Grande Creek flood control channel. Both Arroyo Grande Creek and Los Berros Creek flood channels are bordered by manmade levees that provide vehicle access along the channels. Sections of these channels within in the lower 3.5 miles have collected sediment along the levees that is scheduled for removal during the summer of 2000.

The maintenance activity involves removing built up sediments from critical points between the flood control levees. Plans call for using a long-reach excavator to remove the sediment that has accumulated, forming bars and terraces within the flood channel. The excavator will either work from the levee, use existing ramps to access dry areas within the channel, or will track down the levee bank. Since the existing levee provides access along the flood channels, additional excavation for equipment access will not be necessary. In addition, a setback from the edge of the stream channel will be mandatory to prevent access and work from occurring in flowing or standing water.

The Los Berros Creek arm and the Arroyo Grande Creek flood control channel currently contain active flow channels of varying width. During summer flows the Los Berros Creek arm stream width ranges from 3 to 10 feet while the Arroyo Grande Creek stream width ranges from 6 to over 30 feet. Both channels have moderately low gradients creating a flat stream bottom for flows to meander over and gradual to steep banks between levees.

Arroyo Grande Creek is known to contain state sensitive and federally listed species. The focus of this habitat assessment addressed the vegetation communities and the locations of potential habitat for special status fish and herpetofauna species along the lower reaches of the Los Berros arm and Arroyo Grande Creek flood channel (Figure 1.).

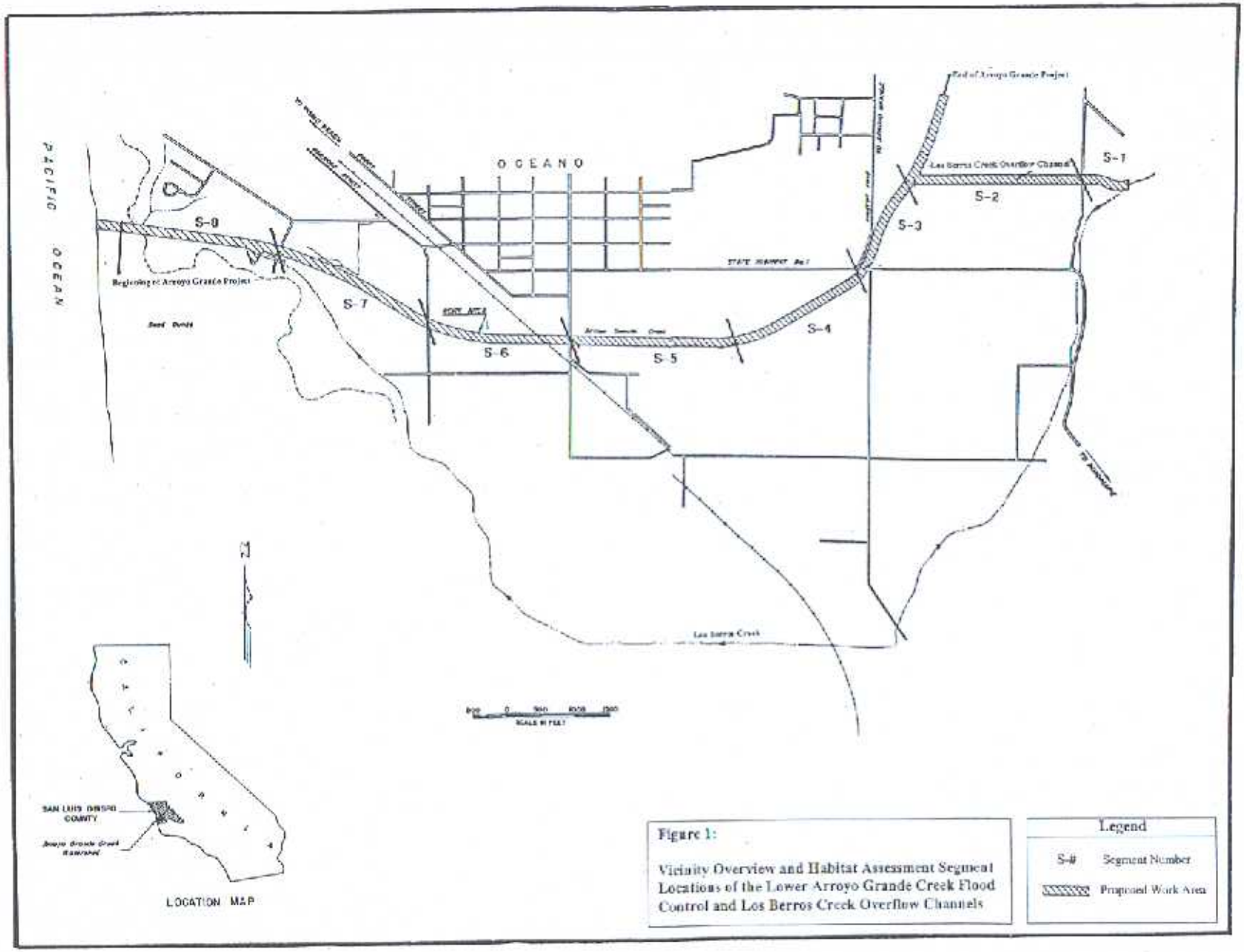

Figure 1:

Vicinity Overview and Habitat Assessment Segment Locations of the Lower Arroyo Grande Creek Flood Control and Los Berros Creek Overflow Channels

3.0 ENVIRONMENTAL SETTING

3.1 Vegetation

A mix of vegetation within the flood channel and along the banks of the levee provide a mosaic of plant communities. The Los Berros arm is predominately bordered by a dense wetland fringe of plants including watercress *(Rorippa nasturtium aquatica)*, American brooklime (*Veronica americana)*, and smartweed (*Polygonum amphibium*). The Arroyo Grande Creek flood channel is also bordered by a similar wetland fringe, but is not as dense. Both creek channels are scattered with pockets of tall species of emergent vegetation including arroyo willow (*Salix lasiolepis)*, bulrush (*Scirpus acutus)*, and broadleaf cattails (*Typha latifolia)*. A mix of riparian and ruderal species grow along the upper banks of both channels. These plants include arroyo willows, coyote brush (*Baccharis pilularis)*, poison hemlock (*Conium maculatum)*, fennel (*Foeniculum vulgare*), and mustard (*Brassica* sp.). A broad mix of these communities exists and is described in the Results Section. In general, the plant communities are spatially distributed by elevation, with more of a ruderal mix in the areas with deeper sediment deposits and the wetland and riparian species closer to the water level.

