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Upper Salinas-Las Tablas Resource Conservation District

Watershed Fisheries Report and Early Actions

A Study of the Upper Salinas River and Tributaries

UPPER SALINAS RIVER AND TRIBUTARIES

Watershed Fisheries Report
and Early Actions

Report to the California Department of Fish and Game

Upper Salinas-Las Tablas Resource Conservation District

Prepared in cooperation with
Monterey Bay National Marine Sanctuary
Upper Salinas River Watershed Task Force
Upper Salinas River Watershed Technical Advisory Committee
Upper Salinas Watershed Coalition
California Department of Fish and Game
State Water Resources Control Board
Regional Water Quality Control Board
USDA Natural Resources Conservation Service
American Watersheds

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CHAPTER I
Introduction

UPPER SALINAS RIVER AND TRIBUTARIES

Watershed Fisheries Report and Early Actions

SB 271 Grant Report

CHAPTER I INTRODUCTION

This report examines the current conditions affecting the health of Southern steelhead in the Upper Salinas River. The Salinas River is the largest river system on the central coast of California, flowing northward 170 miles from San Luis Obispo County, through Monterey County and emptying into Monterey Bay near the town of Marina. With a total watershed area of approximately 4,160 square miles, it is more than twice the size of any other river system from San Mateo to Santa Barbara. Originally named Rio Santa Delfina by early explorers and soldiers, it was later named Rio Monterey by the explorer Portola. Because of the salt beds near Monterey Bay, the river was eventually renamed Salinas.

The river has been the subject of various authors, such as John Steinbeck and Anne B. Fisher. Mrs. Fisher provided a thorough chronology of the history of the Salinas Valley in her book, *The Salinas, Upside Down River*, written in 1945. She called it the "upside down river" because it flows north, while most western rivers flow west or south. In "California Rivers, A Public Trust Report" prepared by the California State Lands Commission in 1993, the Salinas River is described as one of the "largest submerged rivers" in the United States because of its significant subsurface flow.

The principal tributaries of the Salinas River are the Estrella River which drains the large arid eastern region of San Luis Obispo and southeastern Monterey Counties; the Nacimiento River, the San Antonio River and the Arroyo Seco River which originate in the wet Santa Lucia Mountain Range along the coast; and the San Lorenzo River which flows from the Gabilan Range east of King City.

The Salinas has been listed as a "Category 1, Impaired Watershed" and one of the most critical rivers in California by the State Water Resources Control Board due to its degrading condition and the impacts of nonpoint pollution on water quality. Around the beginning of the 20th century, the Salinas River and tributaries supported a large population of steelhead trout. Today, only small populations of steelhead remain in a handful of the Upper Salinas tributaries. The factors leading to the decline of steelhead and a list of actions that can help in the recovery of this anadromous fish are the subject of this report.

Healthy Stream Channel, Atascadero Creek near Highway 41 at the 3 bridges area

In the early 1940's, the Salinas River was dammed near the town of Santa Margarita to provide water for the community of San Luis Obispo as well as the nearby Camp San Luis Obispo military training facility. During the 1950's, the Nacimiento and San Antonio Rivers were also dammed. The Monterey County Water Resources Agency operates both the Nacimiento and San Antonio Dams, using the water to recharge groundwater basins in the lower Salinas Valley. Prior to its damming, the Nacimiento River was known to have one of the largest populations of steelhead in the Salinas Watershed. The three dams had a dramatic affect on steelhead populations because the dams excluded steelhead from upstream habitat, there was reduced available water in downstream rivers, there were reduced gravels and cobbles in downstream channels, and other changes that impacted steelhead. The dams are believed to be a major reason for the decline in steelhead in the Upper Salinas River.

Since the late 1700's, the Upper Salinas River valley has been used for agriculture and is now one of the most productive valleys in the world. Urban centers of Paso Robles, Atascadero, San Miguel, Templeton, Santa Margarita and Shandon have experienced significant growth during the last half of the 20th century. The Upper Salinas Watershed has been transformed by these changes. Steelhead fisheries within the Salinas River and tributaries have declined over a number of years. Eroded soil has polluted streams and riparian vegetation has disappeared. Trespass and vandalism have become rampant and contributed to the overall degradation of water supply and quality (California State Lands Commission, 1993).

In 1991, local citizens organized a planning effort to look at problems in the Salinas Watershed. A Coordinated Resource Management and Planning (CRMP) process resulted in an initial planning program for the Upper Salinas Watershed. In 1998 a number of individuals and agencies started the Upper Salinas Watershed Coalition. Their efforts were to renew the watershed planning effort started by the CRMP. More recently, an Upper Salinas Task Force was formed, comprised of the many stakeholders in the region. An Upper Salinas Technical Advisory Committee was appointed to provide guidance to the Task Force and the Resource Conservation District.

The Salinas River is also part of a larger planning effort involving the watersheds that affect the Monterey Bay National Marine Sanctuary. The Salinas River Watershed is the primary source of both freshwater and fine sediment in Monterey Bay. The health of the Salinas River is critical to the health of Monterey Bay. The Upper Salinas-Las Tablas Resource Conservation District (US-LT RCD) is coordinating their planning of the Upper Salinas watershed with the planning for the larger region, working with agencies and organizations such as the Natural Resources Conservation Service, the Department of Fish and Game, the Regional Water Quality Control

Board, the State Water Resources Control Board, the Farm Bureau, the Nature Conservancy, and many others.

Offroad vehicles in the Salinas River have destroyed habitat and polluted the water

This report contains a list of "Early Actions" intended to continue the process of improving the conditions for steelhead and improving water quality. The next step in the planning process will be the preparation of a watershed resource conservation management plan for the region.

CHAPTER II
Steelhead in the Upper Salinas Watershed

CHAPTER II STEELHEAD IN THE UPPER SALINAS WATERSHED

A. Steelhead Background:

Steelhead trout (*Oncorhyncus mykiss*) is an anadromous salmonid that migrates to sea and later returns to inland waters as adults to spawn (Li, 1998). In the ocean steelhead migrate north along the continental shelf, pass in a great eastern/southern crescent around the Gulf of Alaska, continue south along the shelf of the Aleutian Island chain to a vast marshaling ground near 50' N latitude and 170' W longitude. In this area of the Pacific Ocean they mingle with steelhead from other North American streams, and the Asian steelhead from streams on the Kamchatka Peninsula. When they migrate back, they reverse the journey or make a direct line back to North American shores, then travel south until they reach the estuary of their home stream (Thornton, 1996).

This species has two distinct races, winter steelhead and summer steelhead, so named because of the season of the year these fish enter their home streams (McEwan & Jackson, 1996; CALFED, 1998; Thornton, 1996).

Winter steelhead begin ascending their natal streams as early as November, and the runs continue through April; some rivers actually have winter steelhead entering their system as late as June. Summer steelhead begin to enter their home rivers in June and continue through October. Spawning for both races occurs throughout the winter months in fist sized gravel. Unlike Pacific salmon, steelhead are able to reverse the chemical and physical changes that occur prior to the spawning, and can survive to spawn the following season (Thornton, 1996).

The California Department of Fish and Game (CDFG) has classified steelhead into seasonal runs according with their peak migration period. In California there are well defined winter, spring, and fall runs. Summer steelhead are present only in north coast drainages. Winter steelhead are present in north coast drainages, the Sacramento River Watershed, the central and south Coast Drainages, and in the Salinas Watershed (McEwan & Jackson, 1996; CALFED, 1998; Dave Higland - CDFG, personal communication).

Spawning populations of steelhead are found in coastal rivers and streams from Southern California to the Smith River near the Oregon Border, in the Sacramento, and the Salinas River Watersheds. These locations are typified by light current flow, and instream structures such as ledges, troughs, logs, and large boulders (McEwan & Jackson, 1996; Thornton, 1996; CALFED, 1998; Highland, Marshall & Nelson, 1999; Franklin,1999, Penrod, *et.al.*, 2000).

The genetic stock of steelhead in the Central Valley has likely been depleted due to cross-breeding by hatchery and steelhead trout. Significant records of historical distribution and abundance have not been published (Li, 1998; McEwan & Jackson, 1996).

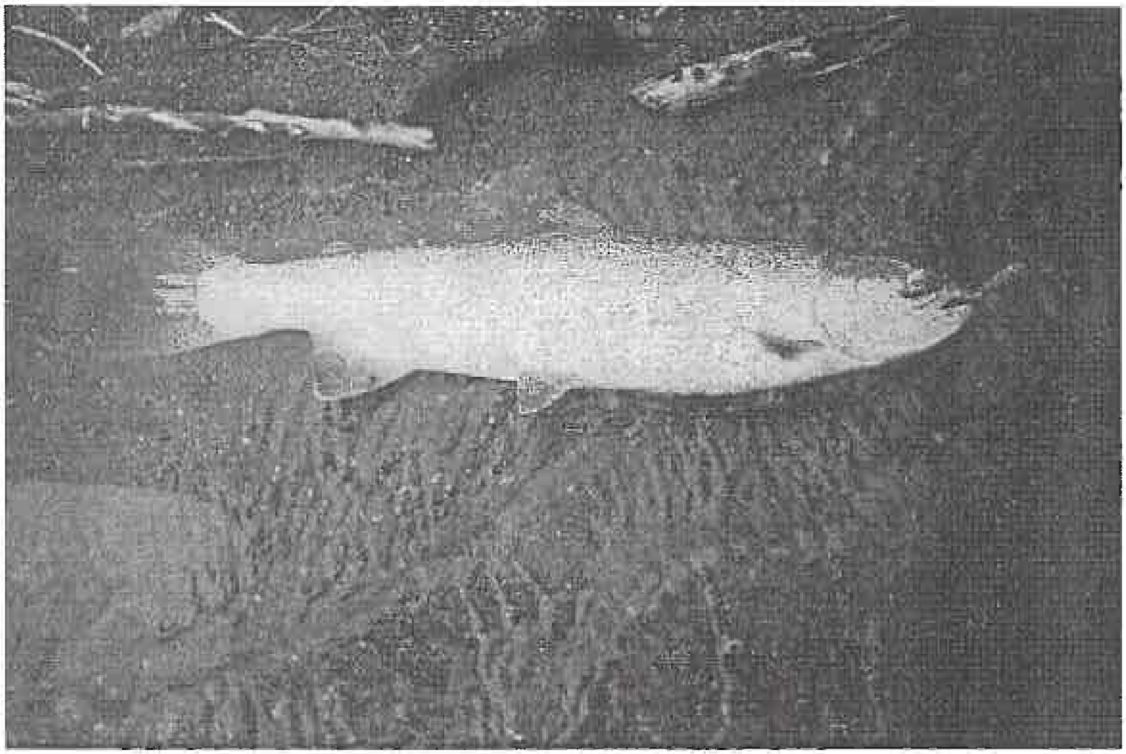
The anadromous life history pattern probably confers a survival advantage to steelhead, especially in unstable variable climate and hydrographic conditions, which exist in the Salinas River Watershed. The Salinas River is a special "upside-down river", because it flows northward, and for long stretches it flows underground. Shortages and abundance of water-droughts and floods are part of the history of the Salinas Central Valley (McEwan & Jackson, 1996; CALFED, 1998).

Li (1998), and McEwan & Jackson (1996), reported that steelhead prefer to spawn in clean, loose gravel and swift water as shallow as 0.75 foot, with velocity of 1.5 feet per second. This species is less tolerant than other anadromous salmonids of sediment in the gravel, probably because the eggs are smaller and the oxygen requirements for developing embryos are higher.

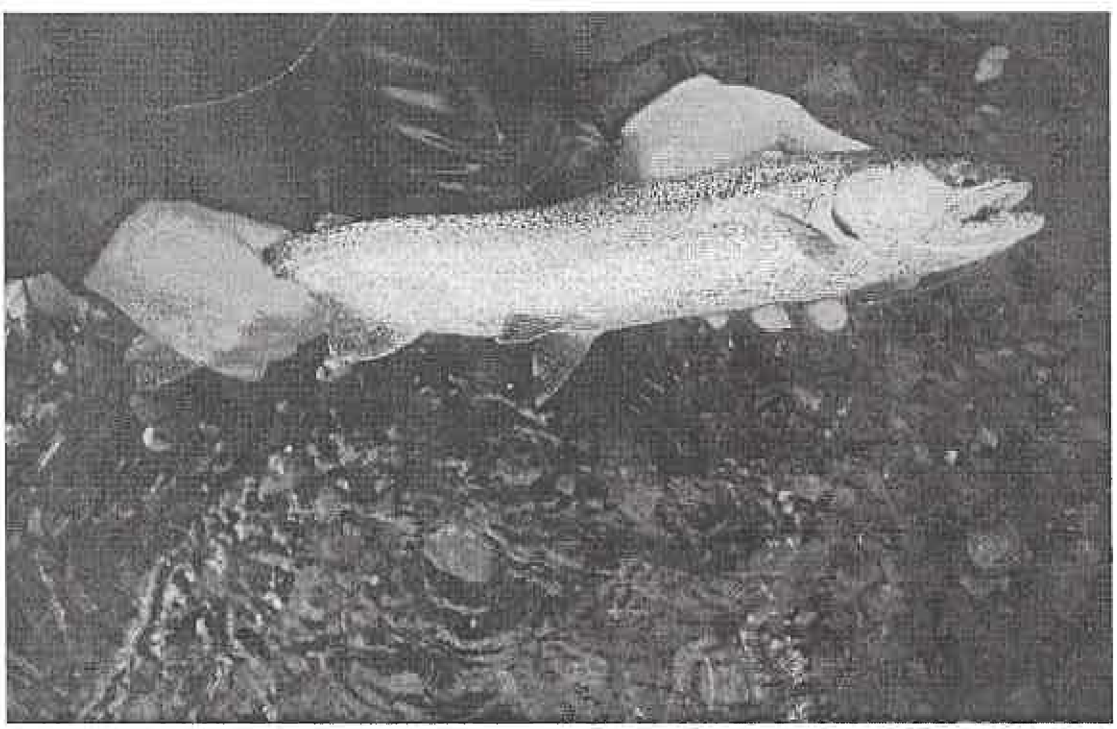
Loss of vegetation in the riparian corridors could be one of the factors that is contributing to increases in stream temperatures and the disappearance of steelhead. The temperature requirements for this species depend on the season and life stage. The optimal temperature for spawning is generally between 39 ^{o}F to 55 ^{o}F and the optimal temperature for incubation is 50^{o}F. The optimal temperature range for fry and juvenile rearing is from 45^{o}F to 60^{o}F, and a sudden change in stream temperature generally results in high mortality of the embryos. The optimal temperature for smoltification is 57^{o}F (Li,1998; McEwan & Jackson,1996).

Factors impacting the survival of steelhead include dams, concrete structures in creeks or improperly placed culverts, and road crossings. Other significant factors include lack of riparian vegetation, erosion and sedimentation, increase in predator populations, fences across creeks, improper management practices, and urban development. In several creeks in the Upper Salinas Watershed, steelhead migrations have been interrupted by barriers as well as by damage to their habitat. Steelhead populations are a true barometer of the health of watersheds and of the ocean (McEwan & Jackson, 1996; Thornton, 1996; CALFED, 1998; Highland, Marshall & Nelson, 1999; Franklin,1999).

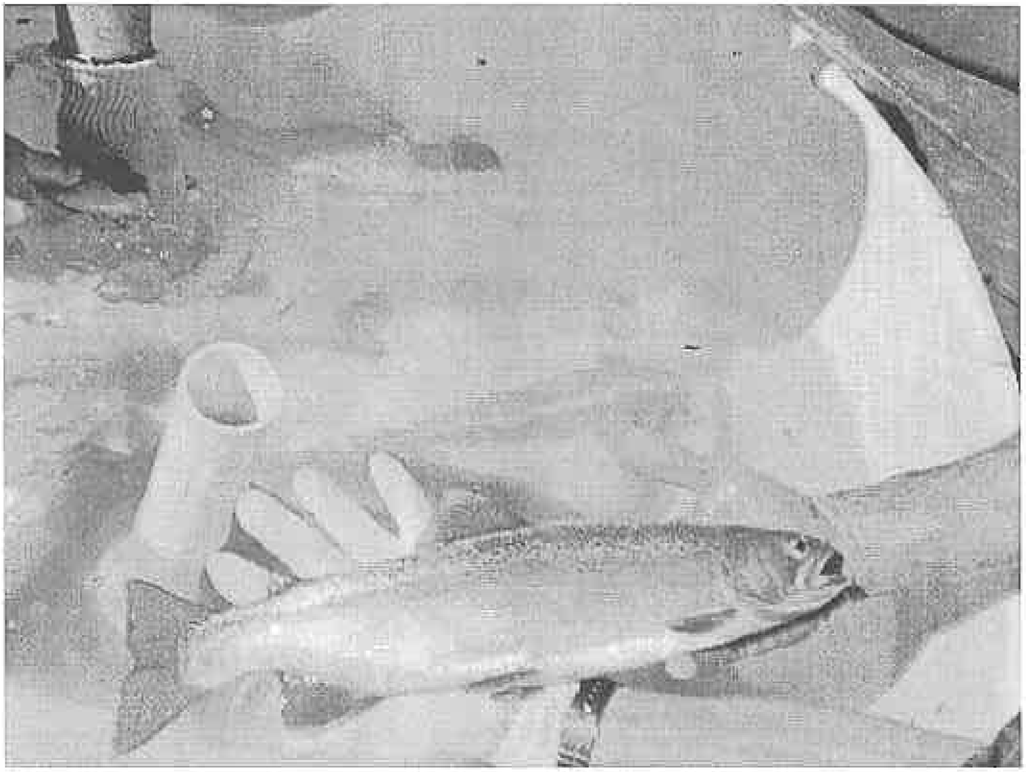
The natural hydrography of the upper Salinas River has been altered by agricultural and municipal water development, and steelhead populations have been impacted by dams blocking access to the head waters of the Salinas River and its tributaries. In addition these dams turned hundreds of miles of rapidly moving water into slow, calm pools. Steelhead are not adapted to slow water migrations. Inadequate stream flows due to excessive diversions, increased water temperature, logging, mining, and irrigation have also made the amount of spawning and rearing habitat available negligible compared to historic levels (McEwan & Jackson, 1996; Di Silvestro,1997; Franklin, 1999).



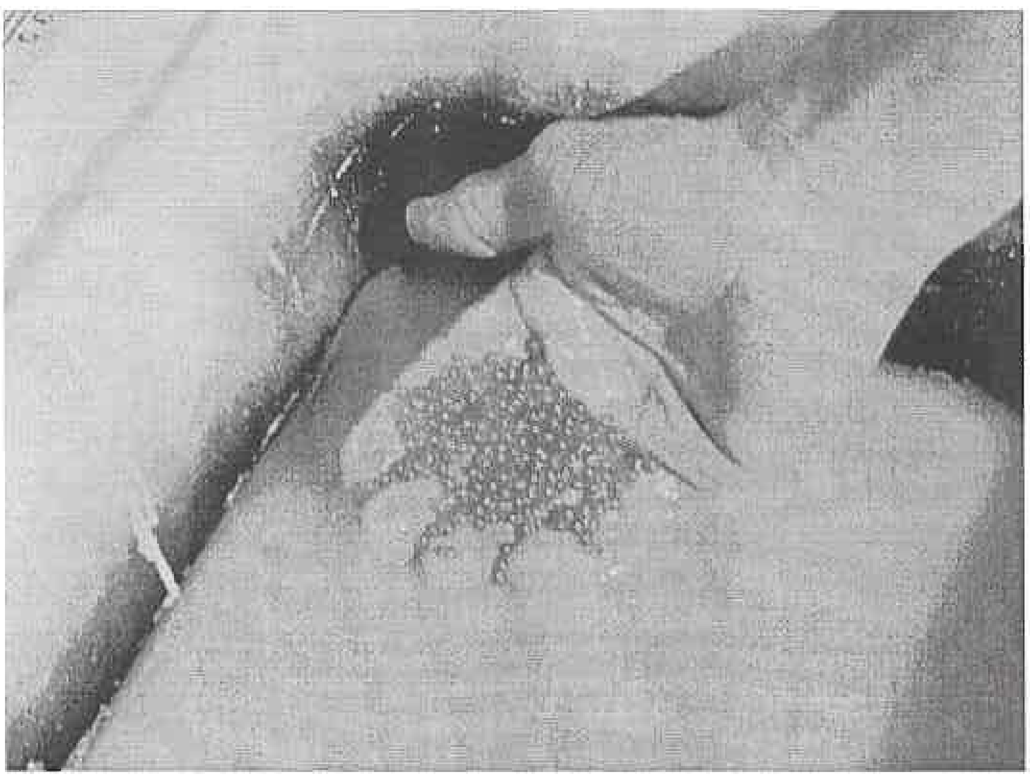
Female central coast Steelhead



Male central coast Steelhead



Preparing to milk female central coast Steelhead for roe



Fertilized eggs collected from central coast Steelhead in preparation for spawning

The Upper Salinas - Las Tablas Resource Conservation District , with the support of the California Department of Fish and Game has organized quarterly task force meetings to document issues affecting steelhead in the Upper Salinas Watershed. Stakeholders include the Natural Resources Conservation Service, California Conservation Corps, Regional Water Quality Control Board, Atascadero Water Mutual Company, other local, state and federal Agencies, ranchers, farmers, urban development groups, and people dedicated to enhancement of water quality and steelhead habitat in the region.

B. History of the Steelhead in the Upper Salinas River Watershed:

Records about the steelhead populations and migrations in the Upper Salinas River Watershed have not been published. CALFED (1996) reported that there is little explicit documentation of historical distribution of steelhead in the California Central Valley, including the Salinas Valley.

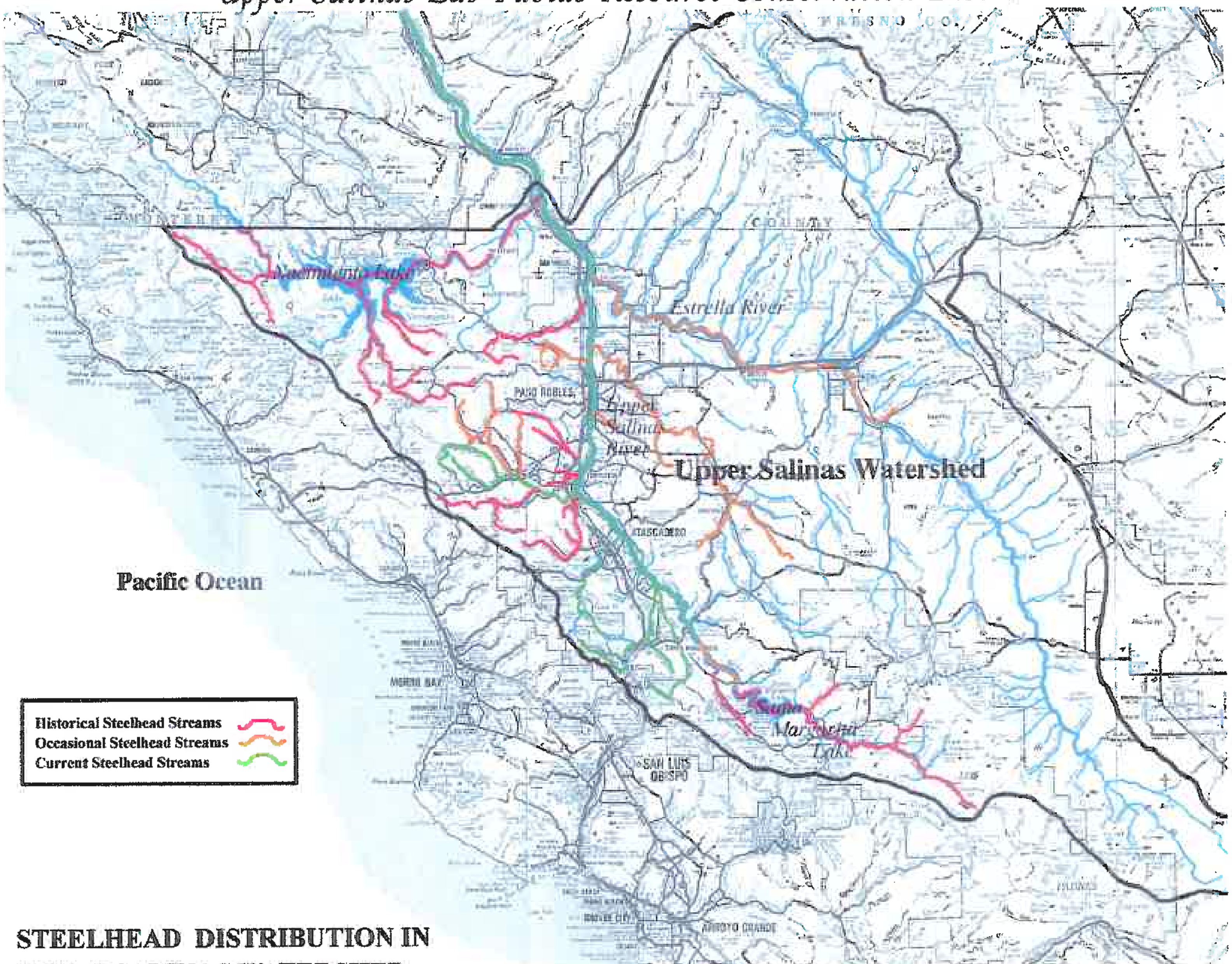
However, notes from files, provided by Mr. Mike Hill from the California Department of Fish and Game compiled information with descriptions, amounts and locations of steelhead in the Salinas Watershed since 1947. In addition, Mr. Harold Franklin (1999), a former sciences teacher, wrote an unpublished article about the history of steelhead in this watershed. This article summarizes interviews with families who have settled this region since the late 19th century.