3.2 Sensitive Plant Species

A total of 20 special-status plant species that are known from the vicinity of the study site were targeted during the initial site assessment. Of these species, only four were considered to have potential to occur in the project area, based on individual species distribution patterns and habitat associations observed within the study area (Table 1).

3.3 Sensitive Wildlife Species

Sensitive fish and amphibian species with federal status were targeted during the assessment. These target species include the south-central California steelhead (*Oncorhynchus mykiss*), tidewater goby (*Eucyclogobius newberryi*), arroyo toad (*Bufo microscaphus californicus)*, and California red-legged frog (*Rana aurora draytonii)*. In addition, state sensitive species and potential habitat were also considered and are included in Table 2. The following section provides a brief life history for the federal listed species.

3.4 South-Central California Coast Steelhead (*Oncorhynchus mykiss*)

The designated geographic boundaries for the south-central California coast steelhead (steelhead) are from the Pajaro River, south to (but not including) the Santa Maria River (DOC 2000). Critical habitat includes all river reaches and estuarine areas accessible to steelhead in coastal river basins. In addition, habitat includes riparian areas adjacent to streams that provide shade, sediment transport, nutrient or chemical regulation, streambank stability, and input of woody debris or organic matter (DOC 2000).

Steelhead spend much of their adult life in the ocean but return to streams to spawn from December through April. Females select a site with clean intergravel flow, then dig a spawning site and deposit eggs. Meanwhile, an attendant male fertilizes them (DOC 2000).

Eggs hatch and fry generally emerge from the gravel in approximately four to six weeks. Newly emerged fry move to shallow, protected areas along a stream margin and then eventually move to feeding locations, which they defend (WPRC 1997). Juvenile steelhead inhabit riffles, but some

larger fish will inhabit pools or deeper runs (Barnhart 1986). Juveniles can remain in fresh water for one to several years before migrating downstream and undergoing physiological changes and entering the ocean. Steelhead spend from several months to three years in the Pacific Ocean before returning to fresh water (WRPC 1997).

Table 1

Special-Status Plant Species with Potential to Occur at the Arroyo Grande Flood Control Project, San Luis Obispo County, California

Species	Status* (Fed/State/ CNPS)	Distribution	Habitat Requirements	Identification Period	Occurrence at Study Site
La Graciosa thistle (*Cirsium loncholepis*)	SC/T/1B	Monterey, Santa Barbara, and San Luis Obispo counties	Coastal dunes, Coastal scrub, marshes and swamps	June-August	Site encompasses limited emergent marsh habitat that is considered marginally suitable to support the species, however, none were encountered at the project site.
Surf thistle (*Cirsium rhothophilum*)	SC/T/1B	Santa Barbara and San Luis Obispo counties	Coastal bluff scrub and coastal dunes	April-June	Site within range of the species, however, site lacks coastal bluff scrub and coastal dune vegetation associated with the species.
Gambel's water cress (*Rorippa gambellii*)	E/T/1B	Santa Barbara, San Diego, San Luis Obispo counties and Baja California	Marshes and swamps	April-September	Site encompasses emergent marsh habitat that is considered suitable to support the species, however, none were observed.
Black-flowered figwort (*Scrophularia atrata*)	SC/--/1B	Santa Barbara and San Luis Obispo counties	Closed-cone coniferous forest, chaparral, coastal dunes, coastal scrub and riparian scrub	April-June	Site encompasses marginally suitable riparian scrub habitat to support the species, however, none were observed.

Federal Listing Code
E Federally Listed as Endangered
SC Federal Special Concern species

State Listing Code
T State Listed as Threatened
-- No listing status

California Native Plant Society Listing Code
1B Rare or Endangered in California and elsewhere

Table 2

Habitat Associations and Assessment Results for Sensitive Fish and Herpetofauna Species with Potential to Occur along the Arroyo Grande Creek Flood Control Channel