Historically, the Salinas River had an annual migration of steelhead trout and Chinook salmon. These anadromous fish found their way up the Salinas River to streams (where they were born several years earlier) in order to spawn and continue their populations. Few steelhead are still fighting with "the human civilization structures and activities", to follow their ancestors' riffles and perpetuate this species in the Upper Salinas Watershed. The salmon run seems to have ended in about 1915 (Franklin, 1999).

Opportunities for steelhead angling depended on sufficient rainfall, but few years had sufficient rainfall. Even though tributary streams provided considerable flows during the winter months the lower 10 - 15 miles of the Salinas River frequently remained dry, with the flows from tributaries being taken into the ground water basin. Most of the steelhead passed through the Salinas river when the waters were higher, but when the water dropped and cleared, it was very easy to catch steelhead (Franklin, 1999).

The following map indicates historical and current locations for steelhead in the Upper Salinas River watershed:

Upper Salinas-Las Tablas Resource Conservation District



STEELHEAD DISTRIBUTION IN UPPER SALINAS WATERSHED

B.1. Historical records of Steelhead in the Nacimiento River and other tributaries in western San Luis Obispo County near the Monterey County line:

The Nacimiento River (which is now constrained by the Nacimiento Reservoir), is a tributary of the Salinas River. In San Luis Obispo County in the Upper Salinas Watershed, there are twelve major tributaries that feed into Nacimiento Lake in addition to the Nacimiento River: Kavanaungh Creek, Cantinas Creek, Asbury Creek, Gould Creek, Caballada Creek, Little Burnett Creek, Tobacco Creek, Town Creek, Franklin Creek, Las Tablas Creek, Dip Creek, and Snake Creek.

In the 1890's the Nacimiento River, above its confluence with the Salinas River, seems to have had more salmon than the Salinas River proper. Eli Wright was an early pioneer who lived up by Cantinas Creek in the 1880's and 1890's. He strung a fence across the river to collect fish and took enough steelhead to can and smoke every year, as well as some salmon (Franklin, 1999).

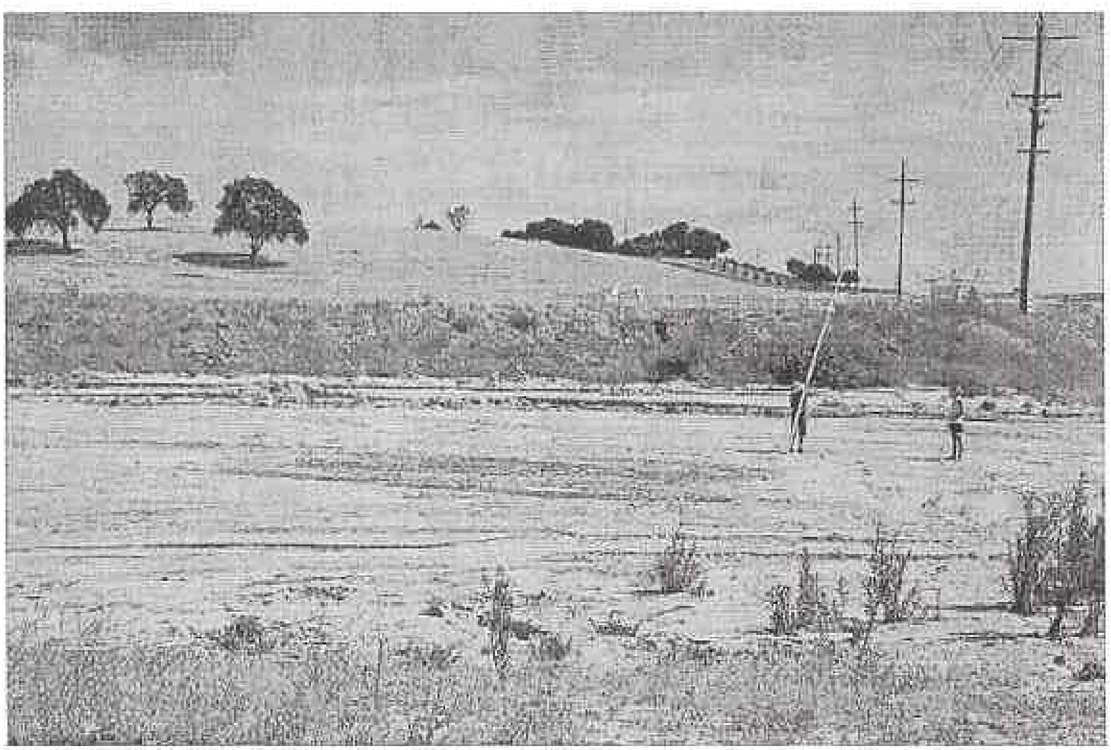
Duane Hall described how in the 1930's, he and his friend caught steelhead in Little Burnett Creek, Cantinas Creek, and Tobacco Creek. Mr. Hall stated that Tobacco Creek had plenty of nice steelhead. These fish were everywhere when water was plentiful; however, water no longer flows in this creek and the steelhead are gone. (Franklin, 1999). Franklin also reports, that in 1939 Mr. Don Keefer caught a dozen steelhead in the Nacimiento River, and in 1941 Abe Claassen caught a salmon in Las Tablas Creek.

In February 1941 there was a tremendous amount of rain. Mr. Ray Docc and Mr. Ray DeBois caught a Chinook salmon and steelhead in Las Tablas Creek. Two weeks later Jake Knuckles caught another Chinook salmon in this creek (Franklin, 1999).

In 1947 Fred Hecker, Captain of Patrol for the Division of Fish and Game reported steelhead going up the Nacimiento and San Antonio Rivers from the Salinas River (Mike Hill's Old files - CDFG). Steelhead runs up the Nacimiento River dwindled off rapidly within in a couple years of the completion of the Nacimiento Dam. When the lake overflowed due to spring rains, exotic species including bass and bluegill entered the Salinas River and ultimately found their way to Paso Robles and Jack Creeks. Within several years the exotic species depleted populations of small trout and steelhead (Franklin, 1999).

The building of the Nacimiento River Dam in 1956, and the San Antonio River Dam in 1958 reduced the steelhead run up the Salinas River above the mouth of the Arroyo Seco (in Monterey County). The Arroyo Seco River empties into the Salinas River near Greenfield. The Arroyo Seco River still has a steelhead migration and could very well be the source of a few steelhead that still come up the Salinas River (Franklin, 1999).

Nacimiento River looking downstream from the dam.
Steelhead no longer have access to the Nacimiento River west of the dam.



The Estrella River one mile east of the confluence with the Salinas River.
Riparian vegetation along the Estrella has disappeared.

B.2. Historical records of Steelhead in the Salinas River and tributaries in eastern San Luis Obispo County

The Salinas River has two major tributaries in eastern San Luis Obispo County: the Estrella River and the Huerhuero Creek. The Estrella River in turn has three tributaries: Indian Creek, Cholame Creek, and San Juan Creek. The Huerhuero Creek also has three tributaries, the East Branch, Middle Branch and West Branch.

In 1900, William and John Jardine checked the Huerhuero Creek during the spring runoff after a wet winter. They saw some steelhead in a pool, and caught them very easily. In the 1920's and 1930's, Mr. Elmer Anderson caught steelhead in one of the tributaries of Huerhuero creek. This tributary was perennial and steelhead may have spawned there in previous years. Steelhead rarely went up Huerhuero Creek - this was an unusual event in a wet winter (Franklin, 1999).

Mr. J. Inglekey caught salmon and steelhead during wet winters from the late 1920's to early 1930's. He caught a Chinook salmon in Gillis Canyon, about 8 miles east of Shandon up San Juan Creek, and steelhead at the confluence of Huerhuero Creek and the Salinas River. Chinook salmon runs were very heavy in the 1890's, but fell off sharply in about 1910, and by 1943 ended in the Salinas River (Franklin, 1999).

In 1930, Mr. Norman Bridge and his father caught steelhead at the confluence of the Estrella and Salinas Rivers, and at the junction of Huerhuero Creek with the Salinas River. Between 1933 and 1936 Mr. Bridge and his father saw only one steelhead in the Estrella River. His father who was born and raised in the vicinity, never mentioned seeing a run of steelhead in the Estrella River, even though there was plenty of water in springs all the way up past Shandon, a distance of approximately fifteen miles. Henry Twisselman in his book Don't Get Me Started tells about traveling from Cholame to San Miguel and catching steelhead in the Salinas River (Franklin, 1999).

During some years the Salinas River never flowed, or the flow was too small to push through the bar at the mouth on Monterey Bay. The Salinas River normally quit flowing about June to August, even before any dams were built or the country was settled. The first rains generally occurred in October, but the river usually didn't flow until the heavier rains came in December or January. In 1942 Mr. Cecil Smiley discovered that one of the best location to catch steelhead was the 13th Street Bridge across from the Paso Robles Water Works. Fishing was best during a cold winter in January or February (Franklin, 1999).

In 1955 Pelgen, Fisk & Paul of the California State Department of Fish and Game prepared a report regarding fish, wildlife, and recreation in the Salinas River Basin. In this report, steelhead angling was one of the sports suggested for the area although angling and recreational opportunities were limited (Mike Hill's Old files - CDFG).

B.3. Historical records of Steelhead in San Marcos Creek, Mustard Creek and their tributaries:

San Marcos Creek is a tributary of the Salinas River featuring seven tributaries and a small dam. Mustard Creek is also a tributary of the Salinas River, and has two unnamed tributaries.

There is little information about steelhead in San Marcos and Mustard Creeks. In the early 1920's Mr. Claude Booker caught steelhead in San Marcos Creek. Steelhead came up San Marcos Creek several miles south of San Miguel to year-round springs on the San Marcos tributaries (Franklin, 1999). However, information concerning historical presence of steelhead in Mustard Creek is unavailable. Sightings of steelhead in San Marcos and Mustard Creeks have not been reported in recent years.

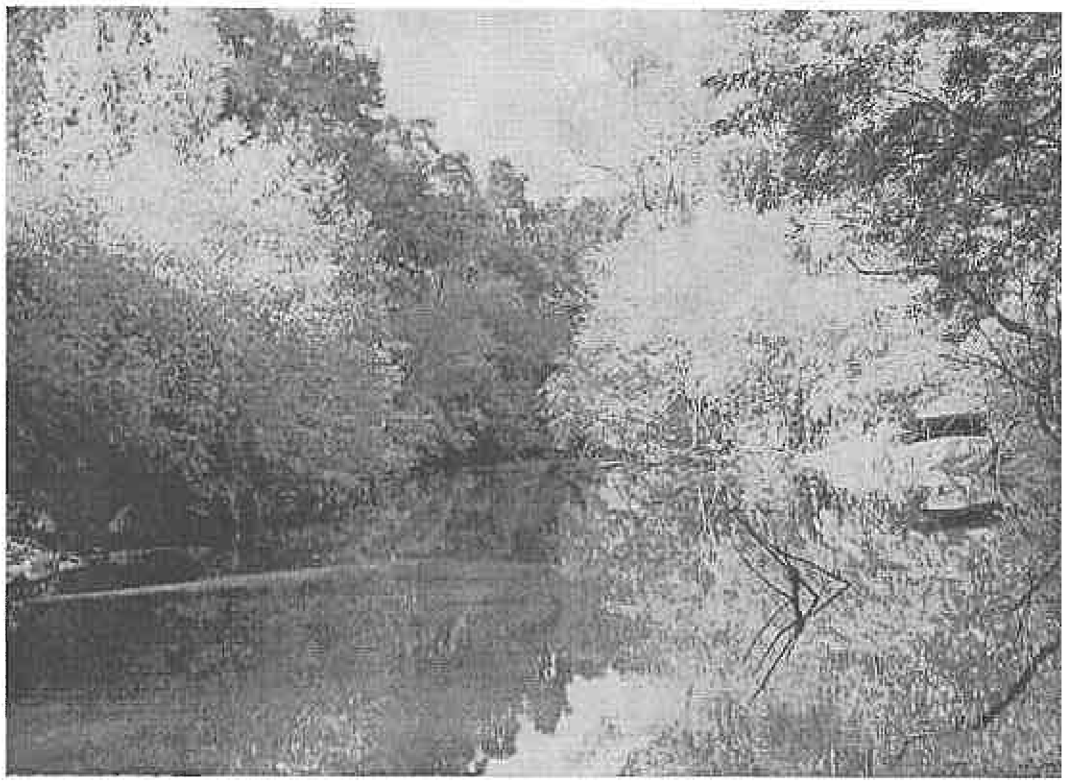
B.4. Historical records of Steelhead in Paso Robles Creek:

Paso Robles Creek is a tributary of the Salinas River and has three tributaries: Willow Creek, Jack Creek, and Santa Rita Creek. Willow Creek's tributary is Sheepcamp Creek and Jack Creek's tributary is Summmit Creek. Santa Rita Creek has three tributaries: Rocky Creek, Cienaga Creek, and South Fork of Santa Rita Creek.

Jim Hall mentioned that it would take about seven days for the steelhead to enter Paso Robles Creek from Monterey Bay, and two more days to reach their spawning areas up Jack Creek. After the Salinas River rose enough to clear the sand bar at its mouth, waiting fish could begin their journey up river. They would travel up the river day and night, pausing to rest along the banks where the swift running water gouged out holes with quiet eddies in which they could rest and recuperate (Franklin, 1999).

In 1937, Ernest Claassen found a great place to fish along Jack Creek. He fished from below Hidden Valley up to the junction with Santa Rita Creek. The fish came up beginning about the third week of January and stayed until the end of February, and if it was a wet year, he could fish until March. The fish were larger at the beginning of the run and were smaller toward the end of the run. In 1941 or 1942, Abe Claassen, Ernest's brother observed a large Salmon in Santa Rita Creek (Franklin, 1999).

In 1937 Edgar Wiebe said that Jack Creek was the best area around the country for fishing. As more houses were built and people moved into the area, it became riskier for fish. In the 1950's, Mel Hammons said that in Jack Creek at Hidden Valley there were fewer and fewer fish and more people, and from 1960's on they didn't see steelhead in the area (Franklin, 1999).



Paso Robles Creek west of Santa Rita Creek Road

Fish Barrier on Paso Robles Creek upstream confluence with Santa Rita Creek

In 1944, Eldon Bergman said that his father counted 22 steelhead in Jack Creek. The fish were either spawning on the riffles or resting in the holes, preparing to spawn. He said that a few steelhead probably still came up after the Nacimiento Dam was built because he saw steelhead in the Upper parts of Jack Creek in the 1960's and 1970's (Franklin, 1999).

The steelhead runs on Jack Creek typically began in January and ended in March, depending on the rains. Heavy late rains could bring steelhead upstream as late as May. Jack Creek, and Santa Rita Creek had the most steelhead before the 1950's (Franklin, 1999).

In May 1947, Patrol Captain Fred Hecker from the Division of Fish and Game reported that few steelhead migrated up to Paso Robles Creek and its tributaries, Santa Rita and Jack Creeks (Mike Hill's Old files - CDFG).

In May 1960, M.R. Schreiber from the California Department of Fish and Game surveyed Paso Robles and Santa Rita Creeks. He described spawning areas from the mouth of Paso Robles Creek to above its confluence with Santa Rita Creek. A large spawning area occurred from this location north to the Hwy 41 bridge. Above the Hwy 41 bridge, this spawning area decreased in size. Steelhead were noted in every pool observed during the course of the survey. However, the Nacimiento Dam stopped the steelhead run within two years of its construction in 1956, and even caused steelhead to vanish in Santa Rita Creek (Franklin, 1999).

In November 1973, Mike Seefeld and Jim Schuller from CDFG didn't find steelhead in Jack Creek. However, on June 18, 1975, the San Luis Obispo Telegram Tribune featured an article about two young anglers who caught a pair of steelhead in Jack Creek (Mike Hill's Old files - CDFG).

In addition, Mr. Franklin (1999) mentioned that Jack Creek was a very important spawning area for steelhead. He described how a pair of fish made a nest or redd about a foot deep, laid and fertilized their eggs then covered up with their swirling tails. The eggs incubated in the moving water and the fry hatched. The fingerlings migrated to holes that had water all summer, or if the holes dried up, they worked their way down into the gravel where it was wet.

Dave Highland, CDFG has reported seeing steelhead in Jack Creek recently. The steelhead in this area are probably a mixture of migratory steelhead and resident populations (Dave Highland personal communication).

In 1939, Mr. Wes Franklin and his brother caught steelhead in Willow Creek, and in the 1940's Mr. Eldon Bergman caught steelhead in Summit Creek (Franklin, 1999).

In the 1930's, Mr. Milton Dueck and his father caught steelhead at the head waters of Santa Rita Creek. Steelhead were plentiful those days in all of Santa Rita Creek's tributaries that had even a

San Luis Obispo
Telegram-Tribune
Wed. June 18, 1975

Kenneth Dutra, left, and Randy Best display their Jack Creek catches. (Photo by Warren Groshong)

Adelaida fisherman gets big steelhead

Jack Creek — a North County stream long-known to a few fishermen as good trout water — has produced lunker steelhead for a pair of young anglers.

Kenneth Dutra caught one of the sea-run trout, which apparently migrated to the Salinas River into tributary Jack Creek. It measured 28 inches from nose to forked tail and weighed out at just under nine pounds.

Dutra said he was fishing on a stretch of creek which runs through his family's ranch near Adelaida when he hooked the big fish on a "Balls of Fire" salmon egg.

A companion, Randy Best, proudly displayed a smaller fish taken from the same stretch of Jack Creek. It was 16 inches long.

1975 newspaper article about local fishermen with steelhead

trickle of water flowing in them. Santa Rita Creek flowed year-round due to numerous springs, and in the winter steelhead worked their way up into gullies above the springs that dried out during the summer (Franklin, 1999).

In 1955 Mr. Hartsell built a 35-foot high dam across Santa Rita Creek below Rocky Creek's mouth forming a big lake that covered 100 acres or so. The dam stopped steelhead from getting up into their main spawning grounds. For a few years steelhead came up to the dam's base however, steelhead are not found in Santa Rita Creek today (Franklin, 1999).

In November 1973, Judy Tartaglia of Department of Fish and Game mentioned in her Santa Rita Creek report that the deterioration of the Salinas River due to major dam construction had eliminated steelhead from upper spawning areas in the Salinas Watershed such as Santa Rita Creek (Mike Hill's Old files - CDFG).

B.5. Historical records of Steelhead in Graves Creek:

Graves Creek joins the Salinas River, approximately one-quarter mile south of the mouth of Paso Robles Creek.

The steelhead runs on Graves Creek started in January and ended in March, and depending on the rains could bring steelhead upstream through May. Before the 1950's Graves Creek was considered one of the creeks with the greatest abundance of steelhead (Franklin, 1999).

On May 19, 1999, a steelhead survey in Graves Creek was conducted by Jennifer Nelson, Chuck Marshal and Dave Highland of the California Department of Fish and Game, Jim Patterson of the Atascadero Water Mutual Company, and Jody Olson, an Independent Biologist. In this survey five locations were evaluated, but steelhead were not found (Nelson, *et.al.*, 1999b).

B.6. Historical records of Steelhead in Toad Creek:

Toad Creek is a tributary of the Salinas River with two tributaries, Little Toad Creek and Big Toad Creek. Toad Creek is located just 1.5 miles north of the Upper Salinas-Las Tablas RCD office in Templeton.

Mr. Ray Nelson mentioned that in the 1920's steelhead were caught in Little Toad Creek as well as in Big Toad Creek which flows through Templeton (Franklin, 1999). Steelhead have not been reported in Toad Creek in recent years.

B.7. Historical records of Steelhead in the Salinas River at Atascadero and in Atascadero Creek:

Atascadero Creek is a tributary of the Salinas River flowing eastward, parallel to Highway 41. This creek has two main tributaries, Eagle Creek and Hale Creek. Atascadero Creek is an intermittent stream and unfortunately is not very healthy in the urban areas. Problems such as trespassing, illegal dumping, ORV's, urban pollution, lack of riparian vegetation, and other factors have degraded the habitat available for steelhead migration and reproduction.

In the winter of 1942-1943, Mr. Franks and his brother caught steelhead and three Chinook salmon behind the Atascadero State Hospital, located south of Atascadero. In 1944, Harold and Wess Franklin caught steelhead where Highway 41 first crosses Atascadero Creek at Old Morro Road; they just jumped in and grabbed the steelhead with their hands. Wess Franklin and Art Buchanan also fished up Atascadero Creek to its head waters on the Eagle Ranch where a waterfall tumbles over a ledge 10 or 12 feet high into a pool. That fall is the farthest point upstream to which a migrating steelhead can travel and that is where they caught steelhead. Jim Hall mentioned that before the 1950's, Atascadero Creek had a lot of steelhead (Franklin, 1999).

In February 1981, The U.S. Fish and Wild Service wrote a report on the U.S. Army Corps of Engineers' proposal to build a Small Flood Control Project for the Salinas River at Atascadero. In their considerations, they mentioned that approximately 500 steelhead run in this area. The steelhead adults entered the river as early as November, and were observed as far upstream as the Salinas Dam. Fishing activity in this area was minimal. Mr. Franklin's son saw two steelhead in the Salinas River below the Paloma Road culverts south of Atascadero in March, 1998 (Mike Hill's Old files - CDFG; Franklin, 1999).

On May 18 and 19, 1999, a steelhead survey in Atascadero Creek was conducted by Jennifer Nelson, Chuck Marshal and Dave Highland of the California Department of Fish and Game; Donald J. Funk of the Upper Salinas - Las Tablas RCD; Jim Patterson of the Atascadero Water Mutual Company; and Jody Olson, Independent Biologist (Nelson, *et.al.,* 1999a).

In this survey eight locations were evaluated and six had steelhead present Kathleen Valley small upstream of McLean Spring, and in Hale Creek in a slide area. A pool on Atascadero Creek upstream of Hale Creek had steelhead with different classes of age. Plum Orchard and Atascadero Creek at Three Bridges, upstream of the middle bridge, had steelhead young of year and yearling steelhead. Steelhead were also found in a pool in Atascadero Creek at Three Bridges (Sycamore Road Bridge).

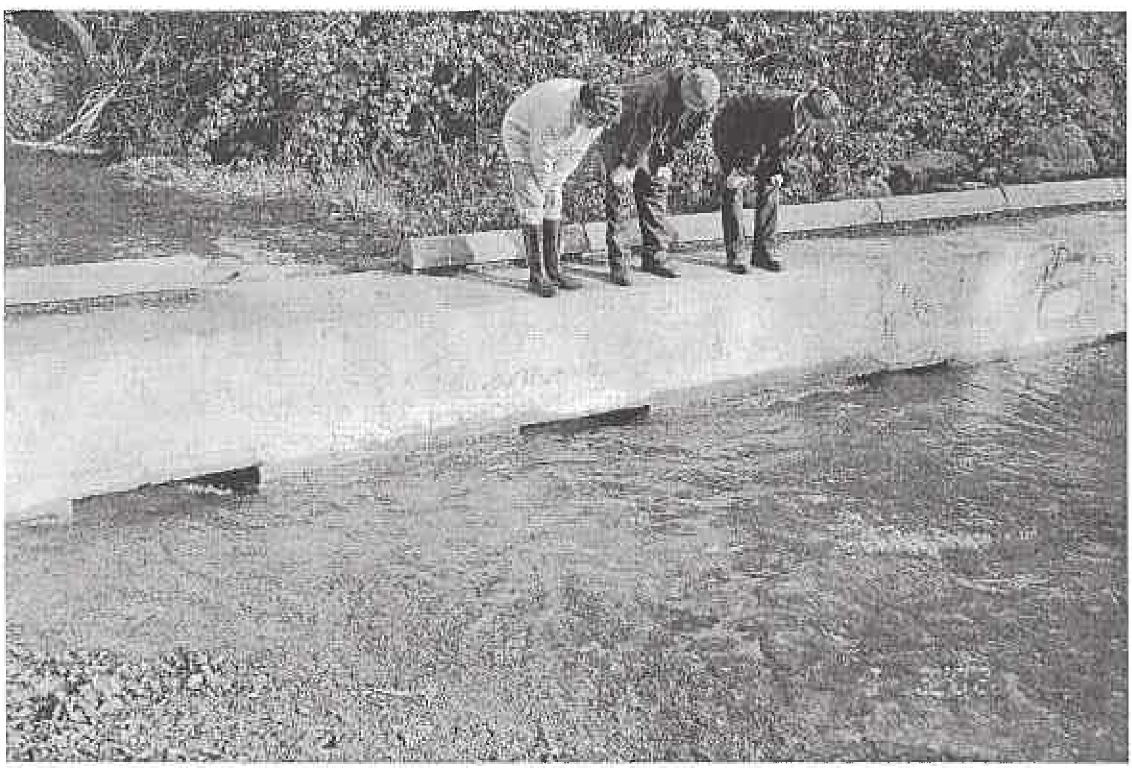
On December 14 and 15, 1999, another Atascadero Creek steelhead Survey was conducted by

Jennifer Nelson, Dave Highland, Erika Cleugh, and Jim Stainbrooks of the California Department of Fish and Game, Donald J. Funk from Upper Salinas - Las Tablas RCD, Jim Patterson of the Atascadero Water Mutual Company, and Jody Olson, Independent Biologist. This survey involved Hale Creek which is perennial from the dam down to the confluence with Atascadero creek. Nineteen locations were evaluated in this survey, and 16 had steelhead in different age classes (Nelson, *et.al.*, 1999c).

On April 7, 2000, Jennifer Nelson presented a report about these 1999 surveys. In the summary she mentioned that the perennial waters in Hale and Eagle Creeks provided a combination of spawning and rearing habitat, instream shelter and adequate food supply. Low summer/fall stream flow, however, decreased steelhead populations in these creeks (Nelson, 2000).

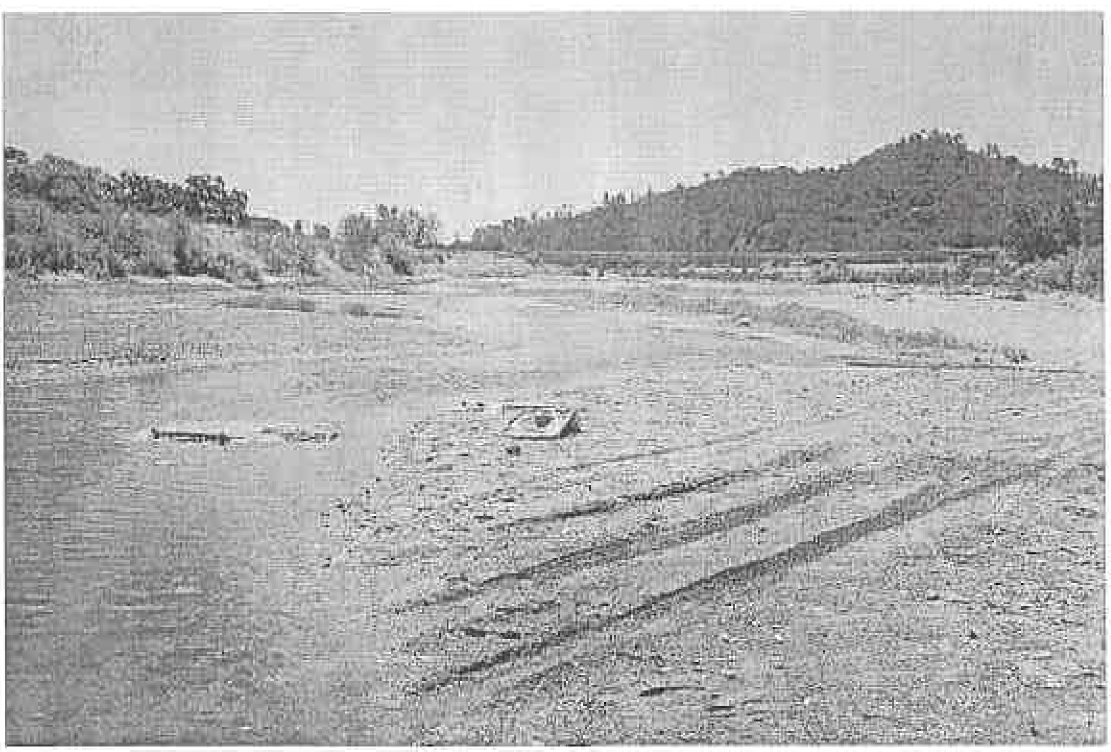
There are several explanations for the low steelhead densities found in the lower reaches. One possible explanation is that adults are not successfully migrating up the Salinas River to Atascadero Creek to spawn, perhaps due to low flows which do not permit migration. If the flow is optimum for short periods of time, the adults may stranded lower in the Salinas River. It is also possible that successful migration, spawning and rearing occurred in the past, but when the smolt began to migrate down the Salinas River in the spring, they became stranded as the flows in the river dropped. If the smolts die before they get to the ocean, there will not be any adults to return.

Atascadero Creek at 3 bridges area



Fish Barrier on Atascadero Creek at Curbaril Road sewer line crossing

Vehicle destruction of vegetation and alteration of natural channel flow in the Salinas River near Templeton



Trash and damage from OHV use in Salinas River at Atascadero Creek

B.8. Historical records of Steelhead in Santa Margarita Creek and Salinas River at the head waters:

Santa Margarita Creek has three tributaries: Trout Creek, Yerbabuena Creek and Tassajara Creek. Below the Salinas Dam, the headwaters of the Salinas River has three tributaries: Moreno Creek, Pilitas Creek and Rinconada Creek with its tributary, Burrito Creek. Santa Margarita Lake or Salinas Dam was constructed on the Salinas River in 1940. Santa Margarita Lake has three tributaries flowing into it: Salsipuedes Creek, Toro Creek with his tributary, Yara Creek, and Alamo Creek.

Above the dam, the head waters of the Salinas River has a tributary, Pozo Creek, that in turn has its own tributary, Trujillo Creek. The Salinas River has five more unnamed tributaries in this segment.

In May 1947, Patrol Captain Fred Hecker of the Division of Fish and Game, reported a small number of steelhead in Santa Margarita and Trout Creeks. Captain Hecker also wrote a report about the Salinas Reservoir San Luis Obispo County. He noticed that before the dam was built in 1940 a few steelhead went up the Salinas River as far as Pozo and an occasional fish was seen as far up as the U.S. Forest Service Avenales Guard Station during winters of exceptionally heavy rainfall (Mike Hill's Old files - CDFG).

Mr. Hecker pointed out that flow in the river was now regulated at the dam, reducing the steelhead run at this point because the river no longer reached flood stage. The demise of the steelhead run began when the Salinas Dam was built in 1940 at Santa Margarita Lake, reducing the flow of water in the Salinas. Jim Hall mentioned that before before the 1950's, Tassajara Creek had a lot of steelhead and some steelhead migrated up the Salinas River to the Pozo area (Franklin, 1999).

In September 1975 , W. Snider with the Department of Fish and Game reported that Tassajara Creek provided some of the more suitable steelhead habitat within the drainage. The protection and preservation of the habitat provided in Tassajara Creek was important for the preservation of the Salinas River's steelhead fishery although residential construction and grading along this creek resulted in siltation and sedimentation of Tassajara Creek (Mike Hill's Old files - CDFG).

In 1999, residents around the Santa Margarita Creek area reported the presence of large steelhead to Dave Highland, CDFG. They were probably migratory steelhead because Santa Margarita Creek's flow cannot support a resident population with larger sizes (Dave Highland - CDFG, comm. pers).

CHAPTER III
Channel Conditions

CHAPTER III CHANNEL CONDITIONS

A. Channel Study Methodology

Over the past 18 months, the Upper Salinas-Las Tablas RCD staff, with assistance from the California Conservation Corps, has conducted water quality surveys, suspended sediment studies, vegetation evaluations and morphological surveys of steelhead streams located within the Upper Salinas River Watershed. The primary work has involved the study of Atascadero Creek and the Salinas River. This work is still in progress and the results and conclusions contained in this report are based solely on the portions of the stream network that has been surveyed and from the general observations of those portions which are yet to be surveyed.

The study has evaluated the elements of the streams that affect the health of steelhead. Since steelhead still inhabit several streams in the region, the results of the study have been used to create a list of recommended actions that can improve the conditions for steelhead.

FACTORS AFFECTING STEELHEAD:

- Water quality
- Water quantity
- Water temperature
- Good pool-riffle channel characteristics
- Nonembedded cobbles and gravels in spawning areas
- Accessibility for the fish throughout the river system
- Riparian canopy and shading of streams

USGS QUAD maps, USDA aerial photos and other maps and aerials were used to evaluate the stream conditions. A planimeter was used to determine watershed areas. A map wheel was used to measure the length of stream channels on maps and aerial photos. Data from FEMA, State Fish and Game and other sources was researched.

The survey work included the placement of a number of "control" bench marks throughout the watershed. These bench marks permit the periodic review of the changes in the channel configurations, indicating more precisely the amount of bank and bed erosion that is occurring in the upper portions of the watershed and how much aggradation is occurring in the lower portions nearest the bay. GIS assistance has also been provided by the CCC and will be used in future surveys of the region. The field survey information is recorded manually in a typical form, with information regarding the physical characteristics of the creek and surrounding channel and terraces. This data is later inputted into a computer spreadsheet data base and graphed for evaluation and presentation. This information has been cross-referenced with the vegetation data and biological study.

Primary Field Equipment:

Surveyors levels and tripods	Stadia rods
100 and 200 foot fiberglass tape measures	#4 rebar and pipe used for bench marks
LaMotte Turbidity Kit	Sentry I Dissolved Oxygen Meter
pHydrion pH dip sticks	Thermometer calibrated in degrees centigrade
The Science Source Water Sampler	Imhoff Sediment Cone and Stand
60 centimeter turbidity tube w/ secchi disk	Flow Probe Hand-held Flowmeter
Spherical Densiometer	Pencils and "Write in the Rain" Log Books
Hip wadders	Camera

This channel study focuses on the Salinas River and Atascadero Creek. Portions of stream channels within the Upper Salinas River Watershed have been surveyed in detail . We also conducted visual and photo surveys of other portions of the watershed and used black and white, color and infrared aerial photographs. The work has been conducted in the alluvial valley areas and at the entrance to canyons.

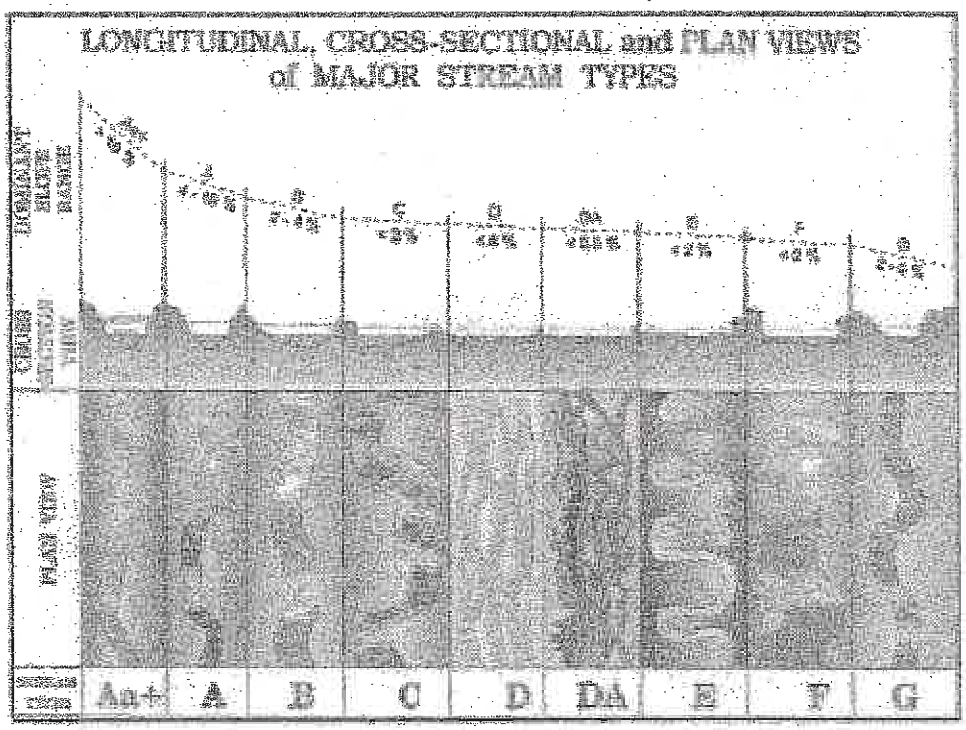
The cross-sectional figures and longitudinal diagrams contained in the appendix exhibit the conditions that are described in this report. Since there are no known previous morphological surveys of these creeks, our conclusions are necessarily based upon careful observations of the creek surroundings and discussions with persons who had witnessed previous creek conditions.

Other indicators are often useful in evaluating stream channel changes. For example, in some locations we observed old creek beds located many feet horizontally and several feet higher than the current creek thalweg, indicating the degree of degradation and outside bank erosion. Often, the previous creek bed was still evident by the observation of cobbles and gravels observed in eroded banks. Sometimes, structures such as culverts and bridges helped to identify creek channel changes. We surveyed the elevations of these "indicators" to assist in our evaluation of the channel morphology. Those interviewed regarding historical conditions included: Harold Franklin, retired school teacher, fisherman and long time local resident; Mike Hill and Jennifer Nelson, Department of Fish and Game biologists, and Dave Highland, Fish Habitat Specialist, California department of Fish and Game.

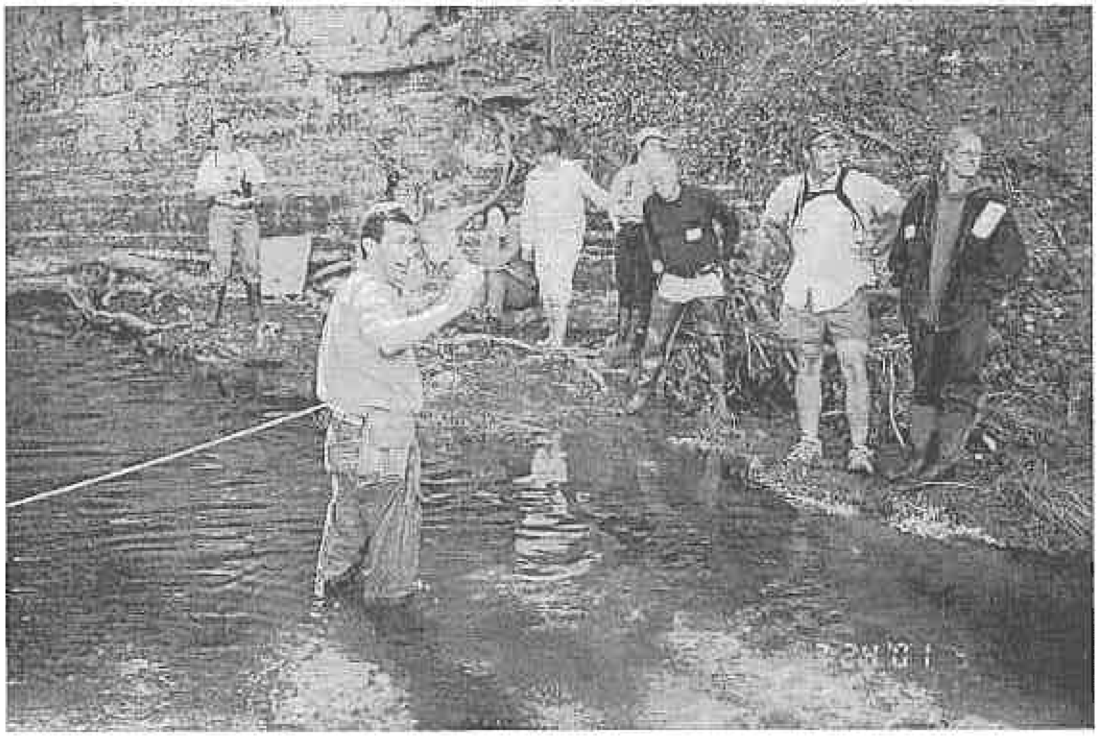
The streams are evaluated using the State Fish and Game, Salmonid Stream Habitat Restoration Manual classification system. This system of channel classification, first devised by David Rosgen and published in the geomorphological journal, Catena in 1994, is now accepted and used by State Fish and Game, the US Forest Service and many other public agencies. The classification system categorizes channels based upon a number of factors, including:

- Channel slope
- Channel sinuosity
- Stream bed materials
- Entrenchment ratios
- Braided vs. non-braided conditions
- Bankfull width-depth ratios

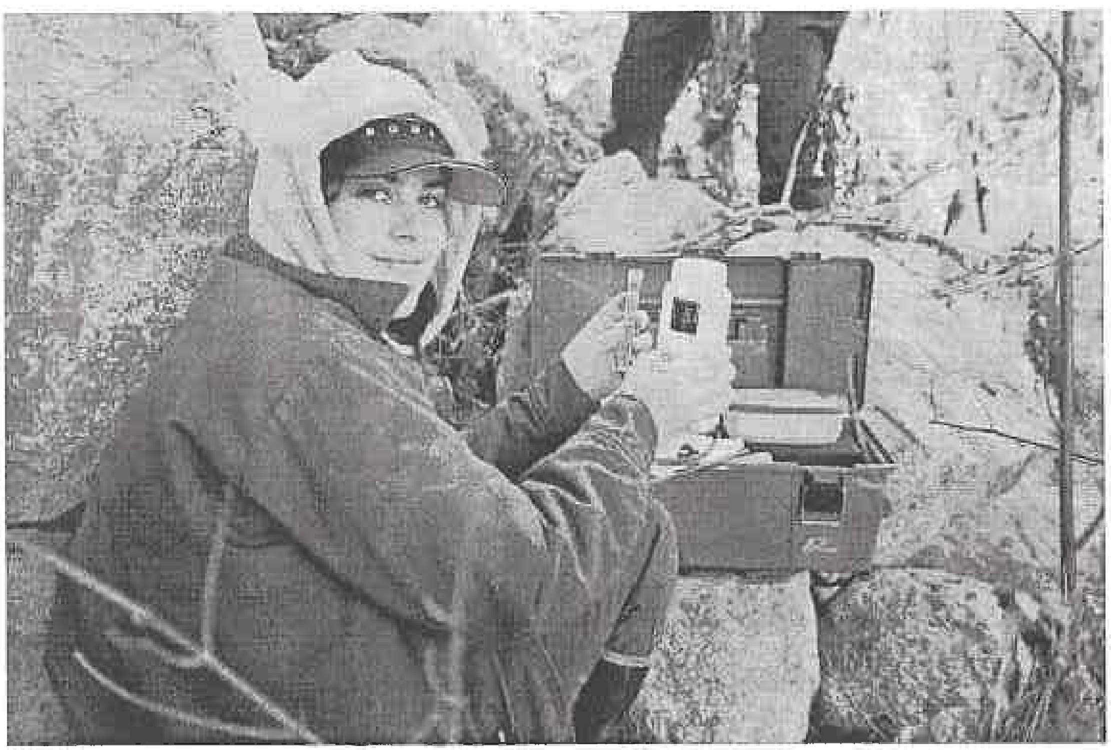
The following diagram indicates the stream types which were used to evaluate the conditions of channel and habitat in the Upper Salinas River Watershed:



Stream Channel Classification Diagram
Department of Fish & Game & Dave Rosgen



Water quality survey training at Atascadero Creek near High School



Conducting water quality survey on Atascadero Creek

B. Observed Conditions and Conclusions

Some of the reaches surveyed in the Upper Salinas Watershed indicate characteristics that are favorable for steelhead. These reaches generally have dense bank vegetation and significant canopy as well as numerous riffles and pools that provide habitat for steelhead.

Other reaches have conditions that are not as favorable for steelhead. These reaches generally are entrenched streams deeply incised in relatively gentle terrain. The width to depth ratios of these reaches are high, most exceeding 12 to 1. Some reaches have either been relocated and "straightened" to allow for construction of roads, freeways and other development. Other reaches have been "enchannelled" by levees. Dams and other diversions and barriers affect several channels. The result has been a loss of vegetation as well as severe bed degradation and bank erosion. Not surprisingly, this is a likely source of sediment impacting the Salinas channel in Monterey County.

- Atascadero Creek near 3 Bridges, west of Atascadero: This reach is located 25,000 to 25,326 feet southwest of the confluence of Atascadero Creek and the Salinas River. At this location, Atascadero Creek exits a narrow canyon and enters a broad alluvial valley. Part of the terrace appears to have been filled to construct Highway 41. The stream has been perennial during the years 1998 through 2000. The year 2001 was drier than normal. During the fall of 2001, the stream became intermittent at the bridge and only flowed perennially upstream of the bridge.

  The area east of the western-most bridge is comprised of stable C-3 and C-5 Channel Types. The channel bed is predominantly sand near the bridge. Short reaches downstream of the bridge have gravel and cobble beds. Much of the channel in this area is characterized by berry vines and willows. Bank vegetation coverage is above 90 percent, except at the bridge, which has a base of both concrete and rock gabions. The channel in close proximity to the bridge appears to have been modified by grading and bridge construction and is an entrenched F-5 channel. Downstream of the bridge, the channel types are stable C-3 and C-5, characterized by a series of pools and riffles. For the first 200 feet upstream of the bridge, the channel slope is 0.5 percent. This reach is a stable C-5 channel with a large pool over 2 feet in depth. (Refer to Sectional Diagrams at the end of this report)

  For the next 125 feet upstream, the slope increases to 3 percent. This reach is a stable B-2 channel, characterized by small boulders with numerous step-pools. At the cross-section located along the north side of the bridge, 25,000 feet from the confluence, the entrenchment ratio is 1.42 to 1. This ratio is higher than the typical entrenchment for this reach due to the filling of the channel conducted during construction of the highway bridge. At the 25,300 foot cross-section, the entrenchment ratio is 1.85 to 1 and the channel appears to be relatively stable.

Recent electrofish studies of this reach have resulted in positive findings for steelhead (J. Nelson, Dept. of Fish and Game). The cobbles and gravels in riffles are not embedded, pools are relatively deep (some over 2 feet deep) and the water has good dissolved oxygen (DO) and clarity. DO levels have been consistently above 5.0 with levels usually in the range of 6 to 9 and turbidity is less than 5 Jackson Turbidity Units (JTU), even during moderate rainstorms.

The canopy is 50 percent near the bridge and 75 percent upstream of the bridge. The canopy in the upper edges of these locations is not only created by vegetation, but by the bridges as well. In the early fall of 2001, the canopy vegetation was evaluated by densiometer. On the south edge of the third bridge, the canopy vegetation can be considered poor with 47.0% total cover. The percentage of bare soil was between 0-10% and the percentage of vegetation ground coverage was more than 76%, but 40% of this is concrete.

One possible constraint for steelhead is a potential barrier located approximately 2 miles downstream at the Curbaril sewer line crossing. That concrete structure has the potential to easily clog with sediment and become a deterrent to fish passage.

- Atascadero Creek near West Mall Bridge (Old Highway 41): The distance of this reach from the confluence with the Salinas River is 4,685 to 5,450 feet. The bridge is located at 4,950 feet. The location of this reach starts northeast of the West Mall bridge and extends upstream approximately 500 feet southwest of the bridge.

The channel has cut through a broad, gently sloping alluvial plain. The terrace has a slope of less than 0.5 percent. During the course of this study, stream flow has been perennial at this reach. Flows during the fall become very small, sometimes decreasing to less than 1 cubic foot per second.