Name	Status	Habitat Association	Assessment Results
South central Califoria coast steelhead *(Oncorhynchus mykiss)*	FT, SC, CH	Require cool, deep pools for refuge and foraging through the summer, prior to spawning in the winter. Generally found in shallow areas, with cobble or boulder bottoms at the tails of pools.	Suitable habitat occurs along deep, streamcut margins and pools shaded by shoreline canopy during low flows within the flood channel. Observed 3 juveniles in the lower end of the flood channel.
Tidewater goby *(Eucyclogobius newberryi)*	FE, SC	Requires coastal lagoons with brackish water fed by freshwater inland streams and seasonal ocean water inlets. Clean gravel substrate, oxygenated water, lack of human induced streambed alteration, and lack of non-native predators provides potential survivorship of goby populations.	Marginal habitat occurs in the coastal lagoon, above the mouth of the creek. However, the substrate was heavily silted in spots and several algal mats covered the surface of the water.
Arroyo toad *(Bufo microscaphus californicus)*	FE, SC	Require overflow pools adjacent to the inflow channel of primarily 5th order streams free of predatory fishes. Favors exposed, shallow pools with a minimum of silt and low velocity and are near shaded shoreline or central bars, and stable sandy terraces for burrowing.	Limited/low rated habitat exists in the flood channel and along its banks. Access road crossings provide marginal burrowing habitat. Numerous sand/gravel bars and few sandy banks occurred along the channel bed, however, no shallow backwater areas were observed without containing predator species. Fluctuations in regulated flows may prohibit successful breeding.
California red-legged frog *(Rana aurora draytonii)*	FT, SC	Favors cool pools (>2 ft.deep) with undercut banks bordered by dense vegetation. Requires emergent or submergent vegetation for egg attachment. Requires 4-5 months of permanent water lacking predators for successful larval development.	Marginal habitat exists in limited areas along the flood channel where there are undercut banks, scoured pools, and stream cut margins covered by overhanging and emergent vegetation at low flow.
Southwestern pond turtle (*Clemmys marmorata pallida)*	FSC, SC	Require basking sites such as partially submerged logs, vegetation mats, or open mud banks near slow moving, streams and warm water pools. Needs unshaded banks with dense clayey or silty soils to burrow into and nest up to 650 ft. away from aquatic sites.	Limited suitable basking habitat occurs intermittently along the flood channel. Marginal potential for nesting habitat occurs along the levee banks, but no to poor nesting habitat exists beyond the levee due to agricultural and residential development.
Two-striped garter snake *(Thamnophis hammondii)*	SC	Highly aquatic. Inhabits perennial and intermittent streams with rocky and sandy riverbeds bordered by willow thickets. Will also inhabit stock ponds, lakes, and reservoirs with dense riparian borders. Feeds on fish and amphibian prey. Overwinters in coastal sage scrub and grassland areas near aquatic sites.	Marginal to fair habitat exits along the lower end of the flood channel. A local landowner claims to have observed *T. hammondii* basking on the levee bank near the wastewater treatment facility.

The information used in this table was obtained from the NDDB (2000), Jennings and Hayes (1994), Moyle et al. (1989).

Federal Listing Codes
FE Federally Listed as Endangered
FT Federally Listed as Threatened
FSC Federal Special Concern species

CH Critical Habitat

California Department of Fish and Game Listing Codes
SC California Special Concern species

The south-central California coast steelhead is federally listed as 'Threatened' and is considered a Species of Special Concern with the California Department of Fish and Game (NDDB 2000). In addition, Critical Habitat has been identified for the species. The National Marine Fisheries Service identifies the major factor causing these declines as loss of fresh water habitat. In addition, adverse impacts to south-central steelhead have resulted from urbanization, water impoundment, and diversion (WPRC 1997).

3.5 Tidewater Goby (*Eucyclogobius newberryi*)

Tidewater goby populations are scattered along the California coastline from Del Norte County south to San Diego County (Swift et al. 1989). They are typically found where inland streams feed coastal lagoons containing brackish water with salinity levels at the upper end of less than or equal to 10 percent (Swift et al. 1989). Tidewater gobies occur on sandy substrate in groups of a few to several hundred individuals with no apparent size segregation in shallow water to approximately 3 feet deep. During winter rains and high flows of inlet streams, tidewater gobies have been found up to 5 miles inland (Irwin and Soltz 1984). During summer algal blooms in disturbed or polluted lagoons, most fish are located at the upper end of coastal lagoons where freshwater inflow exists or at the seaward end where occasional high-tide waves wash in from the ocean. However, in relatively undisturbed settings, gobies remain scattered throughout their habitat over sandy substrate (Swift et al. 1989)

Tidewater gobies typically commence breeding in late April or early May where water temperatures are 18-20 degrees Celsius and salinity levels range between 5 and 10 percent. Males require clean, coarse sand to dig vertical nesting burrows for females. Larvae hatch in 9 to 10 days and live in midwater amongst submerged vegetation until they become large enough to live and forage along the benthic layer (Swift et al. 1989).

The tidewater goby is federally listed as 'Endangered' and is considered a 'Species of Special Concern by the California Department of Fish and Game (NDDB 2000). Low vagility, restricted habitat, and a short life span make populations vulnerable to elimination by human induced activities. Streambed channelization and enrichments from agricultural and sewage effluents cause algal blooms and deoxygenation that restrict the habitat area of lagoons in the summer. In addition, non-native predators tolerant of brackish water such as striped bass, largemouth bass, white catfish, and mosquito fish have an adverse impact on tidewater goby populations (Swift et al. 1989).

3.6 Arroyo Southwestern Toad (*Bufo microscaphus californicus*)

The historical range of the arroyo toad extended from the upper Salinas River system in the vicinity of Santa Margarita southward to Baja California, Mexico, and from coastal drainages eastward to the desert slope (Myers 1930; Miller and Miller 1936; Tevis 1944; Sanders 1950; Patton and Myers 1992). In California, they are often associated with open sand or gravel flats near low gradient streams, old flood channels, pools with shallow margins, bars connected to shoreline, and sycamore and oak woodland on upland stream terraces (Sweet 1992).

Arroyo toads breed from late March into early July and larvae may be present from mid June to early September (Sweet 1992). Breeding sites require overflow pools that are adjacent to the inflow channel of third order (or greater) streams that are free of predatory fishes (Sweet 1992). These backwater breeding pools are shallow, have a sand or gravel substrate, and shoreline

margins covered with sparse vegetation. In addition, shoreline or central bars with emergent vegetation such as *Veronica* sp., dried algae mats, and small depressions are required for juvenile arroyo toads seeking refuge. Vertical banks and stable sandy terraces scattered with shrub and tree overstory including mulefat (*Baccharis viminea*), California sycamore (*Plantanus racemosa*), Fremont's cottonwood (*Populus fremontii*), or coast live oak (*Quercus agrifolia)* are necessary for adult toads to disperse to and seek overwintering sites (Hunt 1999).

The arroyo toad is federally listed as 'Endangered' and is considered a 'Species of Special Concern' with the California Department of Fish and Game (NDDB 2000). It has disappeared from approximately 76% of its historic range (Jennings and Hayes 1994). It is likely that the limited availability of specialized habitat and human induced factors such as the development and alteration of streamside flats, creation of reservoirs, artificial stream flow, placer mining, off-road vehicle use, introduction of exotic predators, and cattle grazing threaten remaining populations and in some cases have caused populations to decline (Sweet 1993).

3.7 California Red-legged Frog (*Rana aurora draytonii)*

The range of the California red-legged frog (CRLF) occurs in the Coast Ranges from Point Reyes National Seashore to Ventura County (Storer 1925, Stebbins 1985), with almost all the Central Valley, Sierra Nevada foothill, and southern California populations now extirpated (Stebbins 1985).

The breeding season for CRLFs in stream habitats occurs from November and extends into mid May (Jennings and Hayes 1994). Adult CRLFs utilize aquatic sites for reproduction and adjacent terrestrial habitat, such as riparian thickets on stream terraces, riparian scrub, riparian woodlands, and grasslands for foraging and aestivation. Aquatic habitat is characterized by dense, shrubby, or emergent riparian vegetation, such as arroyo willow (*Salix lasiolepis*), cattails (*Typha* spp.), and bulrushes (*Scirpus* spp.) associated with deep (>2 feet), still or slow moving water. In addition, aquatic sites must contain adequate water depth for an approximate duration of 4 to 5 months in order for CRLF larvae to develop and survive (Jennings and Hayes 1994).

Other important microhabitat features include overhanging streamside vegetation such as willow boughs or snags that contact the water, overhanging banks formed by tree root masses, and burrows or other similar retreat sites at water level that are close to relatively deep, still water. Adult CRLFs are strongly associated with these microhabitats during surface activity (Hayes and Jennings 1989; Jennings and Hayes 1994). Juvenile and subadult frogs appear to favor more open, shallow aquatic habitats with dense emergent and submerged vegetation, as well as ovehanging banks or stick masses (Hunt 1999).

California red-legged frogs are federally listed as 'Threatened' and are considered a 'Species of Special Concern' by the California Department of Fish and Game (NDDB 2000). Human induced factors are responsible for the local and regional decline of the species, including habitat alteration of watercourses and adjacent floodplain terraces, upland habitat for development and flood control purposes, and alteration of natural seasonal streamflow patterns due to dam construction. In addition, the CRLF's decline has also been caused by the widespread introduction of exotic aquatic predator fauna that includes the bullfrog (*Rana catesbeiana)*, crayfish, and an array of fishes such as sunfish (*Lepomis* spp.), mosquito fish (*Gambelia affinis*), and bass (*Micropterus* spp.). (Moyle 1973, 1976; Moyle and Nichols 1973, 1974; Bury and Luckenbach 1976; Jennings and Hayes 1994; Lind et al. 1996; Hunt 1999).

4.0 METHODS

4.1 Literature Review

Prior to performing the assessment, documentation relevant to the project area was reviewed. The California Natural Diversity Database (NDDB) was accessed for information on sensitive plant or wildlife species known to occur in the project area and its immediate vicinity (NDDB 2000). Similarly, the California Native Plant Society's (CNPS) Electronic Inventory was searched for local rare plant records (Skinner, et al. 1994). A list of potentially occurring sensitive plant and herpetofauna species are presented in Tables 1 and 2. Surveyors from Essex Environmental and May Consulting considered the habitat requirements of each species during the surveys. Sensitive species include all listed federal and state endangered and threatened species, and federal and state species of concern.

4.2 Field Survey

Two biologists conducted a site assessment on 12 and 13 June 2000. The assessment area included an approximately 1 mile length of the Los Berros Creek overflow channel downstream to it's confluence with the Arroyo Grande flood control channel, and continued approximately 2.5 miles downstream to the lagoon above the channel's mouth at the Pacific Ocean (Figure 1). The entire 3.5-mile length of the flood channel was divided into eight segments, beginning at the Century Bridge crossing of the Los Berros Arm down to the coastal lagoon at the end of Arroyo Grande Creek. Each segment varied in length depending on the distance between access points from bridges or in the five places where levee roads crossed the channel. Each segment was assessed visually while one person walked in the channel and the other walked and drove along the levee.

The flood control channel was assessed for sensitive biological resources, including plant communities and special-status species including fish, herpetofauna, and their habitats. All areas below the levee roads were assessed during the site investigation. Vegetated habitat types were mapped on photocopies of color aerial photographs at a scale of one-inch equals 50 feet. Potential habitat seen in the channel was also documented for the sensitive fish and herpetofauna species listed in Table 2.

Potential habitat for special status amphibians documented during the day was re-visited during the night of 12 June 2000. Two biologists conducted nighttime eyeshine and auditory surveys for the arroyo toad and California red-legged frog. Survey efforts began one-hour after sunset and ended around midnight. Each person used a 6-volt headlamp and 8x32 powered binoculars to scan the banks and shoreline as they slowly walked together moving upstream in the creek channel. Location, time, weather conditions, temperature, and observations were recorded on Biological Survey data sheets.

In addition, photographs were taken of upstream and downstream views of the Los Berros arm and of the Arroyo Grande Creek flood channel from bridge or road crossings in each segment. These photographs document representative habitat characteristics within and along the flood channels that are proposed to be removed and document any locations of where any sensitive resources were observed (Attachment 1).

5.0 RESULTS

5.1 Habitat Types

The Arroyo Grande flood control channel project area supports the following habitat types:

- Riparian Scrub;
- Riparian Scrub (ruderal);
- Channel Bank (ruderal);
- Emergent Aquatic Vegetation;
- Gravel Bars;
- Unvegetated Open Water;
- Annual Grassland; and
- Landscaped/Developed areas.

These habitat types are described briefly below.