This reach of the channel has probably gone through a transition from a stable C-3 and C-5 channel to the current unstable F-3, F-5 and F-6. Channel beds are sand downstream of the bridge. The bed is cobble for approximately 100 feet (a short riffle). Upstream, the channel is a combination of silt and sand. Recent deposits appear to contain significant quantities of silt.

There are several areas of serious bank erosion, most noticeably at meander turns. Berry vines and willows stabilize some banks. However, the eroding sections have little or no vegetation and banks are close to vertical. The slope of this reach (about 750 feet in length) is 0.5 percent. The terrace is 22 feet above the thalweg. This is 15 feet higher than twice bankfull elevation. Even a 100 year flood is constrained within the narrow walls of this quickly eroding channel. The right bank has 90 percent vegetation coverage while the left bank has 0 percent coverage at this cross-section. In the early fall of 2001, the canopy vegetation was evaluated by densiometer. At the West Mall site, just downstream of the bridge, the canopy vegetation can be considered optimal with 98.5% of total cover, the percentage of bare soil was between 0-10% and the percentage of vegetation ground coverage was between 51-75%. (Refer to the Atascadero Creek Sectional Diagrams at the end of this report)

In addition to the eroding banks, the channel bottom is degrading. The channel thalweg has eroded vertically almost 4 feet within the past 21 years, an average of .2 feet per year. At cross-section 4,950, the entrenchment ratio is 1.42 to 1. This site, located on the southwest side of the bridge, has been armored with 2 foot riprap boulders.

At the 5,300 cross-section, the entrenchment ratio is 1.15 to 1. This area of the channel is extremely entrenched and unstable. The entrenched channel causes high stream velocities. The Army Corps estimated velocities of 10.6 feet per second during a 100-year storm and flows of 6,625 cubic feet per second. The left channel bank has eroded horizontally 3.1 feet during the past 12 months. A very large oak tree is being threatened; its roots have been undermined by the erosion. A pool across from the oak tree has filled with sediment during the last year. If the bank is not stabilized soon, the weight of the oak tree will overwhelm the strength of the vertical bank and the tree will collapse into the channel, taking with it an estimated 30 feet of terrace soil.

During the winter of 2001, the Atascadero Unified School District constructed a riprap structure downstream of the oak tree. That section of bank had eroded toward the school district offices. They recently drilled a well and constructed a small water storage tank on the terrace near the riprap structure.

No recent electrofish studies have been conducted at this reach. Cobbles and gravels are somewhat embedded and riffles have a high percentage of sands, probably due to constant nearby bank erosion. Canopy is estimated at 25 percent. Water quality is generally good, although there is considerable higher turbidity during storms than at the 3 Bridges site, approximately 4 miles upstream. DO levels are consistently above 5.0 with levels usually in the range of 6 to 8. If excessive sediment can be controlled by reducing bank erosion and improving drainage runoff from the urban area, conditions for steelhead would improve.

- <u>Atascadero Creek at the confluence with the Salinas River:</u> This reach is 1,700 feet in length, beginning at the Salinas River extending upstream to about 100 feet above the Sycamore Street bridge. At the confluence, the Atascadero Creek drainage area is 19.7 square miles. The channel has been subject to substantial modification. The historical confluence was about 1,400 feet upstream of the current confluence. The right terrace is relatively recent, being constructed about 30 years ago. The Salinas River was moved easterly and a tall levee constructed along the left bank of the river to prevent erosion of the new terrace. Most of the riparian vegetation that existed along Atascadero Creek and the

Salinas River in 1949 aerial photos has disappeared.

During the course of this study, stream flow is perennial upstream of 1,400 feet and intermittent from 1,400 feet to the confluence with the Salinas River. Water quality is similar to that at the West Mall Bridge. As the water flows decrease during the fall, the stream becomes increasingly stagnant and musty odors are noticeable. This stagnant condition is more apparent downstream of the bridge during the lowest flows.

Army Corps surveys of the channel in 1981 indicate that there was a sudden drop of about 2 feet in height approximately 300 feet downstream of the Sycamore Street bridge. That drop has moved upstream to the southwest side of the Sycamore Street bridge. The average slope of the reach below the Sycamore Street bridge is 0.3 percent. At the southerly edge of the bridge, there is a two foot tall concrete grade control structure, originally constructed to protect a pipeline. During the storms of 2001, the grade control structure partially failed. Erosion of the channel behind that structure has begun to occur.

Several years ago, a rock riprap structure was constructed along the right bank at the middle of a long outside meander curve of Atascadero Creek. Three years ago, the Atascadero Mutual Water Company conducted an extensive bank restoration project which included a regrading of eroding banks to a 2 to 1 slope and planting of those new banks with a combination of upland and riparian vegetation. The Water Company also removed several low berms along the channel, opening up terrace areas to beneficial flooding.

The channel contains a series of shallow pools, ranging from 1 to 2 feet in depth. The channel is highly entrenched. The entrenchment ratio at the 500 foot cross-section is 1.23 to 1. At the Sinuosity is low, with at ratio of 1.12 to 1. This reach of Atascadero Creek is channel type F-2. (Refer to the Atascadero Creek Sectional Diagrams at the end of this report)

As mentioned above, the 1949 aerial photos indicate considerable channel vegetation. Most of that vegetation disappeared by 1978. Bank coverage prior to the Water Company's restoration project in 2000 was 0 percent on the left bank and 25 percent on the right bank at the 500 foot cross-section. After the restoration, the bank coverage has improved to 75 percent on both the left and right banks. Most of that vegetation is grasses. Overcoverage is 0 percent. The reestablishment of riparian vegetation may initially require supplemental irrigation.

Vehicle use in both Atascadero Creek and the Salinas River is quite evident at this reach. Tire tracks and vehicle debris is prevalent, even during stream flow. Frequent OHV recreational use of the stream and river has been observed. Compaction of the channel sands and gravels as well as the destruction of young riparian vegetation is an obvious result.

Atascadero Creek at the West Mall bridge (old Highway 41)

**In-Channel Erosion caused by loss of vegetation and channel entrenchment.
Location: Atascadero Creek 350 feet upstream of West Mall bridge.**

Stable Step-Pool B-2 type stream channel at Atascadero Creek east of 3 Bridges

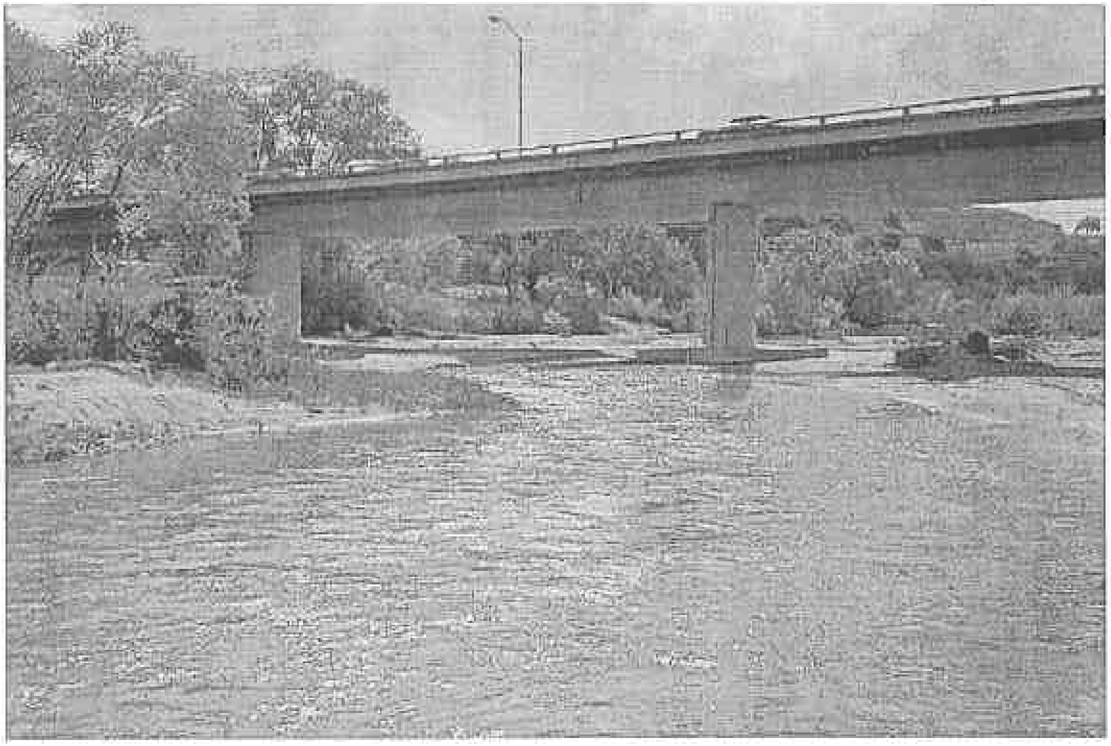
Stable C-3 type channel, Atascadero Creek near 3 bridges

- Salinas River at the 13th Street Bridge, Paso Robles: This cross-section was surveyed along the northerly edge of the 13th Street bridge. The channel is approximately 500 feet wide from edge of the west terrace to the edge of the east terrace. The drainage area is 390 square miles. In 2000, the stream flow was intermittent, with the channel flowing on the surface until mid summer. In 2001, the stream flow was also intermittent, but surface flow continued until late fall. Surface flow is generally very small after the end of spring, with one or more narrow stream flows meandering down the middle of the wide sandy bottom. Flows can vary dramatically, with storms resulting in flows over 28,000 cubic feet per second (Years 1969 and 1995 per USGS Gaging Station Data, Station No. 11148500). During storms in 1969, the river almost reached the underside of the 13th Street Bridge, a depth of almost 27 feet. (Refer to the Salinas River Cross-Section at the end of this report)

  This is a site where historically there were steelhead trout and it has been described as a formerly good fishing hole. Today, conditions are not good for steelhead. The channel is highly entrenched. The entrenchment ratio is only 1.13 to 1. Channel slope is less than 1 percent. Aerial photos of the site in 1949 indicated that the channel bed had significant riparian vegetation. Much of the historical vegetation is gone from the channel. Channel banks have moderate vegetation cover. As with the site at the confluence with Atascadero Creek, there is obvious OHV recreational use of the Salinas River channel in Paso Robles. Vehicle tracks have been observed across the majority of the channel bottom both upstream and downstream of the 13th Street bridge. Vehicle tracks are evident during much of the year. Off road trespass vehicle use has occurred for a number of years. Trash accumulates within the channel.

  The vegetative cover on the right bank is 60 percent at the cross-section. The vegetative cover on the left bank is 30 percent. Based upon analysis of 1949 aerial photos, the historic vegetative bank cover was close to 100 percent at this location. Most of the original riparian vegetation has disappeared. Vegetative overcoverage (shading) is now less than 10 percent.

  The bed is comprised mostly of sand, with a small proportion of gravels and cobbles. The Salinas River at this location is an unstable F-5 type channel.



Salinas River at 13th Street Bridge, Paso Robles

Estrella River at the North River Road crossing near the confluence with the Salinas River

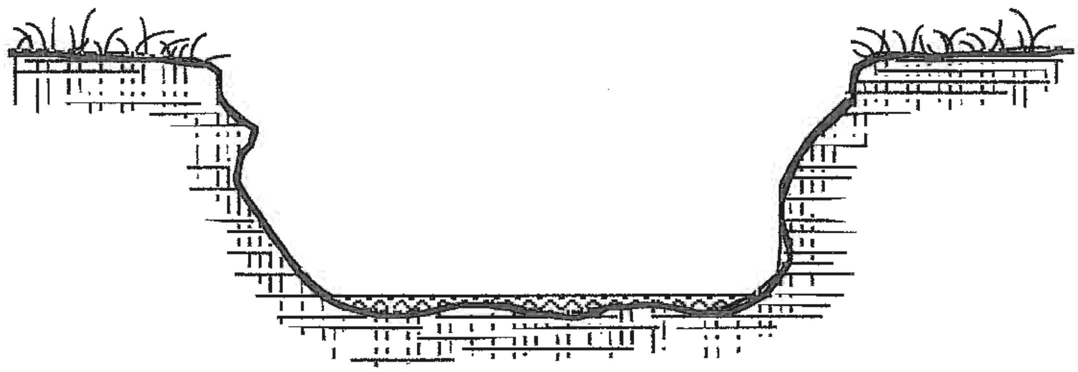
- Estrella River Near the confluence with the Salinas River: The Estrella River is the largest tributary system of the Salinas River. The location of this survey is approximately 6,000 feet southeast of the confluence with the Salinas River, at the crossing of North River Road. The total drainage area of the Estrella watershed is 948 square miles, approximately double the drainage area of the Salinas River at the point of confluence with the Estrella.

  Much of the Estrella River watershed is arid with rainfall averaging less than 10 inches per year over the majority of the drainage. While average rainfall is low, major rainstorms occur every few years, sometimes causing flooding of adjacent terrace areas. For example, in 1969, the Salinas River Gaging Station in Paso Robles recorded a peak flow of 28,000 cfs. In that same year, a peak flow of 32,500 cfs was recorded at the Estrella River Gaging Station near the community of Estrella. In 1978, a peak flow of 14,500 cfs was recorded in Paso Robles on the Salinas River while the Estrella River had a peak of 31,900 cfs. But rainfall in the Upper Salinas Watershed seldom follows consistent patterns. For example, in 1995, when the Salinas had a peak of 28,400 cfs, the Estrella experienced a peak of only 15,900 cfs.

  Like the Salinas River, the Estrella has experienced major changes in vegetative cover over the past 50 years. Based upon 1949 aerial photos, the Estrella River had dense vegetation lining both the right and left banks at the River Road cross-section. The Estrella had significant vegetation cover downstream and upstream of North River Road. Today, much of that vegetation is gone, with only an occasional willow. Portions of the historical channel downstream of North River Road have been converted to agricultural uses. Unlike the Salinas, San Antonio and Nacimiento Rivers, the Estrella was not known as a major steelhead stream. As with other east valley streams, in the past, there may have been occasional steelhead in the Estrella. Today, the Estrella River has no known remaining steelhead. It's major influence on steelhead habitat is its impact on sediment production. The lower reaches of the Salinas River have excessive sediment. During storm flows, the Estrella has significant levels of suspended sediment. Concentrations of suspended sediment are much higher in the Estrella than in the main channel of the Salinas River.

  The Estrella River channel is experiencing numerous areas of serious bank erosion. Some of this erosion is due to the loss of channel riparian vegetation. Suspended sediment in the Estrella is very high. During large rainstorms, sediment levels of over 90 cubic centimeters per 1000 milliliters have been recorded. The Estrella may be a major cause of excessive sediment in the Salinas River. (Refer to the Estrella Cross-Section at the end of this report)

"F" Type Channel Characteristics



Landforms This type of unstable channel was observed at the 13th Street survey location of the Salinas River.

Bed Materials The majority of channel materials observed in the surveyed reach are made up of sands (F5), gravels (F4) and some cobbles (F3).

Slope (Range)	0 to 2 percent	**Entrenchment Ratio**	Less than 1.4:1
Width/Depth Ratio	More than 12:1	**Sinuosity**	More than 1.4:1

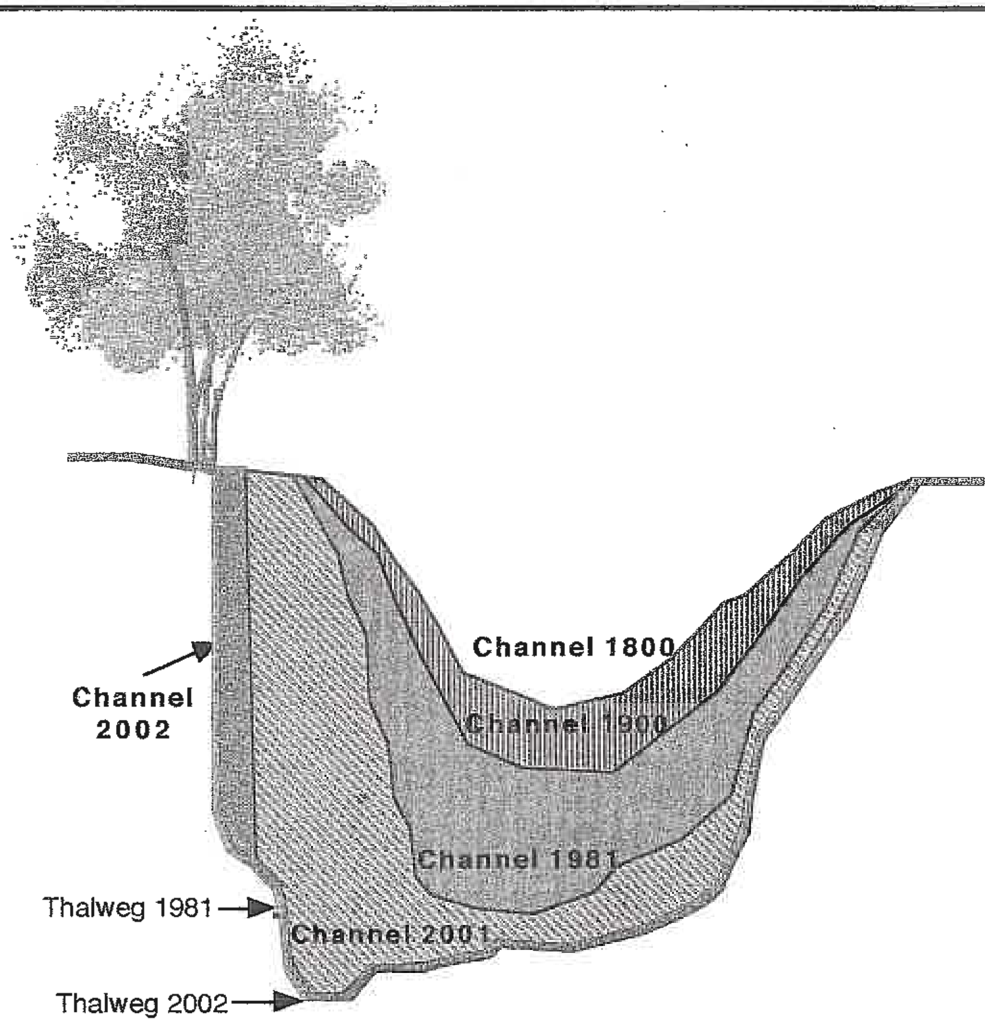
Unstable "F" Type Channel Typical of Areas of Salinas River Surveyed

C. Historical Changes in Channels, Vegetation and Stream Flow

Some of the channels surveyed appear to be severely degrading, that is, the channel bottoms are rapidly becoming lower. This is evident on the lower reaches of Atascadero Creek and along the Salinas River in Paso Robles. The following diagram indicates the probable stream channel sections on Atascadero Creek at 5,300 feet from the confluence. The projections of these sections are based upon field survey data and criteria of bankfull and twice-bankfull flows. Flood waters at twice-bankfull levels generally escaped the deeper portions of the channels, allowing the extreme forces associated with flood flows to be spread over a wide plain. This spreading action permits the flood water velocities to slow significantly and limit their erosive action. In addition to increased erosion, entrenched channels in the Salinas Watershed also have other negative consequences. When channels become entrenched, downstream flooding becomes more frequent, since the flood waters reach the lower reaches of the watershed much faster and with greater force.

The accompanying cross-section for 5,300 indicates that twice-bankfull flows are now 15 feet lower than the adjacent terraces, which greatly increases the likelihood for channel erosion. Then, as the channel erodes, it becomes even more entrenched, further increasing the rate of erosion. The condition is exacerbated by construction of streets, parking lots and buildings in close proximity to the bank edge. The channel will continue to broaden as Atascadero Creek tries to regain a new floodable terrace at a lower elevation. Hardening of the channel banks with concrete or similar hard surfaces tends to increase flow velocities even more, greatly increasing the potential for erosion on opposite banks.

The following diagram generally illustrates the progression of what has been occurring in many of the Upper Salinas River Watershed channels:



Estimated Progressive Changes in Atascadero Creek Channel from 1800 to 2002

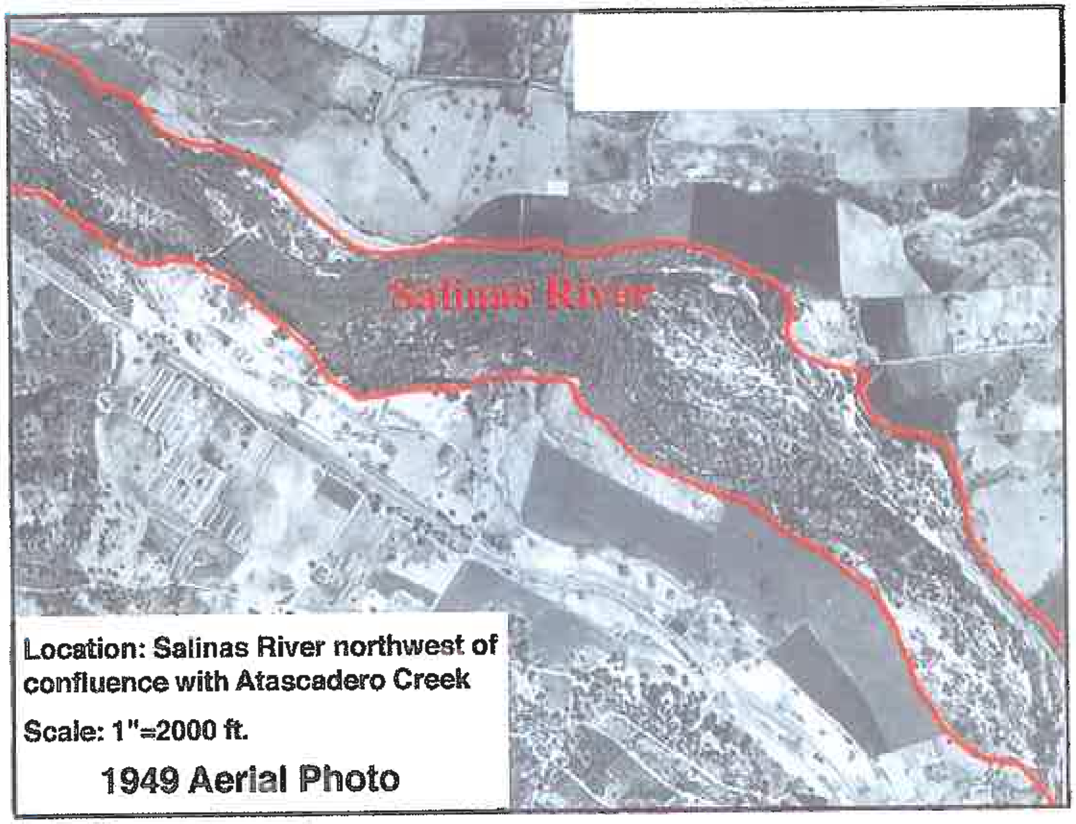
Site Location of Cross-Section: 350 feet southwest of West Mall Bridge

Observers that we have interviewed describe the creeks as having less flow and higher temperatures today than 50 years ago. This may be a major cause in the decline of steelhead in the region. An analysis of historical photographs show a gradual decline in channel vegetation. In many areas along the Salinas River, the vegetation is only 10 to 20 percent of the historical coverage. The decline is also noticeable on tributaries, but generally not to the same extreme as exhibited on the main channel of the Salinas. Substantial decline in vegetative cover are also noticeable on Huerhuero Creek and Estrella River and to a lesser extent on western channels such as Atascadero and Paso Robles Creeks. One cause of this decline may be the reduction of surface and subsurface water.

Vegetation within the channel has a significant impact on habitat condition and the stability of the channel. Loss of riparian vegetation and increases in channel cross section length increase the water surface exposed to the sunlight, and consequently increase the water temperature (Bauer & Burton, 1993). Also, the sparse vegetation on the bank channel contributes to increased stream temperature, water evaporation, and less shade is provided for the steelhead population.

The riparian vegetation communities have an ecological importance. The root system growing on stream banks helps hold soil in place, and reduces erosion problems. The stalks and branches provide refuge for insects and macroinvertebrates, and nesting places for varied populations of birds. The leaves are an energy source, providing oxygen to the environment and food for animals that live in this vegetation. Also, the riparian vegetation shapes the rivers and stream corridors, providing shade for the aquatic animals and plants in these ecosystems.