5.1.1 Riparian Scrub

This habitat is a scrubby streamside thicket, varying from open to impenetrable and is dominated by arroyo willow (Holland 1986). The willow canopy forms greater than 80% relative cover while inclusions of coyote brush (*Baccharis pilularis*), poison hemlock, stinging nettle (*Urtica dioica*), and giant cane (*Arundo donax*) comprise a mixed thicket along the flood channel. Fine-grained sand and gravel bars that are close to river channels and ground water are additional factors that characterize riparian scrub (Holland 1986).

Riparian scrub was only encountered at the mouth of the confluence of Arroyo Grande and the sand dunes immediately inland from the Pacific Ocean. In contrast to riparian scrub (ruderal) habitat, riparian scrub is dominated by thick stands of mature arroyo willow forming a canopy cover greater than 80 percent relative cover. This habitat type is dominated by arroyo willow, with inclusions of poison hemlock, stinging nettle, and giant cane.

Riparian scrub provides habitat (e.g., nesting, cover, forage) values for common wildlife species, and shaded aquatic habitat for the steelhead. It also provides potential aestivation sites for the California red-legged frog and nesting/aestivation sites for the southwestern pond turtle and two-striped garter snake.

5.1.2 Riparian Scrub (Ruderal)

This habitat type is one of the most commonly encountered habitat types in the study area. It is characterized as an early succession (pioneer) riparian habitat, dominated by thick stands of poison hemlock and young, low growing willows less than 7 feet tall. Arroyo willow, and poison hemlock dominate this habitat type. Other species encountered as subdominants include stinging nettle, summer mustard, castor bean, and wild radish. Vegetative cover of willows in this habitat type ranges from 5 to 60 percent relative cover in the proposed work areas.

This habitat intergrades with channel bank (ruderal) and emergent aquatic vegetation. Riparian scrub (ruderal) provides only marginal habitat (nesting, cover, forage) values for common wildlife species as well as California red-legged frogs, southwestern pond turtles and two-striped garter snakes.

5.1.3 Channel Bank (Ruderal)

Channel bank (ruderal) is an early successional habitat observed on upper (steep, dry) banks between the road edge and the riparian scrub (ruderal) habitat. This ruderal habitat has been heavily disturbed by human induced activities that promote primarily weedy, non-native vegetation. Characteristic weedy species include fennel, mustard, castor bean (*Ricinus communis*), wild radish (*Raphanus sativa*) and a variety of non-native grasses (*Bromus* sp.). Long-term maintenance of the levee banks causes repeated disturbance, which likely justifies the common occurrence of channel bank ruderal habitat along the lower stretch of the Arroyo Grande Creek flood channel in Segments 3 through 7.

This habitat type intergrades with riparian scrub (ruderal) and emergent aquatic vegetation. Because of its disturbed weedy nature, this habitat provides only marginal habitat (nesting, cover, forage) values for common wildlife species, and is the least likely to support sensitive species.

5.1.4 Emergent Aquatic Vegetation

This habitat type occurs as a band adjacent to the water's edge, and appears to be seasonally influenced by water flows and water elevations. Some areas appearing to be emergent aquatic vegetation on the January aerial photographs were observed in the field to be sparsely vegetated gravel bars during the June survey.

This habitat type is comprised of perennial and annual emergent aquatic species, including watercress (*Rorripa nasturtium-aquatica)*, American brooklime, and water smartweed. Subdominant species observed in this habitat include bulrush, broadleaf cattail, small-seed bulrush *(Scirpus microcarpus)*, and burr reed *(Sparganium euricarpum* ssp. *euricarpum).*

Emergent aquatic vegetation provides important habitat for several common wildlife and aquatic species, and may provide suitable cover for special-status amphibian species including the steelhead, arroyo toad, California red-legged frog, southwestern pond turtle, and two-striped garter snake.

5.1.5 Gravel Bars

Gravel bars are largely unvegetated areas where loose sand and gravel has accumulated within the channel. These areas may be seasonally inundated, and occasionally support early successional individual arroyo willows and emergent aquatic plant species. These areas provide marginal habitat for dependent wildlife species including basking and foraging arroyo toads, California red-legged frogs, southwestern pond turtles, and good habitat for two-striped garter snakes.

5.1.6 Unvegetated Open Water

Unvegetated open water habitat occurred in the flood control channel. This habitat type varied from 2 to 30 feet in width. Several fish species were observed throughout this habitat during the June 2000 survey, including steelhead in Segments 3 and 4.

5.1.7 Annual Grassland

Annual grassland is common throughout the region, occurring as both large and small patches of habitat integrating with numerous other habitat types along the flood channel. It is a community that is dominated by Italian rye grass (*Lolium multiflorum*), perennial rye grass (*L. perenne*), soft chess (*Bromus hordeaceous*), wild oats (*Avena fatua*), annual fescue (*Vulpia octoflora*), and storksbill (*Erodium* spp.). Native forbs that occur as sub-dominants in this habitat include California poppy (*Eschscholzia californica*), lupine (*Lupinus* sp.), and common fiddleneck (*Amsinckia menziesii* var. *intermedia*).

Annual grassland provides limited forage and cover to common wildlife species including the California red-legged frog, and nesting/aestivating southwestern pond turtles and the two-striped garter snake.

5.1.8 Landscaped/Developed Areas

Areas mapped as Landscaped/Developed Areas include roads, artificially disturbed areas, and other artificially created features within the levee bank. Generally, these areas do not provide habitat values to dependent wildlife species, however, the five access road crossings could provide marginal burrowing habitat for the arroyo toad.

5.2 Photographs

Attached are photographs taken from access points that show representative areas that are proposed for removal (Attachment 1). They also include locations of sensitive resources observed during 12 and 13 June 2000. They are referenced to aerial photographs depicting the proposed (numbered) work areas (not attached but submitted under separate cover).