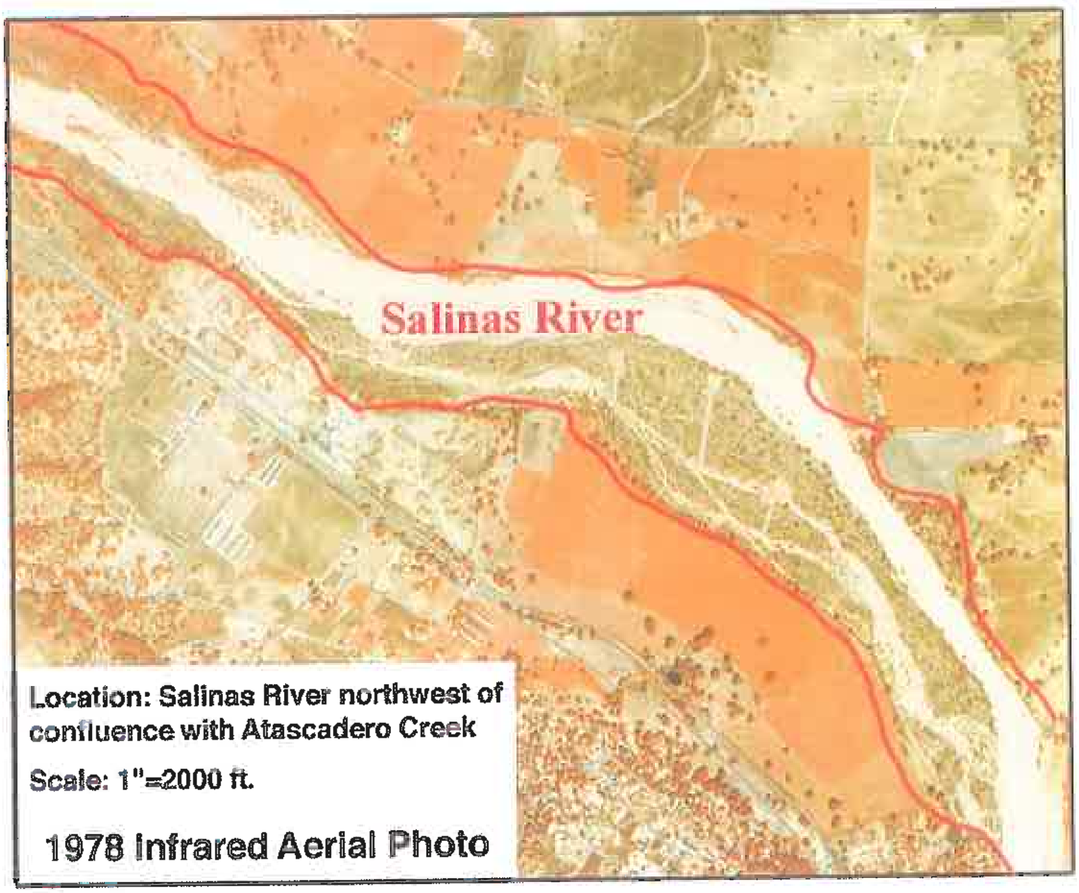
The following photo vegetation comparisons were conducted of two reaches on the Salinas River. The first location is a reach of the Salinas River at the northeast edge of the City of Atascadero. The 1949 photo of this reach indicates a channel vegetation coverage of 90 percent. By 1978, the channel riparian vegetation cover had decreased to 15 percent for the same reach. The second aerial photo comparison is of the Salinas River within the City of Paso Robles, south of the 13th Street bridge. The 1949 aerial photo of the Salinas River in Paso Robles shows riparian vegetation covering 75 percent of the channel. By 1978, the channel vegetation of this reach had dwindled to 20 percent. Also note that both the 1949 and the 1978 photos show a small tributary that met the Salinas River about where Walmart is located today. The riparian vegetation in that tributary was dense in 1949. In the 1978 infrared photo, much of the riparian vegetation was gone. That tributary was later placed in a concrete culvert under the Walmart parking lot.



Location: Salinas River northwest of confluence with Atascadero Creek

Scale: 1"=2000 ft.

1949 Aerial Photo



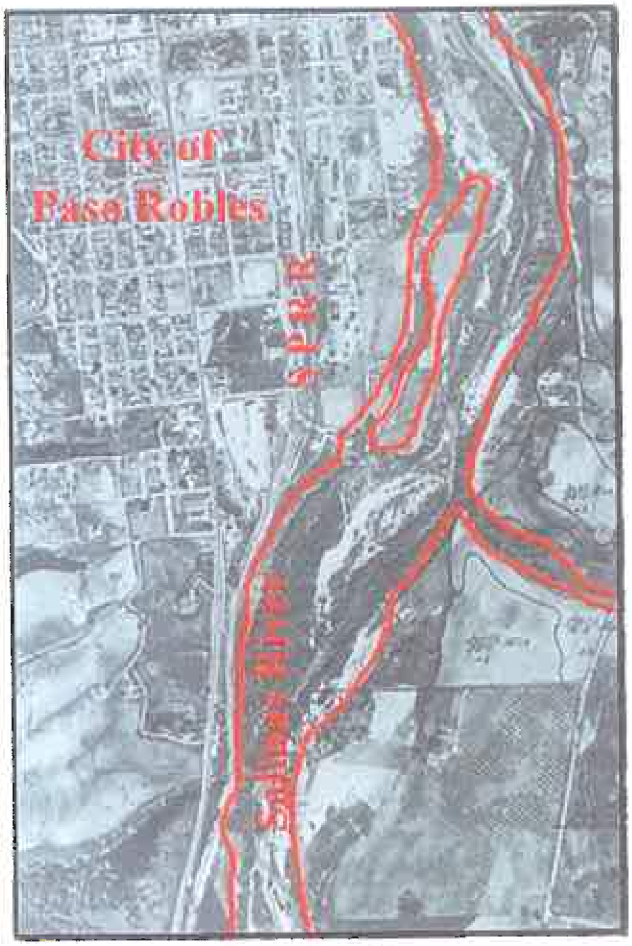
Location: Salinas River northwest of confluence with Atascadero Creek

Scale: 1"=2000 ft.

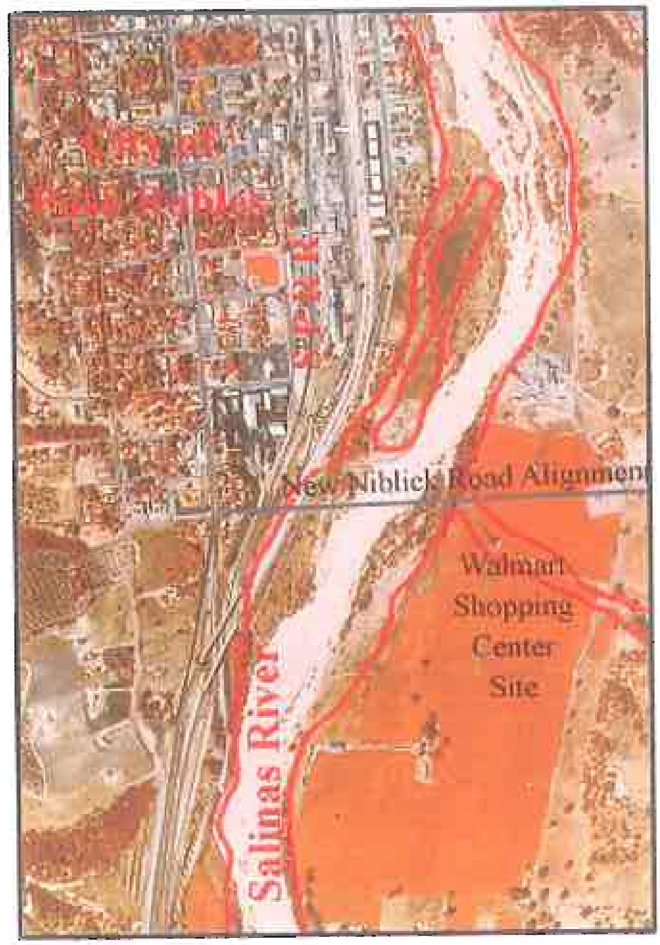
1978 Infrared Aerial Photo

Salinas River Vegetation Comparison Study

Salinas River Vegetation Comparison Study



1949 Aerial Photo



1978 Infrared Aerial Photo

Salinas River Near Paso Robles

D. Possible Causes for Reduced Stream Flow

Undoubtedly, the cause of reduced stream flows is due to several factors, including the following:

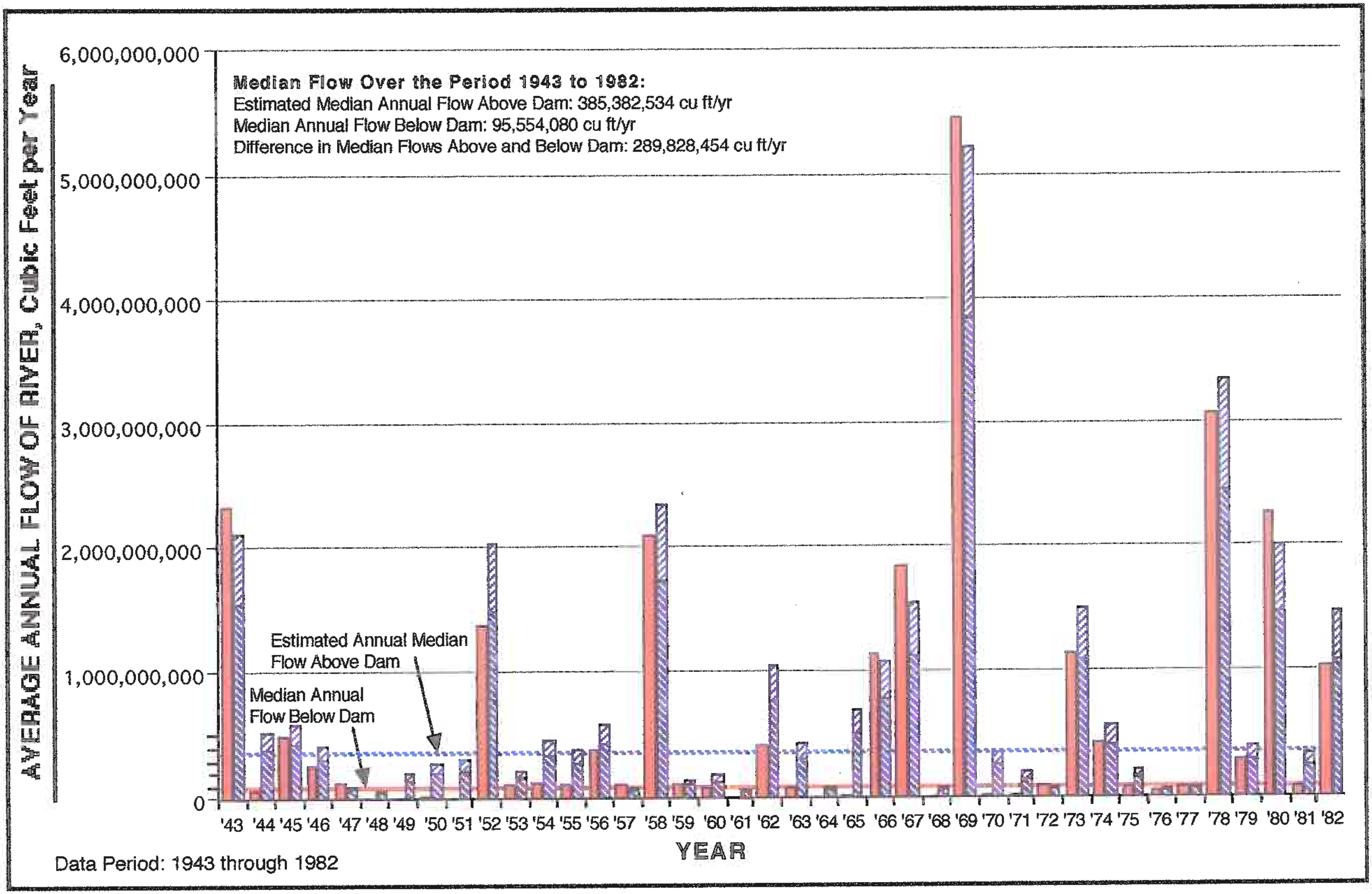
- √ Poor ground coverage with vegetation. When there is less ground coverage with vegetation, there is increased runoff during storms and less infiltration of water into the ground. Good ground coverage can result in as much as 90 percent of the water infiltrating into the soil. If there is poor coverage, infiltration can be as little as 40 to 50 percent. This results in less water reaching the groundwater table and more runoff during storms.

- √ Increase in impermeable surfaces, such as paving and buildings. Paved surfaces and buildings result in increased runoff during storms and less infiltration of water into the ground. Many streets, parking lots, driveways and buildings have been constructed within the urban areas of Atascadero, Paso Robles and Templeton over the past 50 years. For example, during stream sampling in the City of Atascadero, stream flows and sediment levels were significantly higher within the urban area than from the rural uplands. This was especially evident during the early storms of the rainy season. Water that normally would soak into the ground, runs off streets, driveways and rooftops draining quickly into the stream channels.

- √ Construction of dams on stream channels. According to local historians, the greatest reduction in steelhead was around the time of the construction of the Nacimiento Dam and Reservoir. According to these historians, prior to construction of the dam, the Nacimiento River had one of the largest populations of steelhead. The dam prevented steelhead from reaching spawning areas up the Nacimiento and its many tributaries.

  While less steelhead may have historically migrated up the Salinas River to the spawning areas near Pozo, the construction of the Salinas Dam also contributed to the decline of steelhead. In addition to becoming a barrier to steelhead migration, another impact of the Salinas Dam is the effect on flows down the Salinas River. The dam controls and diverts flows. It also traps natural sediment movement, affecting the health of the river below the dam.

  Using USGS gaging station data for the flows below and above the dam for the period between 1943 and 1982, the median annual flow above the dam was approximately 385,382,534 cubic feet per year. During that same period, the median annual flow below the dam was 95,554,080 cubic feet. The reduction, 289,828,454 cubic feet, was stream flow that historically would have nourished channel vegetation north of the dam and provided a means for steelhead to travel up and downstream between Monterey Bay and spawning areas high in Salinas tributaries.



Average Flow CFS Above the Dam Near Pozo USGS Gaging Station #11143500 Data

Estimated Additional Flow for 41.7 sq. mi. drainage area located between Dam and Pozo Gaging Station

Average Flow CFS Below the Dam Near Pilitas Creek USGS Gaging Stations #11145000 & #11144600 Data

Comparison of Salinas River Flows

Above and Below Salinas Dam, Santa Margarita Lake

Upper Salinas-Las Tablas RCD

√ Groundwater extraction for urban and agricultural uses. The cities in the Upper Salinas Valley have grown significantly over the past 50 years. Those communities must supply more water to meet the needs of their residents and businesses. Groundwater extraction near rivers and streams can create a trough in the subsurface water surface level, severely affecting the ability of plants to obtain needed moisture. The County of San Luis Obispo is currently studying the Paso Robles groundwater basin.

Agriculture has seen a gradual transition from cattle ranches that traditionally used little water, to vineyards and other farm crops that require irrigation. As with urban wells, groundwater extraction near streams for agriculture can create troughs or depressions that will affect riparian vegetation.

√ Climatic changes. While climate may impact the vegetation along the Salinas River, it probably plays a smaller role than the factors listed above. The Upper Salinas area is made up of many smaller climatic regions. The western range has rainfall averages of up to 50 inches per year. The Salinas valley has rainfall averages closer to 15 inches per year. The eastern Estrella region has rainfall averages of less than 10 inches per year, with the exception of the Parkfield area, which averages about 15 to 16 inches per year.

Based upon rainfall records for the City of Atascadero, the average annual rainfall for the past 85 years has been 17.8 inches. Perhaps median rainfall is a more important measurement, since averages include the extremely high rainfalls that occur only occasionally. The median rainfall is 16.03 inches per year.

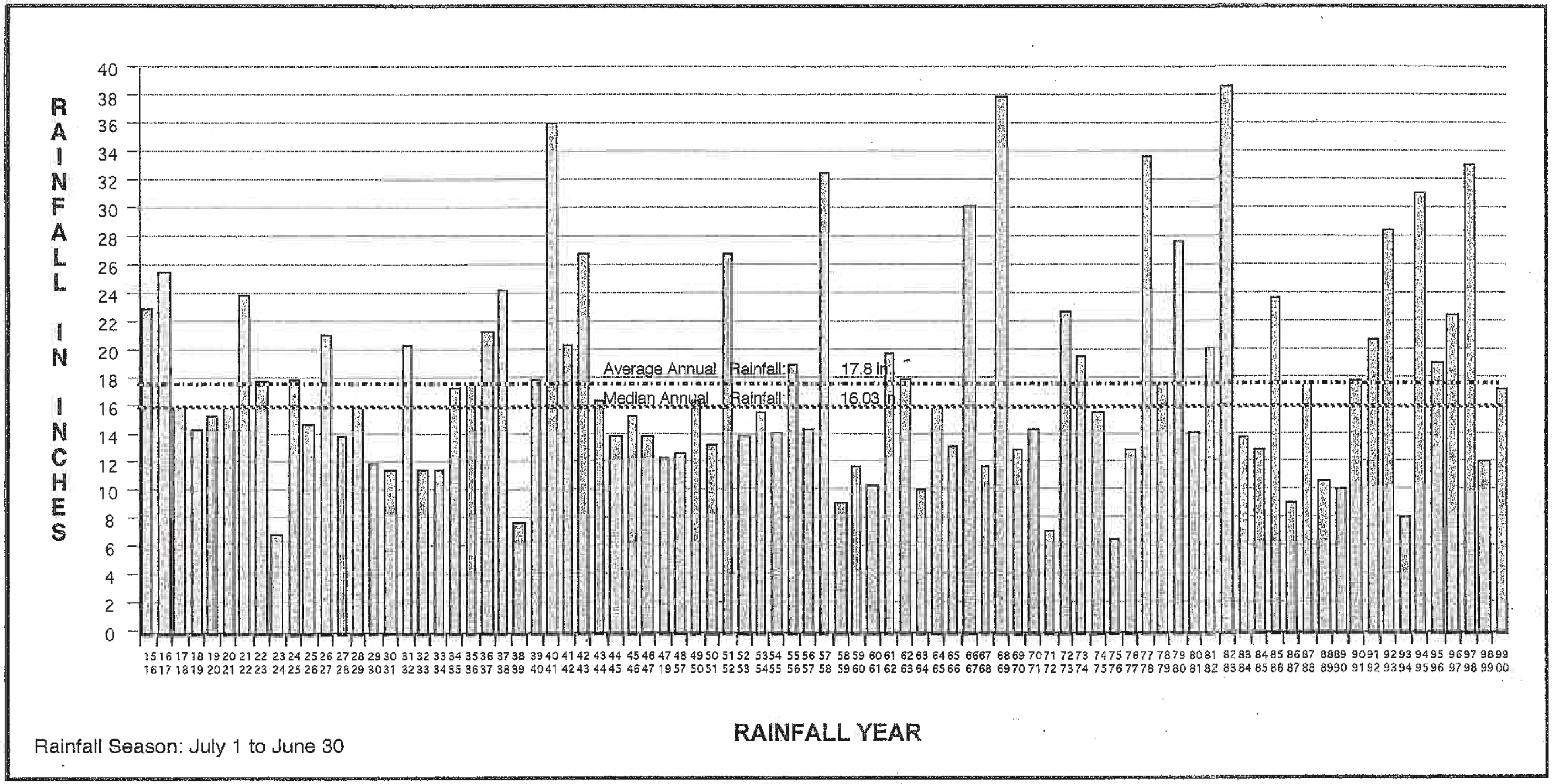
Weather pattern shift from year to year. During the past 100 years, rainfall has varied from wet to very dry periods. Floods are not uncommon. At other times, the region has suffered from serious droughts. The first recorded drought was soon after the arrival of the missionary Junipero Serra in 1771. Irrigation ditches were built at the San Antonio Mission near the San Antonio River to help ward off the problems associated with that drought. Another serious drought occurred around 1830 (Fisher). Droughts would often be followed by floods, then more droughts, then floods again. Some floods in the 1800's were described as being over two miles wide. A serious flood occurred in 1862. According to Anne B. Fisher, 30 inched fell in a short time. In 1863 and again in 1898, the Salinas Valley experienced other serious droughts.

Since 1900, the Salinas Valley has continued to experience periods of drought interspersed with brief periods flooding. For example, during the period from 1923 to 1933, there were 7 years of with less than the median rainfall and only 4 years with median or greater. Beginning in 1934 through 1943, there were 9 years of greater than median rainfall and only 1 year with less than median. Then, during the period from 1944 to 1960, there were 13 years with less than the median rainfall and only 4 years with greater than the median.

The end of the 20th century was a slightly more wet period, with 8 of the last 10 years having greater then median rainfall. If the past trends continue, the region could be in for several years of lower than median rainfall.

The following two graphs describe the rainfall recorded in Atascadero over the past 85 years. The first graph shows the flow in chronological order beginning in 1915-16. The rainfall season is from July 1 to June 30. There have been ten years with 10 or less inches of rainfall. Seasons with 10 inches or less occurred in 1923-24, 1938-39, 1958-59, 1960-61, 1963-64, 1970-71, 1975-76, 1986-87, 1989-90, and 1993-94. There have been 12 years with 26 inches or more rainfall. Seasons with 26 inches or greater occurred in 1940-41, 1942-43, 1951-52, 1957-58, 1966-67, 1968-69, 1977-78, 1979-80, 1982-83, 1992-93, 1994-95, and 1997-98.

The second graph is distributed by rainfall amount beginning with the lowest years to the highest years. That graph shows that rainfall is a curve rather than a straight line relationship.

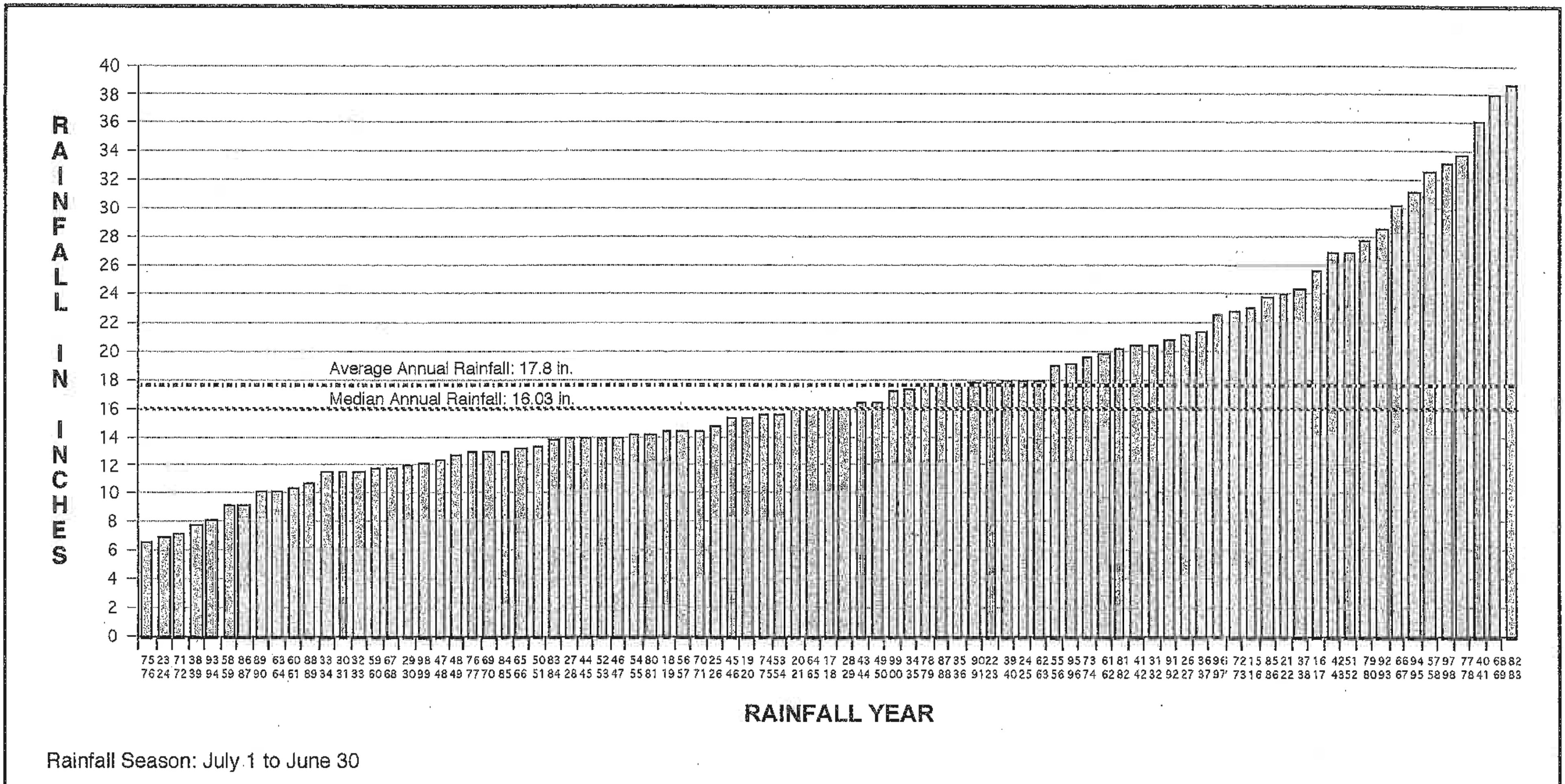


ATASCADERO RAINFALL RECORDS

85 Years: Rainfall Seasons, 1915-1916 to 1999-2000

Rainfall Data Source: Atascadero Mutual Water Company
Graph prepared by US-LT RCD

Upper Salinas-Las Tablas
Resource Conservation District



ATASCADERO RAINFALL RECORDS
85 Years: Rainfall Seasons: 1915-1916 to 1999-2000

Rainfall Data Source: Atascadero Mutual Water Company
Graph prepared by US-LT RCD

Upper Salinas-Las Tablas
Resource Conservation District

High flows along the Salinas River during winter at the San Miguel bridge

The Estrella River during a storm at the North River Road crossing. The Estrella carries significant amounts of suspended sediments during storm flows.