5.3 Sensitive Plant Species and Potential for Occurrence

No special-status plant species were observed in the study area during the June 2000 site visit. Based on the highly disturbed/ruderal nature of vegetation at the site, and the limited amount of habitat type that is considered to have potential to support these four species, the overall potential of the study area to support special-status plant species is considered low. However, detailed surveys conducted during the appropriate identification period for the targeted plant species would be required to conclude presence or absence of targeted plant species at the site.

5.4 Sensitive Wildlife and Potential for Occurrence

5.4.1 South-Central California Coast Steelhead

Three second year sized steelhead were observed in streambed cut margins and in pools, up to 3 feet deep, in Segments 3 and 4. Steelhead were not observed in the Los Berros Creek survey segments, nor in the coastal lagoon. The observations were made where the pools were shaded by arroyo willows and other emergent vegetation, had undercut banks or boulders for refuge, and near areas where there was a low to moderate flowing run or riffle over a clean gravel substrate.

Limited potential habitat occurs within all segments (1-7) of the lower 3.5 miles of the flood channel. During this summer season, the entire length of the flood channel contained flow. Each segment contained at least one potential area for steelhead to either seek cover, forage, or spawn.

These potential areas contained habitat characteristics such as eddy formed pools at least 3 feet in depth, streamcut margins, cover from boulders or submerged vegetation, and clean gravel.

In general, however, the flood control channel lacks an abundance of those habitat characteristics mentioned above. Many of these features have been precluded from development due to the previous flood control maintenance activities. Also the flat gradient of the channel inhibits riffle and pool formation.

5.4.2 Tidewater Goby

Tidewater gobies were not observed within the flood channels nor in the coastal lagoon. Minimal habitat occurs in the coastal lagoon, downstream of the wastewater treatment facility, in areas where the substrate is not silty or where the algal mats do not cover the water surface. It is unlikely tidewater gobies occur in the coastal lagoon or flood channel due to the fluctuating, artificially regulated flows from the Lopez Dam releases and from frequent closure from the Pacific Ocean. Highly channelized systems make it difficult for tidewater gobies to find hiding places from predators and from being washed out (Swift 2000, personal communication). In addition, there are no known historical records for tidewater gobies in Arroyo Grande Creek (Swift 2000, personal communication).

5.4.3 Arroyo Toad

No arroyo toads were observed within or adjacent to the flood channel during our day and nighttime visits.

Habitat along the levees and along most of the flood channel did not appear suitable for the arroyo toad. Arroyo toads require a particular set of habitat features produced and maintained by drainages that range in size from narrow to intermediate. In particular, arroyo toads are dependent on the presence of backwater pools that remain persistent at least into late July and are free of fish or amphibian predators. At summer flow levels, we observed few backwater pools, all of which contained fish predators and lacked nearby refuge and burrow sites. In addition, we observed few gravel bars and sandbars, open shoreline, or stable sandy stream terraces. The only areas offering potential burrowing opportunities were in the five access road crossings in Segments 3 to 7.

Given the close proximity of the proposed work area to the Pacific Ocean and limited availability of potential habitat, it is unlikely arroyo toads occur in the lower reach of the Arroyo Grande Creek flood channel. Arroyo toads are not associated with intermountain valleys and foothill canyons, and are not usually found at locales close to the Pacific Ocean (Sweet 1992, Campbell et al. 1996).

5.4.4 California Red-legged Frog

California red legged frogs are known to occur in Arroyo Grande Creek, just below the Lopez Dam and approximately 5 miles upstream (Ceccetti Road crossing) from the assessment area (Alley 1996). No California red-legged frogs were observed during the daytime and nighttime reconnaissance level surveys of the lower 3.5-miles of the flood channel. One subadult sized bullfrog (*Rana catesbeiana*) was observed basking on a willow trunk, above an approximately 3 foot deep stream cut pool with submerged vegetation, undercut banks, and low flow. In addition to the bullfrog, other incidental amphibian observations included several chorusing and basking

Pacific chorus frogs (*Pseudacris [= Hyla] regilla*) and one western toad (*Bufo boreas*) adult and several larvae.

The lower 3.5 miles of the flood channel predominately offers potential foraging CRLF habitat in all segments. Segments 2, 3, 4, 6, and 8 had limited potential breeding habitat. Segment 8 includes the coastal lagoon area downstream of the work area. The potential for breeding to occur in these areas is limited by the presence of bullfrogs (Segment 4), predatory fish (all Segments), and fluctuating stream flows from the Lopez Dam releases. While there is potential for negative impacts to CRLFs from these predatory species introduced into Arroyo Grande Creek, it cannot be concluded that introduced predators are a greater factor than existing habitat conditions in determining the present distribution pattern of CRLFs at this site (Christopher 1996).

5.4.5 Southwestern Pond Turtle

Southwestern pond turtles have been observed at the spillway pool below Lopez Dam (Alley 1996). However, no turtles were observed downstream during this assessment. Limited suitable basking habitat occurs intermittently along the flood channel where slow flowing pools and slackwater contain submerged logs, boulders, or floating vegetation. Limited potential for nesting habitat occurs along the levee banks in riparian scrub, but no to poor nesting habitat exists beyond the levee due to agricultural and residential development.

5.4.6 Two-striped Garter Snake

No two-striped garter snakes were observed during the site assessment of the lower 3.5-mile section of the flood channel. Marginal to fair habitat for the two-striped garter snake exists along the lower end of the flood channel where strips of willows and carpets of watercress emerge along the streambed shoreline and upland riparian scrub offers overwintering hibernation sites. A local resident claims to have seen a two-striped garter snake basking on the levee bank at access road number 5, near the wastewater treatment facility (Segment 8).