CHAPTER IV
Recommendations

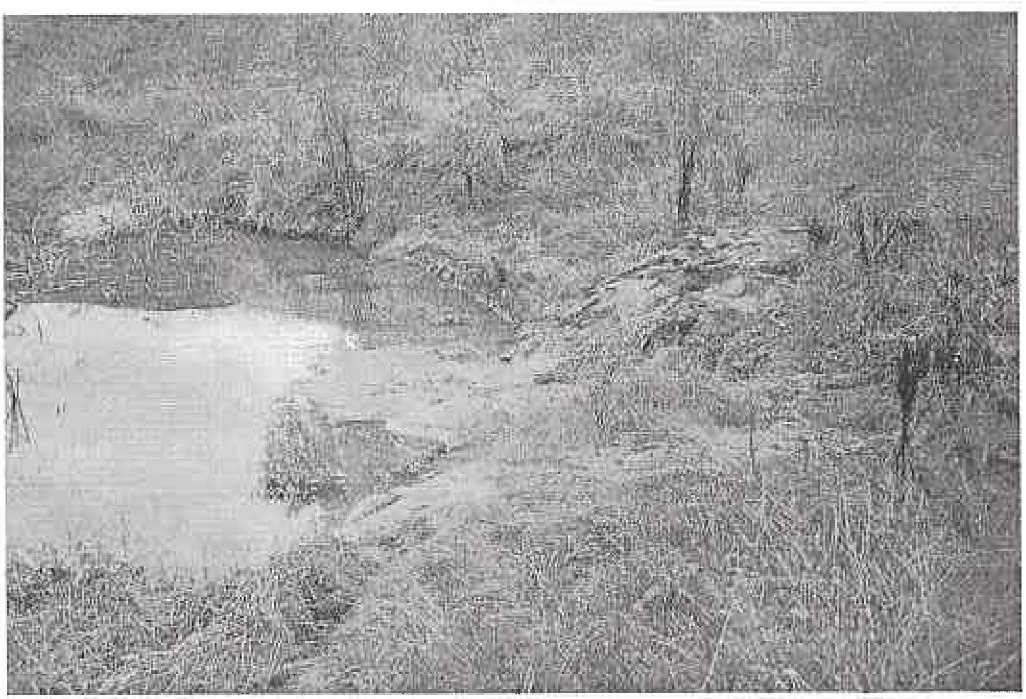
IV. RECOMMENDATIONS

While steelhead populations in the Salinas River and tributaries have dwindled, this study indicates that there are still steelhead in a number of streams in the region. In particular, Steelhead remain in Santa Margarita Creek, Tassajara Creek, Atascadero Creek, Paso Robles Creek and Jack Creek. In order to improve the conditions for Steelhead, a list of proposed actions has been prepared. These actions were derived from the deliberations and input received from the Upper Salinas Watershed Task Force and Technical Advisory Committee.

The list of proposed actions are contained on the table at the end of this chapter. The table contains a summary of recommended actions for possible Department of Fish and Game SB 271 funding. Other actions involving additional upland planning measures are being prepared by the RCD. The funding to implement these upland actions will be from sources other than SB 271 funds.

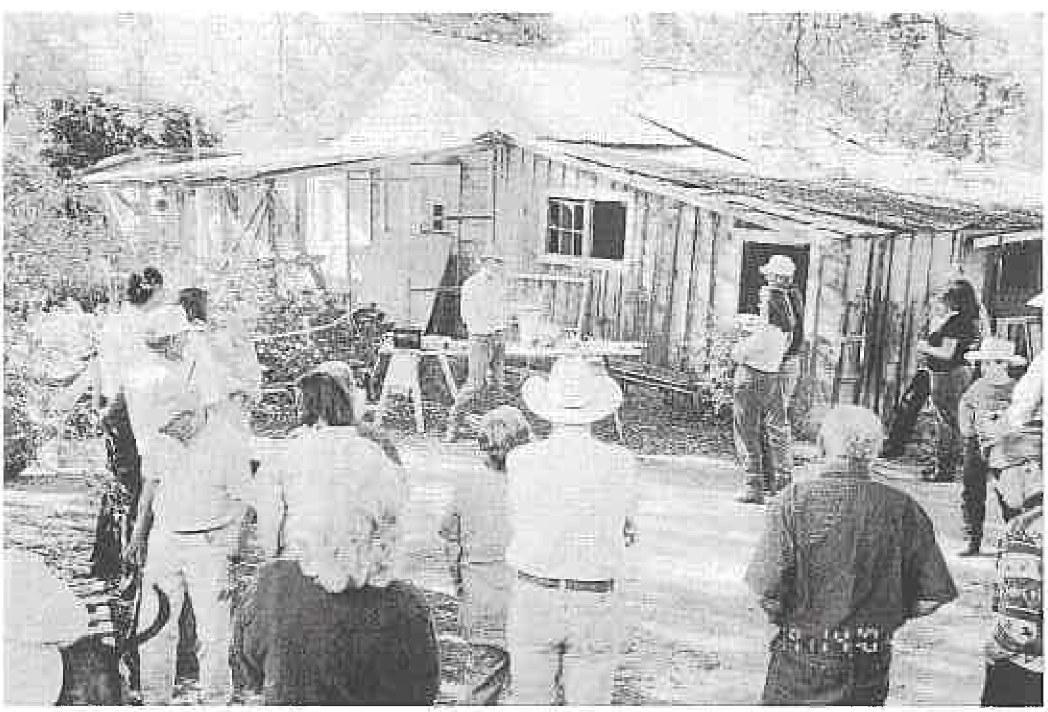
Removing fish barriers will help steelhead to access spawning areas

Prevent erosion from roads that result in sediment in streams



Creek clogged with sediment from soil erosion caused by road in photo above

The public learns about importance of clean water and protecting habitat at a Watershed Educational Fair



Beneficial Management Practices Education Program for Ranchers and Farmers

Oil pollution from streets and parking lots drains into creeks

Buildings constructed close to creeks create unsafe conditions

Urban pollution harms animals and vegetation in creeks

Soil eroded from roads creates sediment in streams

STATE DEPARTMENT OF FISH AND GAME - EARLY ACTION LIST
UPPER SALINAS - LAS TABLAS RESOURCE CONSERVATION DISTRICT

#	PROPOSED ACTION DESCRIPTION	LOCATION OF ACTIONS	BENEFITS OF ACTIONS	STEELHEAD PRIORITY	LEAD AGENCY/ GROUP	COOPERATING AGENCY & GROUP	APPROXIMATE TIMELINE	PROPOSED FUNDING SOURCE	PERMITTING AGENCIES
1	Conduct habitat typing on streams, following criteria of the California Salmonid Stream Habitat Restoration Manual, to identify prime steelhead sites within the Salinas River Watershed, including historical sites to identify habitat improvement. Prepare report on survey.	1. Atascadero Creek & tributaries 2. Paso Robles Creek & tributaries 3. Nacimiento River & tributaries 4. Salinas River & tributaries 5. Santa Margarita Creek & tributaries	This action will provide the information necessary to determine the suitable areas for Steelhead habitat improvements, Steelhead migration and spawning and locations that can be restored by the application of the California Salmonid Stream Habitat Restoration Manual. This action also will be the baseline for implementing projects that will restore and enhance the Steelhead habitat in the Upper Salinas Watershed.	1st Priority HIGH	US-LT RCD	CCC, F&G, NRCS, Central Coast Salmon Enhancement, RC&D.	3 Years. 3-6 months for contacts. 24 - 30 months for survey. 6 months for report.	F&G, SB(271) and Private Foundations.	No permits, Landowners permission only
2	Identify and assess fish passage barriers, in order to do a barrier modification and removal projects.	1. Atascadero Creek (Curbaril sewer line at Atascadero road crossing; swimming hole corrections). 2. Paso Robles Creek (Hidden Valley Ranch on Paso Robles Creek). 3. Nacimiento River 4. Salinas River	Improve the Steelhead ability to reach the spawning areas	HIGH	Landowner/US-LT RCD	F&G, NRCS, RC&D, CCC, NMFS.	2 Years each.	F&G, NOAA, Private Pacific Coast Recovery Foundation. SB(271), EQIP, WHIP, Private Foundations.	No permits, Landowners permission only

#	PROPOSED ACTION DESCRIPTION	LOCATION OF ACTIONS	BENEFITS OF ACTIONS	STEELHEAD PRIORITY	LEAD AGENCY/ GROUP	COOPERATING AGENCY & GROUP	APPROXIMATE TIMELINE	PROPOSED FUNDING SOURCE	PERMITTING AGENCIES
3	Identify and pursue enhancement of reaches on 5 streams that would benefit from additional habitat enhancement. Projects recommended by California Salmonid Stream Habitat Restoration Manual include: Revegetation, bank stabilization, digger log, rock structures, and control of non-native plants in channels.	1. Atascadero Creek & tributaries 2. Paso Robles Creek & tributaries 3. Nacimiento River & tributaries 4. Salinas River & tributaries 5. Santa Margarita Creek & tributaries	Improve the Steelhead habitat conditions for migration; spawning and life cycle development in 5 locations. The enhancement locations will serve as environmental model for other creeks into the Upper Salinas Watershed.	HIGH	CCC/US-LT RCD	Farm Bureau, CCC, Atascadero City Council, Paso Robles City Council, Santa Margarita . Community, Schools, F&G, NRCS, US-LT RCD, RC&D, NMFS.	2 - 4 Years	F&G, SB(271), WHIP, EQIP, NRCS, Private Foundations.	Landowners, F&G, RWQCB, County of San Luis Obispo, Army Corps.
4	Improve drainage system on existing roads near streams to diminish sediment discharge on streams, and decommission roads along the creeks.	1. Atascadero Creek & tributaries 2. Paso Robles Creek & tributaries 3. Nacimiento River & tributaries 4. Salinas River & tributaries 5. Santa Margarita Creek & tributaries	Clean the water to avoid Steelhead suffocation by suspended sediments trapped on the gills.	HIGH	US-LT RCD	F&G, Farm Bureau, SWRCB, NRCS, CCC	2 Years	SB(271), WHIP, EQIP, F&G, NRCS	Landowners and County of San Luis Obispo for all projects. F&G, RWQCB, and Army Corps for streams crossings.
5	In riparian buffer areas, improve riparian vegetation coverage, and restore wetlands.	1. Atascadero Creek & tributaries 2. Paso Robles Creek & tributaries 3. Nacimiento River & tributaries 4. Salinas River & tributaries 5. Santa Margarita Creek & tributaries	Good water quality and optimal temperature will benefit the Steelhead spawning areas, the fry development, and the increase of their populations into the Upper Salinas Watershed. Also reduces sedimentation in creeks.	HIGH	US-LT RCD	F&G, CCC, NRCS, RWQCB .	2 Years	SB(271), WHIP, EQIP, F&G, NRCS, and Urban Streams Grant.	F&G
6	Encourage use of buffers in vineyards, orchids, and managed cattle access within riparian areas. Use examples of good land use techniques (including creek setbacks) to show how to solve problems.	1. Atascadero Creek & tributaries 2. Paso Robles Creek & tributaries 3. Nacimiento River & tributaries 4. Salinas River & tributaries 5. Santa Margarita Creek & tributaries	With clean water in the creeks, the Steelhead habitat will be improved for spawning and fry survival. The examples of good land use techniques will be an extension model for several ranches into the Upper Salinas Watershed.	HIGH	US-LT RCD and Central Coast Vineyard Team.	F&G, Farm Bureau, NRCS, CCC.	2 Years	WHIP, EQIP, F&G, SB(272), NRCS, Private Foundations.	F&G, Army Corp.

#	PROPOSED ACTION DESCRIPTION	LOCATION OF ACTIONS	BENEFITS OF ACTIONS	STEELHEAD PRIORITY	LEAD AGENCY/ GROUP	COOPERATING AGENCY & GROUP	APPROXIMATE TIMELINE	PROPOSED FUNDING SOURCE	PERMITTING AGENCIES
7	Identify and implement high visibility for stream restoration project in urban area. For example: Restoration of channel along Atascadero School District site.	1. Atascadero Creek & tributaries 2. Salinas River & tributaries	Restoration project could be a paired study to evaluate the benefits of the project, and present the data for convince and involve local agencies.	MEDIUM TO HIGH	US-LT RCD	F&G, CCC, NRCS, RWQCB .	3 Years to complete	SB(271), WHIP, F&G and NRCS, Urban Streams Grant.	Landowners, F&G, RWQCB, County of San Luis Obispo, Army Corps.
8	Limit offroad vehicle use within stream channels Many landowners want these people off their land, there is a real problem with illegal trespassing.	1. Atascadero Creek & tributaries 2. Paso Robles Creek & tributaries 3. Nacimiento River & tributaries 4. Salinas River & tributaries 5. Santa Margarita Creek & tributaries	With restrictions on OHV use, the habitat for Steelhead will be protected.	MEDIUM TO HIGH	US-LT RCD	F&G, Sheriff Department, CCC, Atascadero City Council, Paso Robles City Council, Templeton Community.	2 Years	WHIP, SB(271), F&G, NRCS, and Urban Streams Grant.	Landowners, County of San Luis Obispo
9	Conduct a community outreach program regarding the value of maintaining fisheries. Show the benefits of programs to help fish populations, urban areas and landowners. Write articles, quarterly newsletter, press releases and videos, concerning to the Salinas Watershed facts and conservation benefits - needs. Promote short courses, workshops, student poster contest and create a mascot.	Watershed wide.	Help the public to better understand the need for improving Steelhead population. Generate support for actions that benefit Steelhead habitats. Build trust in the programs sponsors, in the agencies involved and between watershed stakeholders. The public will be come better stewards of their environment.	MEDIUM TO HIGH	US-LT RCD	F&G, NRCS, Schools, non-profit organizations, Anglers groups. CAL POLY, Mr. Harold Franklin, Dr. Dan Krieger and Historical Society. CCC, RWQCB, MBNMS, UC Cooperative Extension, Farm Bureau, RC&D, local media.	Yearly, start in 1 Year	SB(271), EQIP, Private Foundations, MBNMS. May be "CAL-POLY", NRCS, F&G, RC&D.	No

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APPENDEX A
Channel Sections and Data

APPENDIX A

Longitudinal and Cross-Sectional Diagrams

The study of the Salinas River and tributaries has included detailed surveys of the channel morphology. Both longitudinal and cross-sectional surveys have been conducted. Longitudinal sections follow along the thalweg of the stream. The thalweg is the lowest point of the channel. The sectional diagrams for longitudinal data are taken from the thalweg data for each stream.

Cross-sections are taken a various points along the channel and are measured at perpendicular to the thalweg. Longitudinal diagrams indicate the locations of riffles and pools. Since the data is difficult to interpret if portrayed at a one-to-one ratio, vertical to horizontal scale, the vertical scale in each of the diagrams has been purposely exaggerated. This allows the evaluator to more clearly see where pools exist, and define their length and depth more easily.

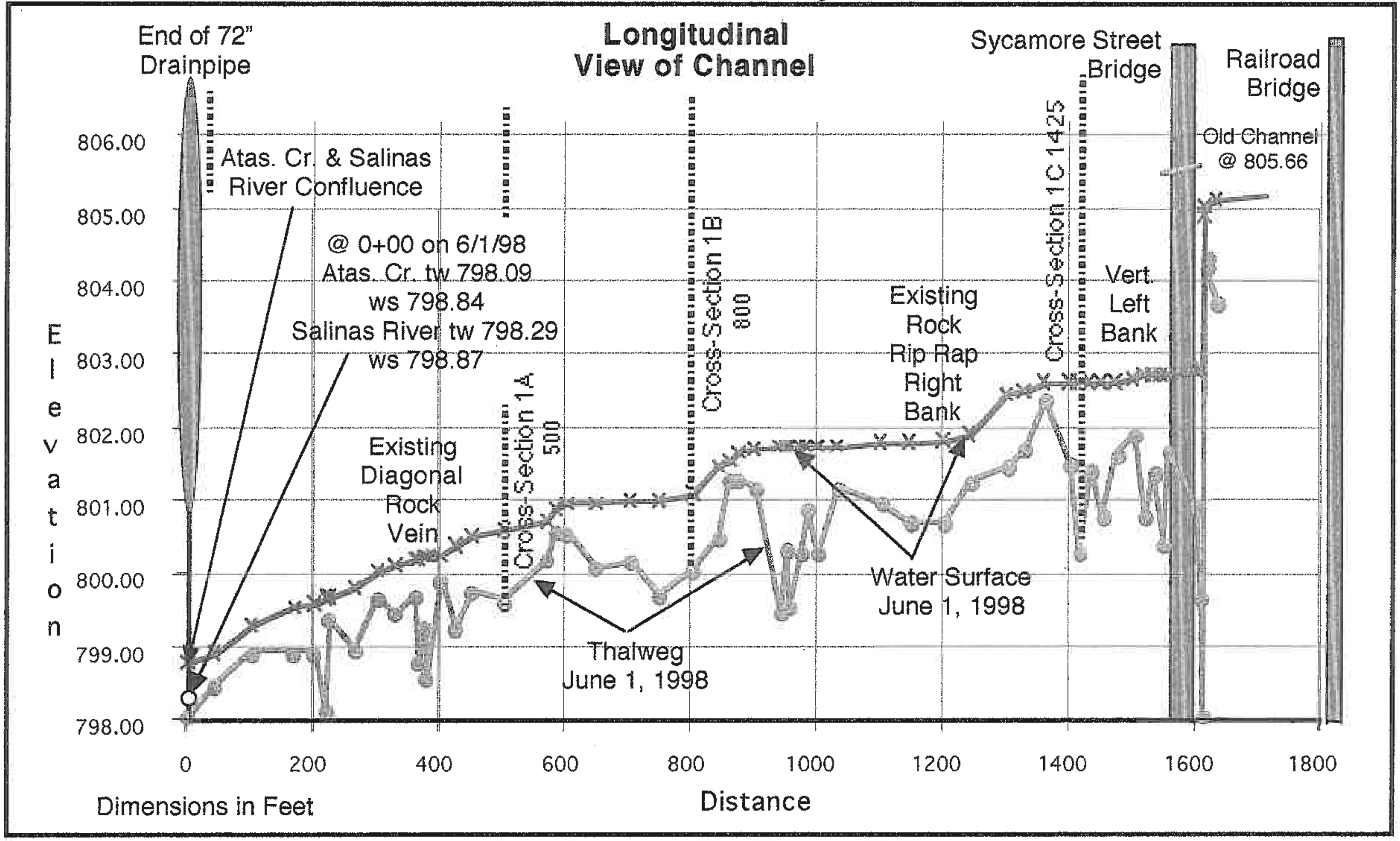
The data spreadsheets corresponding to each graph have also been attached.

Atascadero Creek Channel Diagrams and Spreadsheets
Reach 0-1,800 feet from confluence with Salinas River

Cu... Colle... Cour... 1188...
Assisted by AmeriCorps
and California Conservation Corps

... cooperation with the Atascadero
Mutual Water Company

Atascadero Creek Longitudinal Profile
0-1,800 Feet from Confluence of Salinas River
June 1998 Survey



Creek Stabilization Project
STREAM CHANNEL
MORPHOLOGICAL ANALYSIS

Upper Salinas-Las Tablas
Resource Conservation District

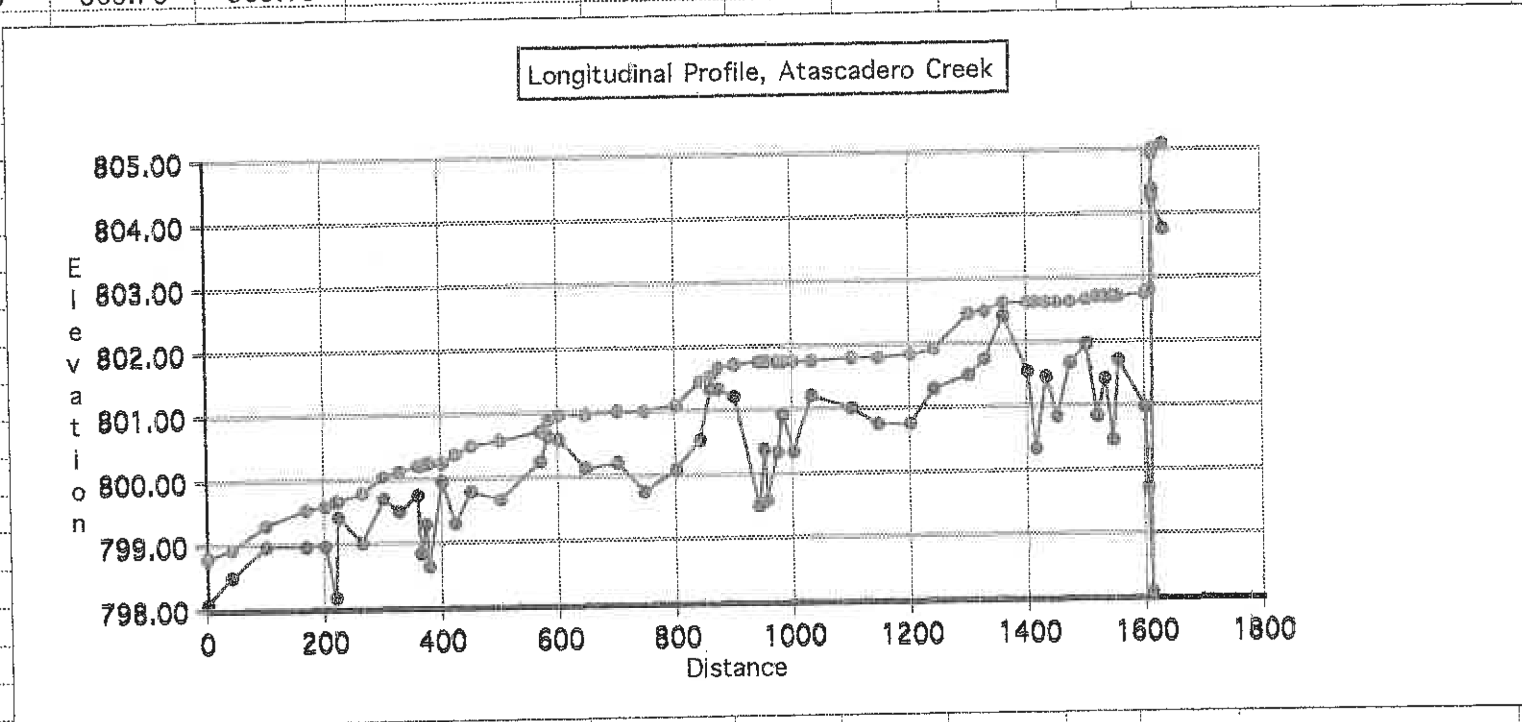
Atascadero Creek Longitudinal Morphological Survey

GENERAL LOCATION:	0-1,800 feet upstream from confluence with Salinas River
BASIS FOR BEGINNING DISTANCE:	
STUDY PREPARED FOR:	USLT-RCD
SURVEY TEAM:	D. J. Funk, Cuesta College Class, course #1188.200- Jim Patterson, Susan Litteral, Jody Olsen, Alison Jones, Dick Hefner.
OTHERS ASSISTING:	CCC Crew: Paul Corsi & Stacy Smith; Data Entry and Graphing
DATE(S) OF SURVEY:	June 1, 1998
GENERAL:	All distances in ft. Beginning elevation estimated from USGS map. Elevation TW Salinas 805.73-7.44, 798.29 WS elev 805.73-6.86: 798.87 Distance estimated: 0-1,800 ft. est. from confluence with Salinas River based on USGS Quad and 1981 FEMA study. B.M. pins are estimated. View orientation: downstream.
TERMS:	B.M.=Bench Mark, T.W.=Thalweg, W.F.=Water Surface, bkf=Bankfull, B.P.=Bank Pin

Distance Salinas R.	Thalweg Elev.	Water Surface	Reading TW	Reading WS	B M	B M Reading	Level Elev.	B M BS	Comments
0	798.09	798.84	7.64	6.89	800.97	4.76	805.73		Bottom End of 4 ft. drain pipe
39	798.51	798.97	7.22	6.76			805.73		
100	798.97	799.35	6.76	6.38			805.73		
167	798.95	799.60	6.78	6.13			805.73		
200	798.94	799.61	6.79	6.12			805.73		
219	798.15	799.69	7.58	6.04	804.04	1.69	805.73	###	Cottonwood burl TBM: 804.04
225	799.41	799.69	6.32	6.04			805.73		
265	798.99	799.82	6.74	5.91			805.73		
300	799.70	800.10	6.03	5.63			805.73		
328	799.48	800.18	6.25	5.55			805.73		
359	799.77	800.27	5.96	5.46			805.73		
363	798.84	800.27	6.89	5.46			805.73		
371	799.29	800.28	6.44	5.45			805.73		
379	798.62	800.30	7.11	5.43			805.73		
400	799.94	800.31	5.79	5.42			805.73		
423	799.31	800.40	6.42	5.33			805.73		
452	799.80	800.53	5.93	5.2	801.61	4.12	805.73		Wilson Survey, Control on Left bank
500	799.68	800.62	6.05	5.11			805.73		Bkf. Elev: 801.79, Bkf Reading:3.94
566	800.23	800.74	5.5	4.99			805.73		

	A	B	C	D	E	F	G	H	I	J	K
38	582	800.62	800.90	5.11	4.83			805.73			
39	600	800.58	800.99	5.15	4.74			805.73			
40	646	800.12	801.02	5.61	4.71			805.73			
41	700	800.22	801.05	5.51	4.68			805.73			
42	746	799.77	801.06	5.96	4.67			805.73			
43	800	800.07	801.12	5.66	4.61	806.72		805.73	2.68	Bkf. Elev:802.52, Bkf Reading:4.2, Cottonwood	
44	843	800.56	801.51	6.16	5.21			806.72			- burl TBM: 804.04
45	858	801.34	801.58	5.38	5.14			806.72			
46	875	801.35	801.71	5.37	5.01			806.72			
47	900	801.21	801.73	5.51	4.99			806.72			
48	942	799.51	801.78	7.21	4.94			806.72			
49	951	800.38	801.79	6.34	4.93			806.72			
50	956	799.57	801.79	7.15	4.93			806.72			
51	972	800.33	801.80	6.39	4.92			806.72			
52	982	800.90	801.80	5.82	4.92			806.72			
53	1000	800.32	801.80	6.4	4.92			806.72			
54	1032	801.22	801.80	5.5	4.92			806.72			
55	1100	801.01	801.82	5.71	4.9			806.72			
56	1147	800.75	801.84	5.97	4.88			806.72			
57	1200	800.76	801.86	5.96	4.86	797.27	3.72	806.72	4.27	TBM, Rock in Creek: 803.00	
58	1240	801.31	801.95	5.96	5.32			807.27			
59	1300	801.52	802.50	5.75	4.77			807.27			
60	1327	801.75	802.54	5.52	4.73			807.27			
61	1361	802.42	802.65	4.85	4.62			807.27			
62	1400	801.54	802.66	5.73	4.61			807.27			
63	1413	800.33	802.67	6.94	4.6			807.27			
64	1432	801.46	802.67	5.81	4.6			807.27			
65	1448	800.83	802.67	6.44	4.6			807.27			
66	1474	801.67	802.67	5.6	4.6			807.27			
67	1500	801.95	802.71	5.32	4.56			807.27			
68	1518	800.83	802.73	6.44	4.54			807.27			
69	1534	801.41	802.74	5.86	4.53			807.27		Old Channel at 805.66 elev.	
70	1545	800.44	802.74	6.83	4.53			807.27			
71	1556	801.72	802.74	5.55	4.53			807.27			
72	1600	800.94	802.81	6.33	4.46			807.27			
73	1605	799.70	802.84	7.57	4.43			807.27			
74	1610	798.10	802.85	9.17	4.42			807.27			

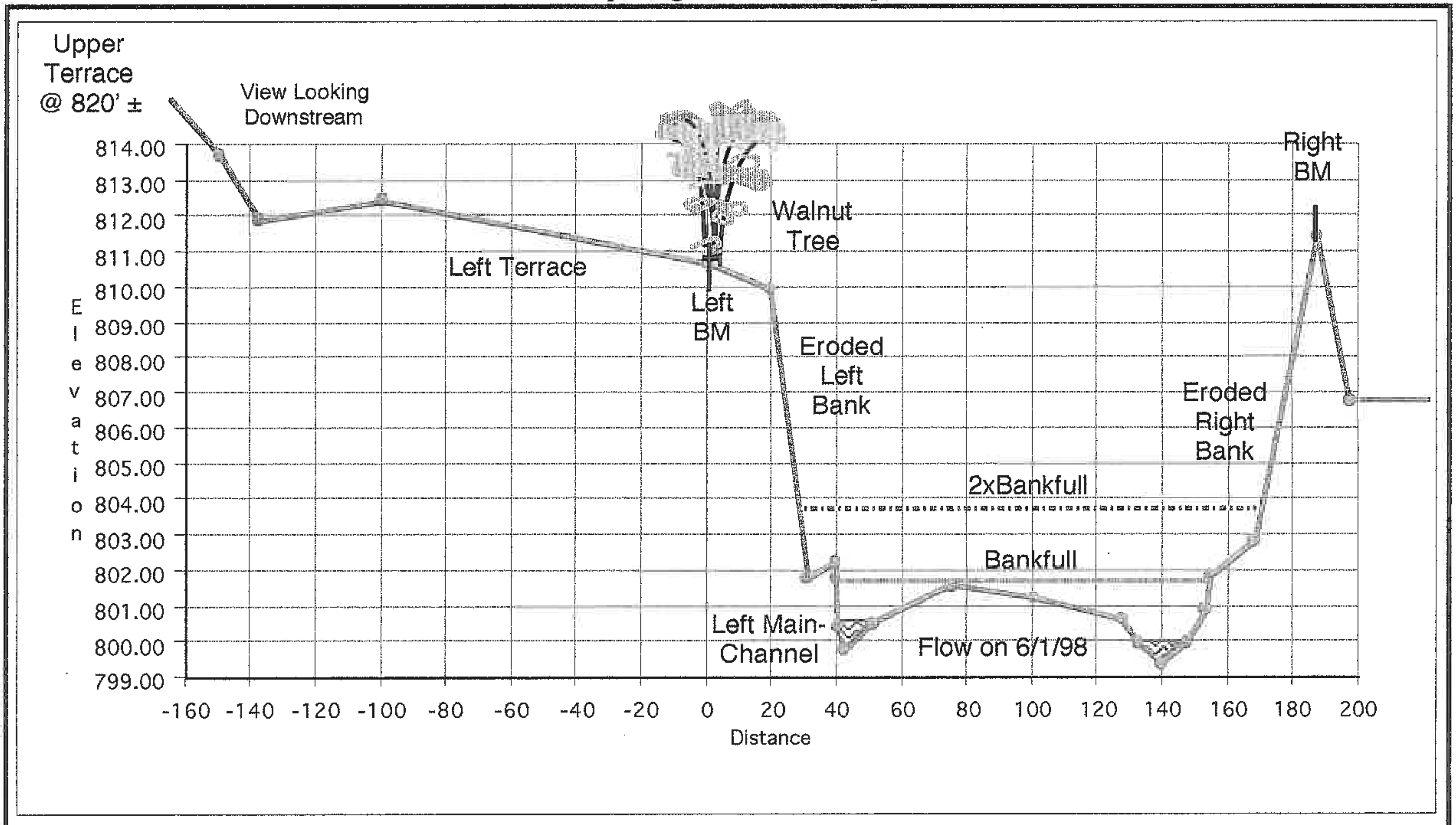
	A	B	C	D	E	F	G	H	I	J	K
75	1612	804.39	804.96	2.88	2.31			807.27			
76	1615	804.25	805.07	3.02	2.2			807.27			
77	1630	803.76	805.16	3.51	2.11			807.27			
78	1821										



Assisted by AmeriCorps
and California Conservation Corps

in cooperation with Atascadero
Mutual Water Company

Cross-Section Atascadero Creek
500 Feet from Confluence of Salinas River
Spring 1998 Survey



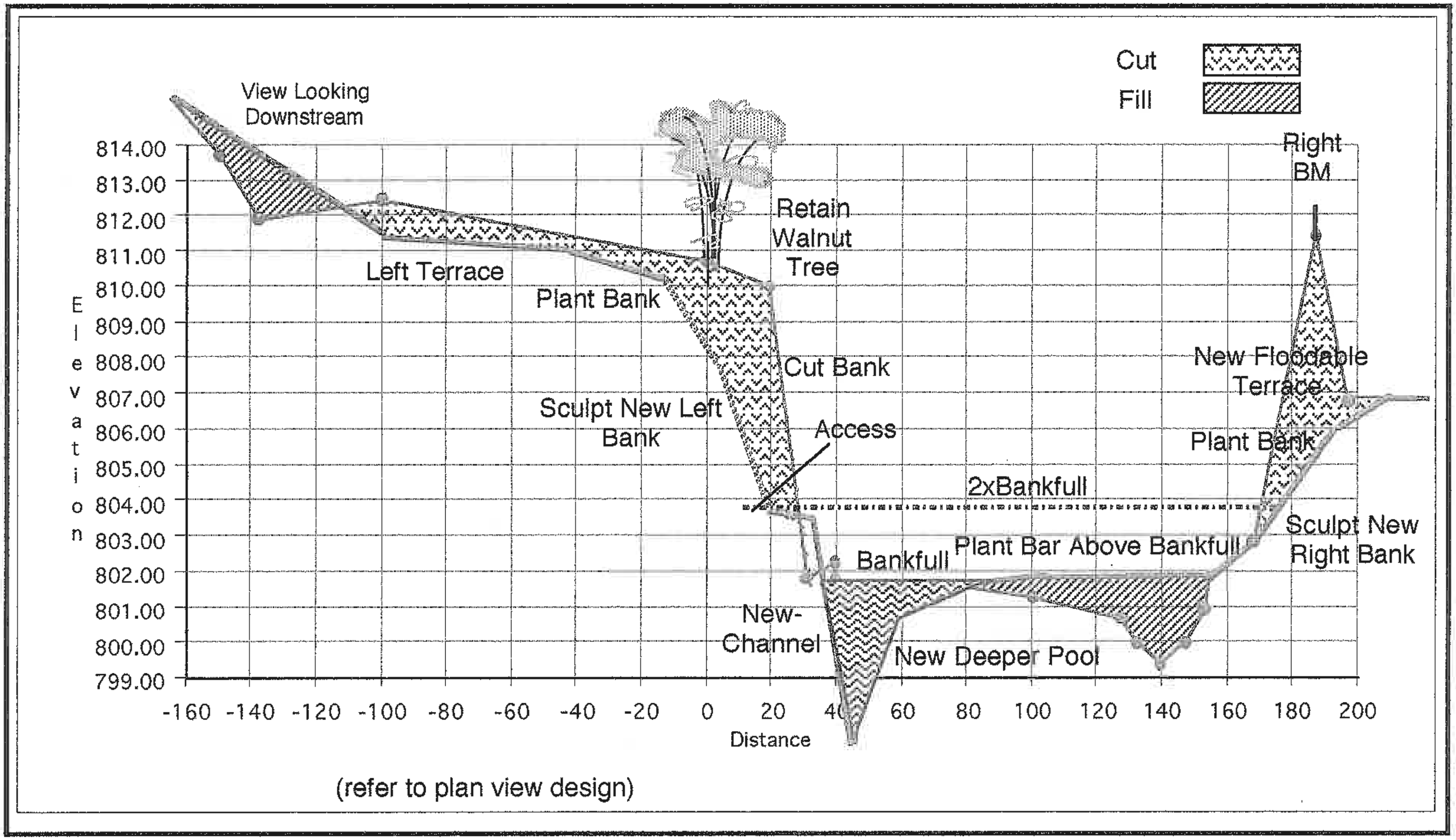
Atascadero Creek
STREAM CHANNEL
MORPHOLOGICAL ANALYSIS

Upper Salinas-Las Tablas
Resource Conservation District

in cooperation with Atascadero
Mutual Water Company

Cross-Section Atascadero Creek
500 Feet from Confluence of Salinas River
Stream Channel Project Solution 1A

View Looking
Downstream



Atascadero Creek
STREAM CHANNEL PROPOSED PROJECT REHABILITATION

Phase 1 Channel bank
Re-grading completed by
Atascadero Mutual Water Co.

Upper Salinas-Las Tablas
Resource Conservation District

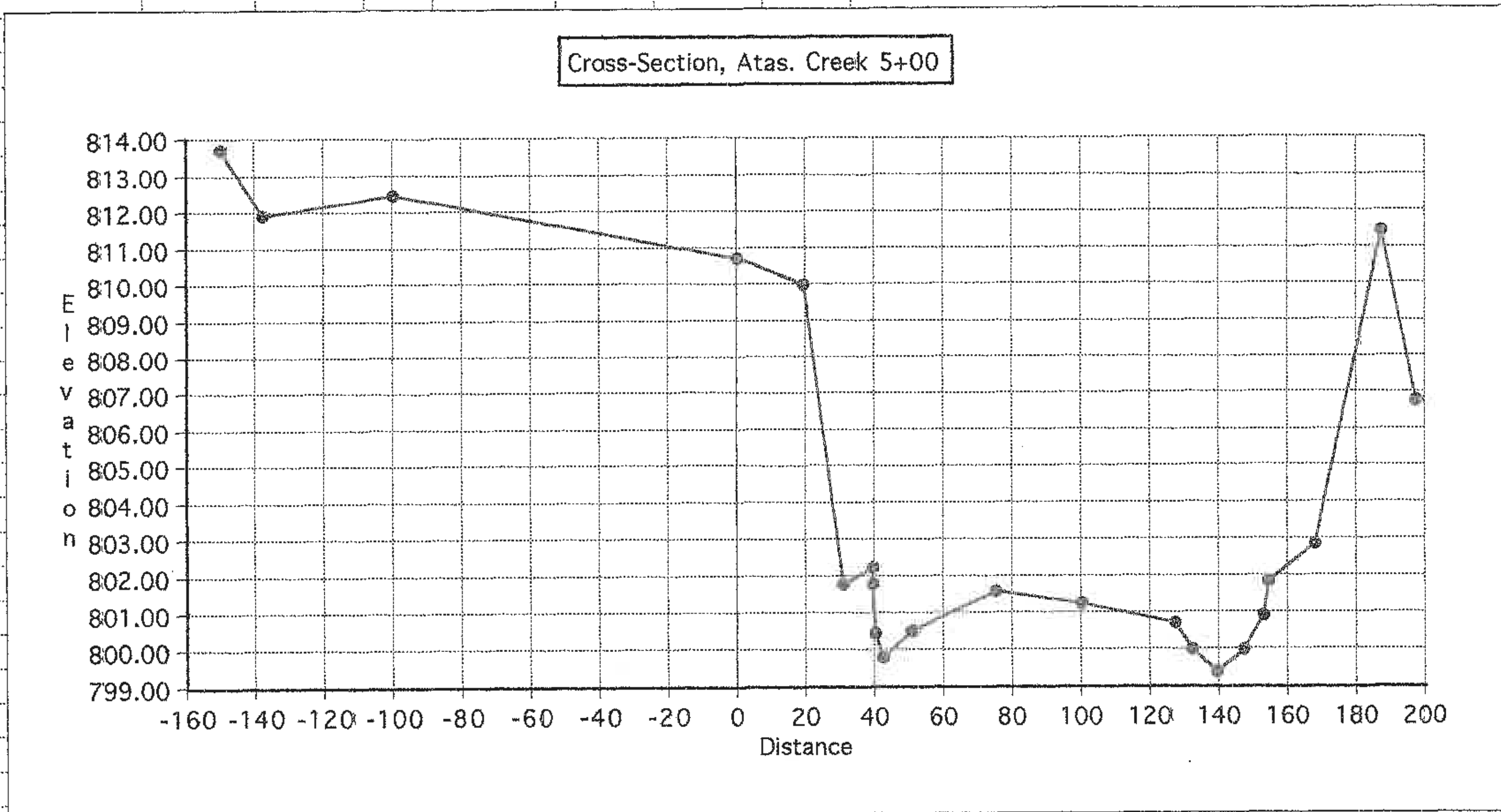
Atascadero Creek Cross-Section 500

	A	B	C	D	E	F	G	H	I
3	Distance	Ground	Reading	Bkf	Bench	BM	Level	BM	
4	from Left BM.	Elev.	Section		Mark	Reading	Elev.	BS	
5	-150	813.72	0.91				814.63		Bank of Upper Left Terrace
6	-138	811.95	2.68				814.63		Left Middle Terrace
7	-100	812.47	2.16		810.51	4.12	814.63		Wilson Survey, Control on Left bank, n-west of walnut tree
8	0	810.71	3.92		810.87	3.76	814.63		Left BM, Plastic Pipe 11ft. so. of walnut tree
9	19	809.99	4.64				814.63		
10	31	801.81	3.92		804.04	1.69	805.73	10.59	Cottonwood burl TBM: 804.04
11	39	802.25	3.48				805.73		
12	39.5	801.79	3.94	Bkf			805.73		Atas. Creek Watershed: 19.8 sq. miles
13	40	800.47	5.26				805.73		Bkf depth: 2.15, Bkf width, gross: 114 ft.
14	42	799.77	5.96				805.73		2x Bkf depth: 4.30, 2x Bkf width, 140 ft.
15	51	800.53	5.2				805.73		X-Sectional Area, Bkf: 125 sq. ft.,
16	75	801.59	4.14				805.73		Bkf Flow est. at 6 ft/sec: 750 cubic ft./sec
17	100	801.28	4.45				805.73		Bkf Flow est. from typ. watershed*: 772 cubic ft./sec
18	127	800.70	5.03				805.73		WD Ratio: 53 (Extremely high WD ratio)
19	132	799.98	5.75				805.73		Entrenchment Ratio: 1.23 (Highly entrenched)
20	139	799.39	6.34				805.73		Sinuosity Ratio: 1565/1400: 1.12 (Low Sinuosity)
21	147	800.00	5.73				805.73		
22	153	800.95	4.78				805.73		
23	154	801.90	3.83	Bkf			805.73		
24	168	802.89	2.84				805.73		
25	187	811.50	3.13		812.04	2.59	814.63		Right Plastic BM: 112.04
26	197	806.83	7.8				814.63		Right Terrace (located between Salinas R. and Atas. Cr.)
27									
28									

29 * Salsipuedes Creek Watershed Gage Data Average for 14 yrs.: 59 cu. ft./sec/sq. mi. (return of 1.5 yrs. on average)

30 This figure is believed to be high; Atas. Cr. Watershed anticipated to receive 2/3 flow of Salsipuedes Cr. Watershed

31 Atas. Creek est. Bkf flow of 39 cu ft./sec/sq. mi. since this area typically receives less rainfall than Pozo area



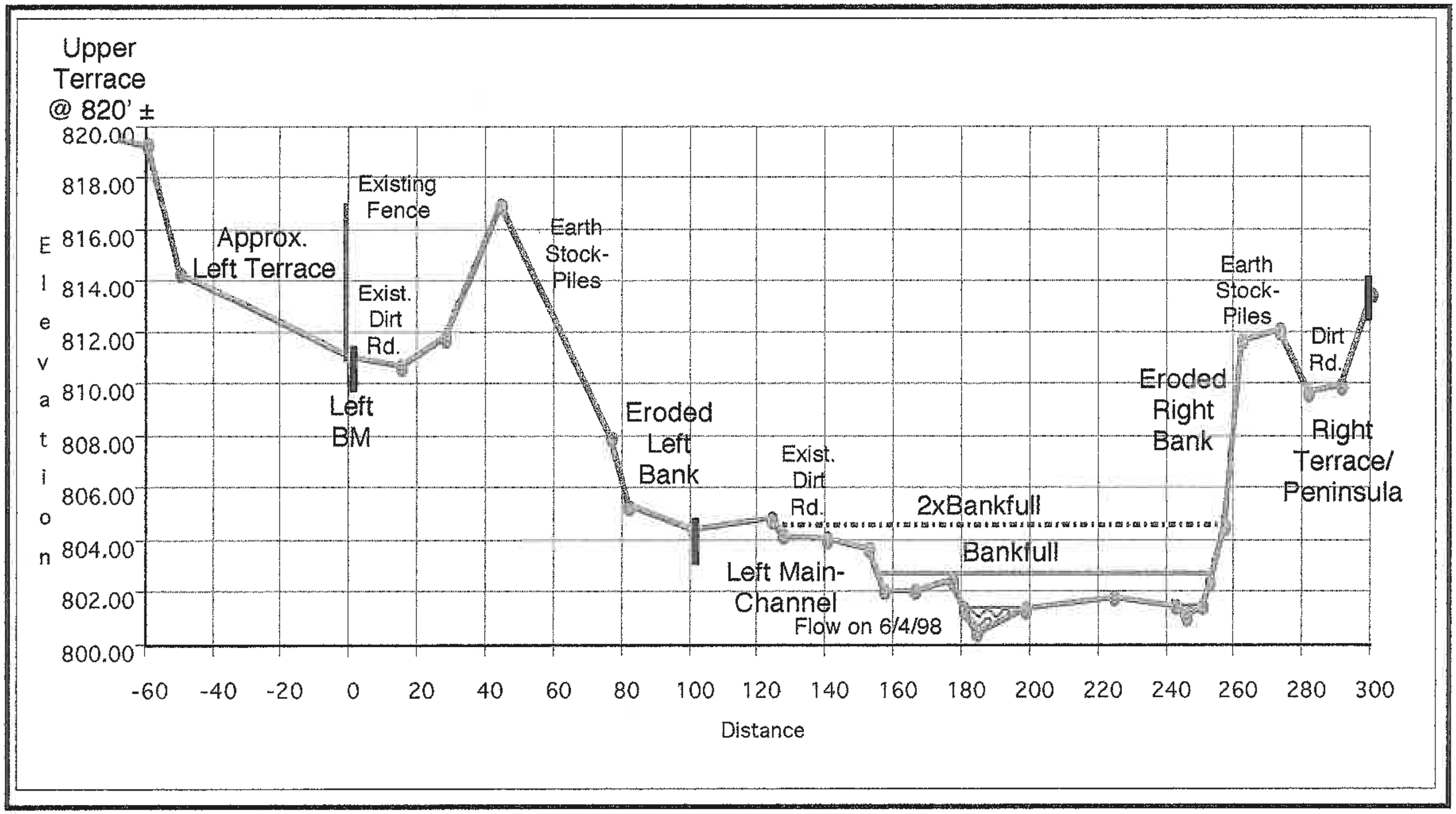
Cross-Section, Atas. Creek 5+00
814.00
813.00
812.00
811.00
810.00
809.00
808.00
807.00
806.00
805.00
804.00
803.00
802.00
801.00
800.00
799.00
Elevation
-160 -140 -120 -100 -80 -60 -40 -20 0 20 40 60 80 100 120 140 160 180 200
Distance