6.0 POTENTIAL IMPACTS and RECOMMENDATIONS

Maintenance activities will require the removal of plant communities on built-up terraces that encompass approximately 13 acres within the Arroyo Grande Creek flood control channel. This amounts to approximately 26.5 percent of the total surface area within the levees. Somewhat less than 13 acres will ultimately be removed due to the ten-foot setback that has been proposed. Whereas a precise accounting has not been performed, the vast majority of the sediment removal areas contain channel bank (ruderal) and riparian scrub (ruderal) vegetation types, with a small amount of more mature riparian scrub. No emergent aquatic vegetation, gravel bars, or open water habitat will be impacted during maintenance.

Plant communities and habitats can be ranked in terms of the value they provide to wildlife in general and sensitive species in particular. Given the aquatic nature of the sensitive species with potential to occur within the flood control channel, the open water habitat and the emergent aquatic vegetation community, which contain instream cover (e.g. boulders and submerged logs) would be considered to provide the highest value. The proposed maintenance activities are not expected to directly impact these areas. Riparian scrub also provides high wildlife value for reasons previously discussed. Three of the thirty-two areas targeted for sediment removal contain this vegetation type and will be directly impacted by maintenance. The majority of the sediment

removal activities will occur within the channel bank and riparian scrub areas that are dominated by ruderal vegetation. These plant communities will be directly impacted during sediment removal activities, but are also the areas that provide the least habitat value for wildlife. Removing sediment may encourage recruitment of wetland plant species, which over time could benefit sensitive herpetofauna and fish.

Indirect impacts to the aquatic and semi-aquatic habitats could occur if there is a loss of shade and cover due to removal of upland vegetation, or if the project results in an increase in sedimentation. The removal of accumulated sediment and strips of vegetation will result in exposing loose surface material along the banks, making it vulnerable to increased sediment transport during winter flows.

Increased sedimentation occurs naturally in coastal streams such as Arroyo Grande Creek during high winter flows. In addition, the Arroyo Grande Creek flow channel tends to meander within the levees resulting in a natural process of sediment transport and redistribution. Disturbing the sediment terraces that have accumulated in the channel and removing vegetation would likely accelerate the natural process for the channel to meander within the levees. The hydrologic mechanisms of sediment transport within the channel are not precisely known, but any increase in transport would be expected to be temporary and of a short duration the winter following the proposed action. Furthermore, sediment accretion will likely occur within areas where sediment terraces are removed, partially offsetting increases from disturbance.

6.1 Tidewater Goby and South-Central California Coast Steelhead

6.1.1 Direct Impacts

The County will not be working in the stream or removing sediment or vegetation in or along the banks of the coastal lagoon. Therefore, no direct impacts are anticipated to the tidewater goby (if present) or the steelhead.

6.1.2 Indirect Impacts

Loss of shade and cover could result in increased water temperatures in pools or loss of areas to seek shelter from predators. Currently, only minimal shade is afforded by riparian strips growing along the margins and the majority of these areas should be avoided by maintaining the ten-foot setback. No instream cover will be affected by the proposed action.

The affect of the project action on sedimentation is not certain, although any increase would be expected to be of a short duration. Uncaptured sediment from storm runoff or erodable surface material may settle across the stream bottom, in existing pools, or in the coastal lagoon causing impacts to potential spawning habitat for the special status fishes. Increased sedimentation during the winter months is a naturally occurring process and whereas the proposed action may result in a short-term increase in sedimentation, it is not expected to dramatically alter this process over the long-term.

The removal of riparian habitat also may indirectly impact the steelhead by decreasing canopy cover that currently provides minimal shade. Whereas, if left to grow, the riparian habitat would enhance the quality of what shade/cover habitat presently exists.

6.1.3 Recommendations

Riparian vegetation along the flood channel banks that currently provides minimal shade/cover over the water should be preserved. Allowing these few stands to remain may enhance the quality of existing cover for the steelhead and possibly the tidewater goby. Expanding the ten-foot setback where riparian vegetation is in a successional growth stage or where it provides suitable habitat for sensitive species should also be implemented on an as needed basis during excavation. The proposed work will focus on removal of sediment and ruderal vegetation along the upper levee banks, leaving as much riparian vegetation as possible. An on-site resource monitor should be present during all work activities and to make recommendations as needed.

6.2 Arroyo Toad, California Red-legged Frog, Southwestern Pond Turtle, and Two-striped Garter Snake

6.2.1 Direct Impacts

Riparian scrub, annual grassland, and ruderal plant communities may provide limited foraging, burrowing, or nesting habitat for California red-legged frog, southwestern pond turtle, and two-striped garter snake. The removal of the vegetative cover and substrate from the levee banks may have a direct impact on these sensitive resources if they are present.

The five access roads crossing the flood channel serve as marginal burrowing habitat for the arroyo toad. These road crossings are currently used by farm equipment and will be used by construction equipment for access. This activity poses a direct impact to migrating or burrowing arroyo toads, if they are present.

The County will not be working in the stream or removing sediment or vegetation in or along the banks of the coastal lagoon. Therefore no direct impacts are anticipated to sensitive herpetofauna occupying aquatic sites.

6.2.2 Indirect Impacts

Whereas long term build up of sediment fines may decrease the minimal amount of any potential breeding habitat for the California red-legged frog, expansive areas consisting of mostly ruderal plant species are proposed for removal. Removing these ruderal areas may provide open areas for future sediment capture in the flood channel and may increase potential breeding habitat by providing backwater pools.

The removal of riparian habitat may also indirectly impact the California red-legged frog, southwestern pond turtle, and two-striped garter snake by decreasing canopy that currently provides cover and minimal shade. Whereas, if left to grow, the riparian habitat would enhance the quality of what shade/cover habitat presently exists.

6.2.3 Recommendations

Preconstruction surveys should be performed to determine the presence of sensitive herpetofauna that may occupy potential habitat along the levee banks and in the channel. Surveys should follow a modified version of the *1997 USFWS California Red-legged Frog Survey Guidelines* where one day and two nighttime surveys will be conducted before maintenance activities begin. Surveys for the other sensitive herpetofauna will be done concurrently with the CRLF surveys. A

biological monitor should be on site to examine areas before and during work to ensure avoidance of the sensitive resources.

In the event any resources are found, a 100-foot exclusion area around the location where the resource was found should be implemented. In the event a federally listed resource is discovered in the work area during excavation, all work in that area will cease and the USFWS will be notified immediately.

Riparian vegetation along the flood channel banks that currently provide minimal shade/cover over the water should be preserved. Allowing these few stands to remain may enhance the quality of existing cover and potential basking sites for the California red-legged frog, southwestern pond turtle, and two-striped garter snake. Expanding the ten-foot setback where riparian vegetation is in a successional growth stage or where it provides suitable habitat for sensitive species should also be implemented on an as needed basis during excavation. The proposed work will focus on removal of sediment and ruderal vegetation along the upper levee banks, leaving as much riparian vegetation as possible. An on-site resource monitor should be present during all work activities and to make on-site recommendations as needed.

6.3 Long-Term Recommendations

The County is planning for the long-term maintenance of the flood control channel. The long-term plan will incorporate measures for providing the required flood control protection while enhancing and preserving habitat for wildlife. This initial step designed to alleviate the current flooding hazard should incorporate measures that can be tested as to their ability to meet the long-term criteria. Consequently, before work begins, additional data should be collected to document the current conditions and follow-up surveys conducted to determine the maintenance effects. The following recommendations should be implemented:

- Additional surveys should be performed to document the current quality of instream steelhead habitat. Documenting the quality of existing habitat occupied by the steelhead in the Arroyo Grande Creek flood channel will provide useful baseline information for future long-term resource management needs.
- Whereas recent aerial photos of the channel are available, additional aerial photos should be taken the year following the maintenance activity to document changes that are produced.
- Hydraulic models that are being prepared should be compared with actual effects to determine the efficiency of the models.
- Dense stands of willows left in place should be selectively pruned to encourage height and discourage "bushiness," thereby providing potential habitat that is more compatible with flood control requirements.
- Maintenance activities will remove a significant amount of undesirable vegetation (i.e., kikuyugrass (*Pennisetum clandestinum*), giant cane, and castor bean). These areas should be revegetated with native species and monitored to determine appropriate long-term strategies for discouraging invasive species.
- Surveys should be conducted the year following the maintenance activity to document development of habitat features that are more favorable to herpetofauna and fish. Report should be prepared to document changes and provide recommendations for future monitoring and habitat enhancement efforts.

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Attachment 1

Photographs of Representative Habitat Characteristics Proposed for Removal and General Locations of Sensitive Resources Along the Los Berros Creek Overflow Channel and Arroyo Grande Creek Flood Control Channel

12-13 June 2000

Photo 1: Segment 1. Upstream view of Los Berros Creek overflow channel from Century Lane bridge crossing. Sediment with riparian/ruderal scrub in left and center of photo is proposed to be removed from work area 1.

Photo 2: Segment 1. Downstream view of Los Berros Creek overflow channel from Century Lane bridge crossing. Sediment with riparian/ruderal scrub on both sides of the upper bank of levee are proposed to be removed from work areas 2 left and 3 left.

Photo 3: Segment 2. Downstream view of Los Berros Creek overflow channel from Valley Road bridge crossing. Sediment with riparian/ruderal scrub on right side of photograph is proposed for removal in work area 6.

Photo 4: Segment 3. Upstream view of Arroyo Grande Creek flood control channel from Highway 1 crossing. Sediment with riparian/ruderal/channel bank scrub along right side to center of photo is proposed for removal from work area 11. Steelhead observed along boulders in center of photo.

Photo 5: Segment 4. Upstream view of Arroyo Grande Creek flood control channel from access road crossing #3. Sediment with riparian/ruderal scrub in left of photo is proposed for removal from work area #14. Steelhead observed in stream, under willow clump on left side of photo.

Photo 6: Segment 5. Downstream view of Arroyo Grande Creek flood control channel from access road crossing #3. Sediment with riparian/ruderal scrub along right bank in photo is proposed for removal from work area #15

Photo 7 Segment 5. Upstream view of Arroyo Grande Creek flood control channel from 22nd Avenue Bridge. Sediment with riparian/ruderal scrub along left bank in photo is proposed for removal from work area #18.

Photo 8 Segment 5. Downstream view of Arroyo Grande Creek flood control channel and railroad crossing from 22nd Avenue Bridge. Sediment with riparian/ruderal scrub on right in photo is proposed for removal from work area #19.

Photo 9: Segment 6. Downstream view of Arroyo Grande Creek flood control channel from railroad crossing. Sediment with riparian/ruderal/channel bank scrub in foreground of photo is proposed for removal from work area #20.

Photo 10: Segment 6. Upstream view of Arroyo Grande Creek flood control channel from access road crossing #4. Sediment with riparian/ruderal scrub along left bank of channel is proposed for removal from work area #24.

Photo 11: Segment 7. Upstream view of Arroyo Grande Creek flood control channel from access road crossing #5. Sediment with riparian/ruderal scrub on left bank is proposed for removal from work area #28.

Photo 12: Segment 8. Downstream view of Arroyo Grande Creek flood control channel from access road crossing #5. Sediment with riparian/ruderal scrub on right bank in photo is proposed for removal from work area #29.

Photo 13: Segment 8. Upstream view of Arroyo Grande Creek flood control channel from north bank of levee. Sediment with ruderal scrub patch on left bank, on center of photo is proposed for removal from work area #32.

Photo 14: Segment 8. Downstream view of Arroyo Grande Creek flood control channel from north levee bank. This area is not proposed to be removed.