Cuesta College Course # 188.200
Assisted by AmeriCorps
and California Conservation Corps

In cooperation with the Atascadero
Mutual Water Company

Cross-Section Atascadero Creek
800 Feet from Confluence of Salinas River
Spring 1998 Survey

View Looking
Downstream



Atascadero Creek
STREAM CHANNEL
MORPHOLOGICAL ANALYSIS

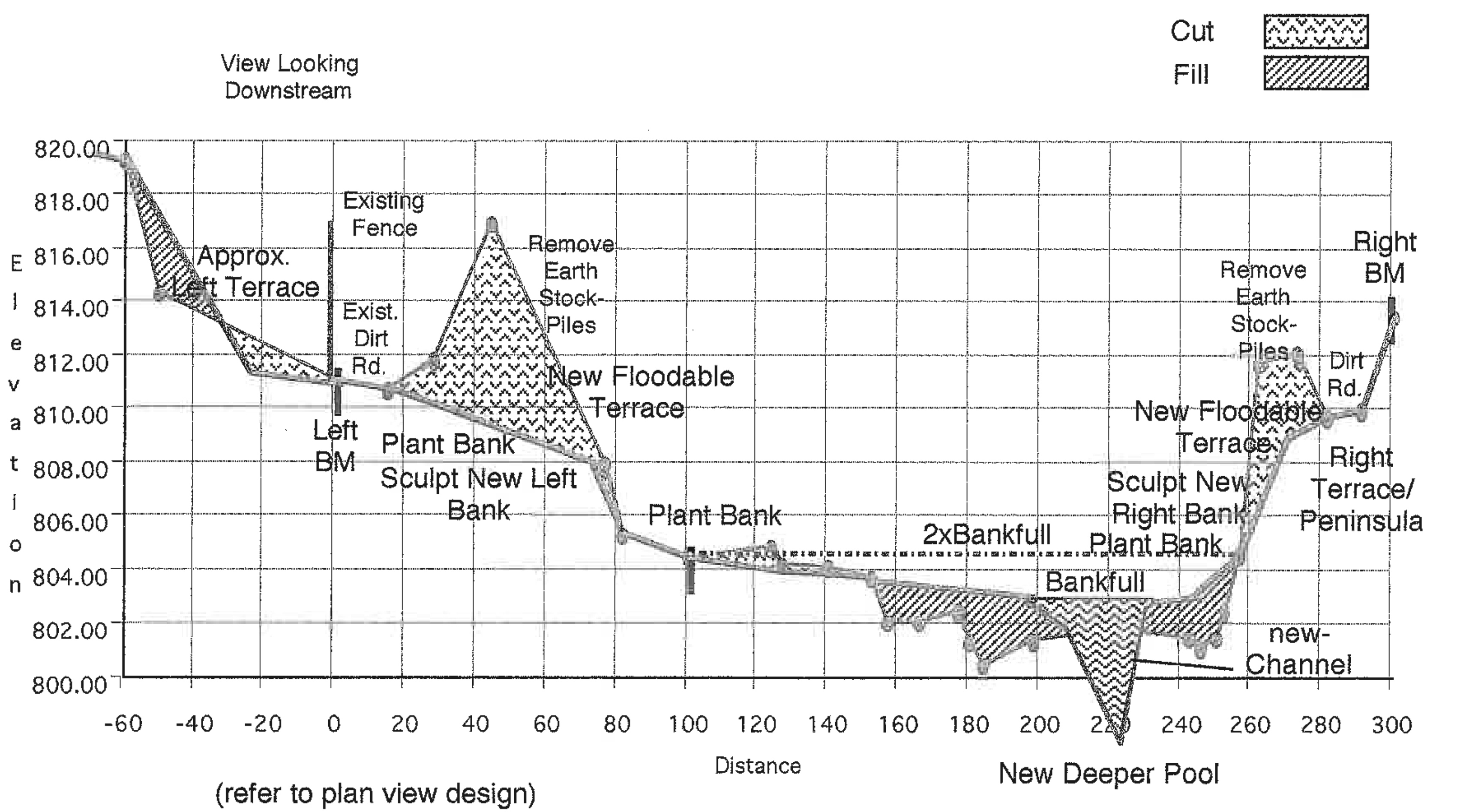
Upper Salinas-Las Tablas
Resource Conservation District

Cue... Colleg... Cours... 188...
Assisted by AmeriCorps
and California Conservation Corps

...cooperation with the Atascadero
Mutual Water Company

Cross-Section Atascadero Creek
800 Feet from Confluence of Salinas River
Stream Channel Project Solution 1B

View Looking
Downstream

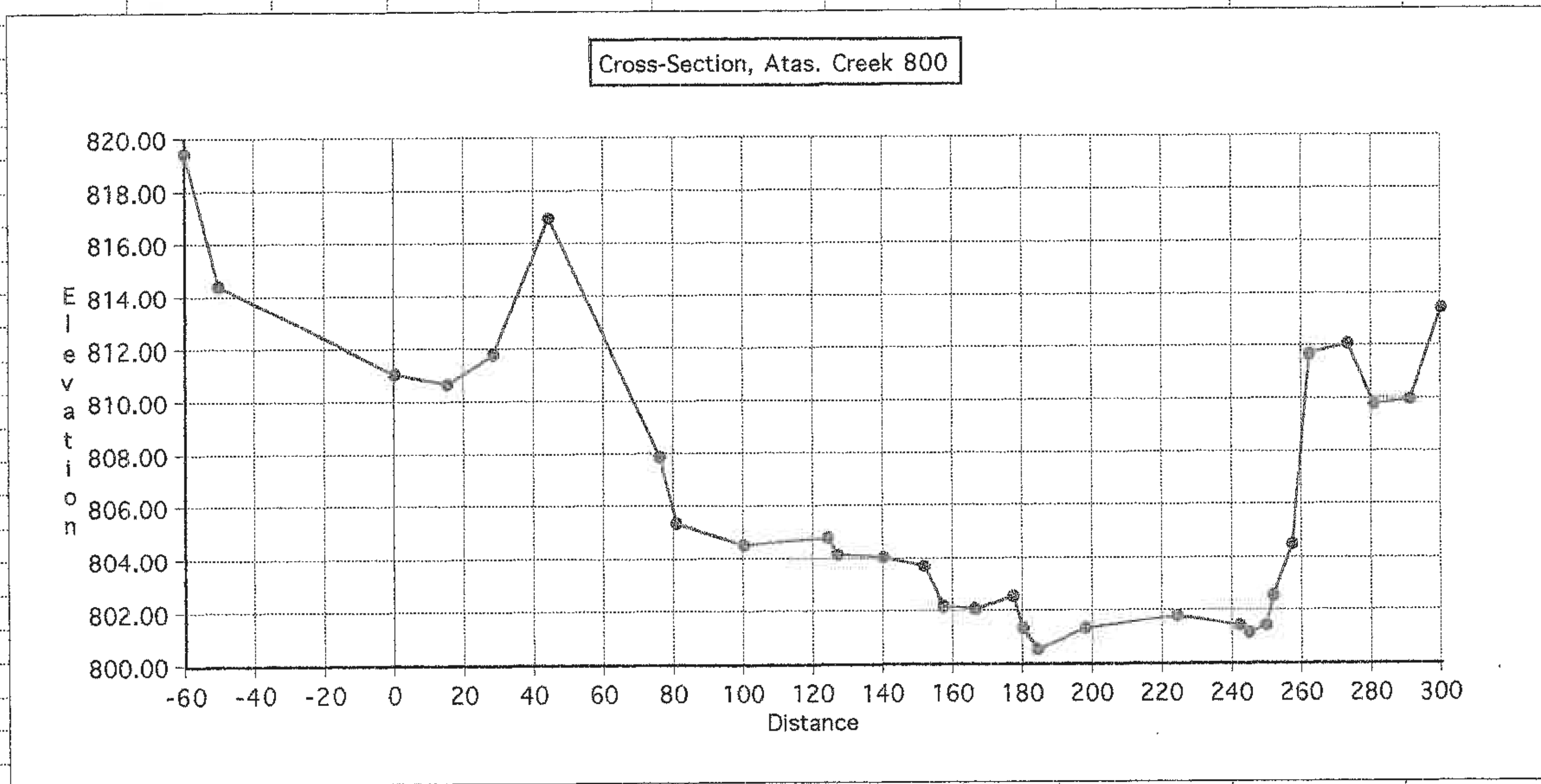


Atascadero Creek
STREAM CHANNEL PROPOSED PROJECT REHABILITATION

Phase 1 Channel bank
Re-grading completed by
Atascadero Mutual Water
Co.

Upper Salinas-Las Tablas
Resource Conservation District

	A	B	C	D	E	F	G	H	I	J	K
1			Atascadero Creek Cross-Section 800								
2											
3	Distance	Ground	Reading	Bkf	Bench Mark	BM	Level	BM			
4	from Left BM.	Elev.	Section			Reading	Elev.	BS			
5	-60	819.41	-2				817.41		Elev. Left Upper Terrace ±		
6	-50	814.41	3				817.41				
7	0	811.09	6.32		811.46	5.95	817.41		Top of plastic BM near fence post.		
8	15	810.74	6.67				817.41				
9	28	811.83	5.58				817.41				
10	44	816.99	0.42				817.41				
11	76	807.95	9.46		815.72	1.69	817.41				
12	81	805.38	12.03				817.41				
13	100	804.56	2.16		804.71	12.7	806.72		Top of plastic BM @ 100 ft.		
14	124	804.83	1.89				806.72	2.68	Cottonwood burl TBM: 804.04		
15	127	804.20	2.52				806.72		806.30= metal stake elev. (Reading 0.42)		
16	140	804.13	2.59				806.72		806.30+11.11 reading = 817.41 elev. level		
17	152	803.69	3.03				806.72				
18	157	802.18	4.54				806.72				
19	166	802.07	4.65				806.72				
20	177	802.53	4.19	bkf			806.72				
21	180	801.38	5.34				806.72				
22	184	800.51	6.21				806.72				
23	198	801.38	5.34				806.72				
24	224	801.83	4.89				806.72				
25	242	801.45	5.27				806.72				
26	245	801.16	5.56				806.72				
27	250	801.45	5.27				806.72				
28	252	802.52	4.2	bkf			806.72				
29	257	804.59	2.13				806.72				
30	262	811.70	5.71				817.41				
31	273	812.08	5.33				817.41				
32	281	809.81	7.6				817.41				
33	291	810.00	7.41				817.41				
34	300	813.47	3.94		814.01	3.4	817.41		Right Plastic BM: 814.01		
35											
36											
37											

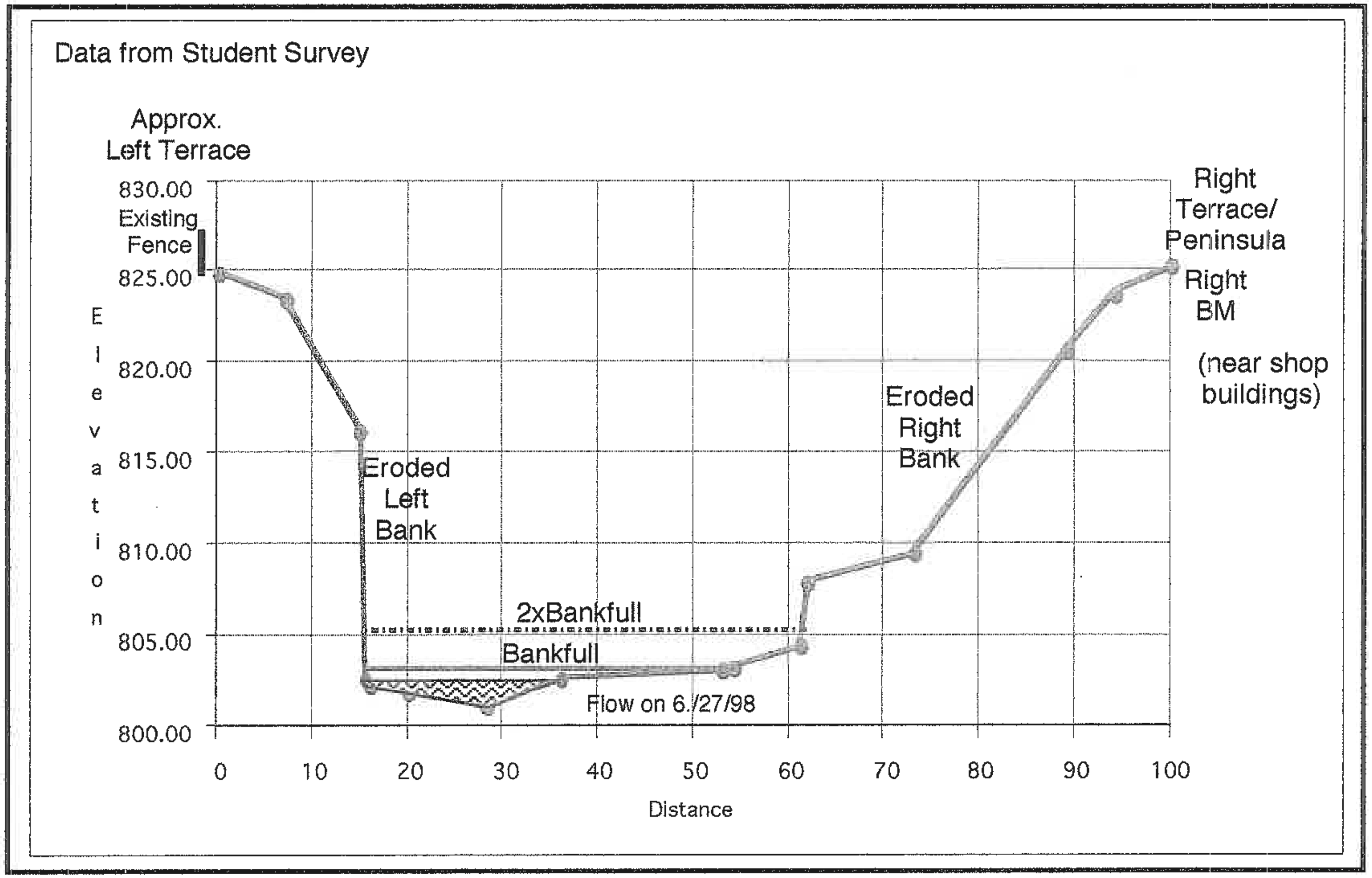

Cross-Section, Atas. Creek 800
820.00
818.00
816.00
814.00
812.00
810.00
808.00
806.00
804.00
802.00
800.00
Elevation
-60 -40 -20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Distance

Cu... Coll... Cour... 118...
Assisted by AmeriCorps
and California Conservation Corps

...n cooperat... with ...tascadero
Mutual Water Company

Cross-Section Atascadero Creek
1,425 Feet from Confluence of Salinas River
Summer 1998 Survey

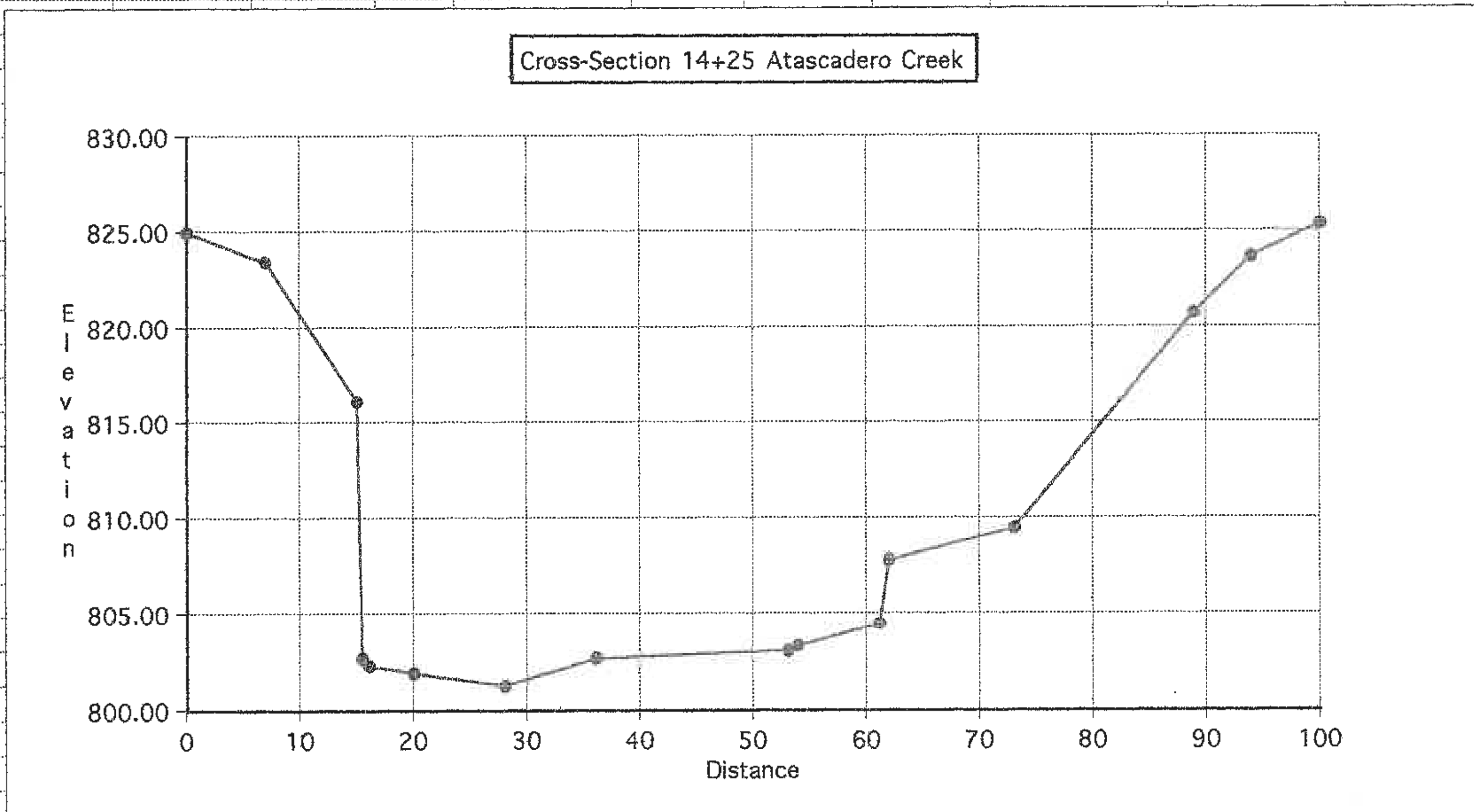
View Looking
Downstream



Atascadero Creek
STREAM CHANNEL
MORPHOLOGICAL ANALYSIS

Upper Salinas-Las Tablas
Resource Conservation District

	A	B	C	D	E	F	G	H	I	J	K
1			Atascadero Creek Cross-Section 1,425								
2											
3	Distance	Ground	Reading	Bkf	Bench Mark	BM	Level	BM			
4	from Left BM.	Elev.	Section			Reading	Elev.	BS			
5					804.71		808.04	3.33	Top of plastic BM @ 100 ft., 8+00 x-section		
6							808.04	3.57	Ground-elevation at BM above		
7					804.69	3.35	808.04	20.88	Temporary BM, log		
8	0	824.95	0.62		825.3	0.27	825.57		Top of plastic BM 1 ft. from corner fence post.		
9	7	823.42	2.15				825.57		Elev. edge Left Upper Terrace ±		
10	15	816.17	9.4			5.95	825.57				
11	15.5	802.65	22.92				825.57				
12	16	802.25	23.32				825.57				
13	20	801.90	23.67				825.57				
14	28	801.26	24.31				825.57				
15	36	802.65	22.92				825.57				
16	53	803.07	22.5			1.69	825.57				
17	54	803.35	22.22				825.57				
18	61	804.52	21.05		812.87	12.7	825.57				
19	62	807.88	17.69				825.57				
20	73	809.44	16.13				825.57				
21	89	820.73	4.84				825.57				
22	94	823.74	1.83				825.57				
23	100	825.41	0.16		825.57		825.57		Right plastic BM		
24											
25											
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											

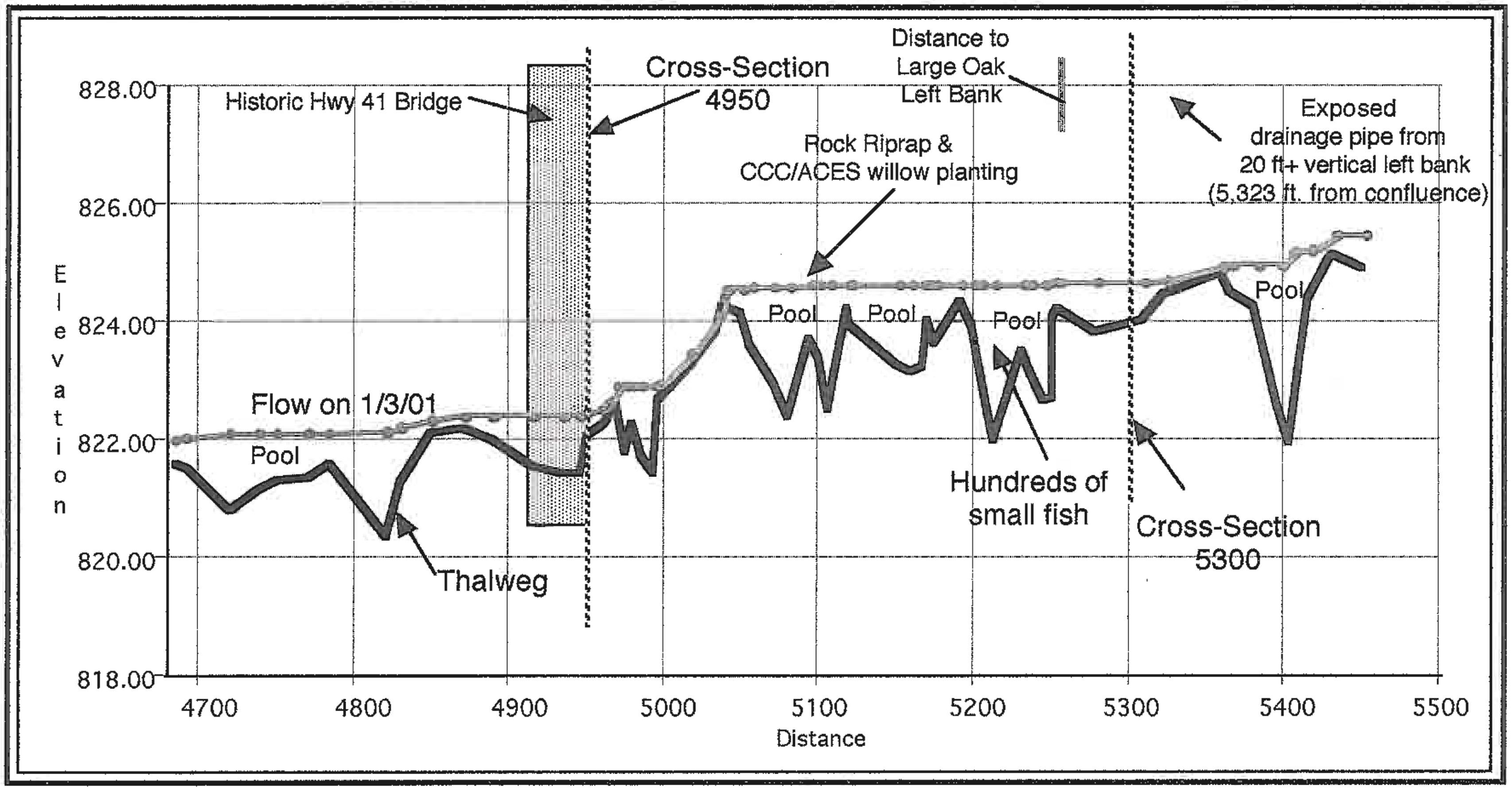


Cross-Section 14+25 Atascadero Creek
Elevation
830.00
825.00
820.00
815.00
810.00
805.00
800.00
0
10
20
30
40
50
60
70
80
90
100
Distance

Atascadero Creek Channel Diagrams and Spreadsheets
Reach 4,685-5,450 feet from confluence with Salinas River

Assisted by
AmeriCorps

Atascadero Creek Longitudinal Profile
4,685-5,450 Feet (approx.) Upstream from Confluence with Salinas River



Data from 1/3/01-1/4/03 surveys

Atascadero Creek
STREAM CHANNEL
MORPHOLOGICAL ANALYSIS

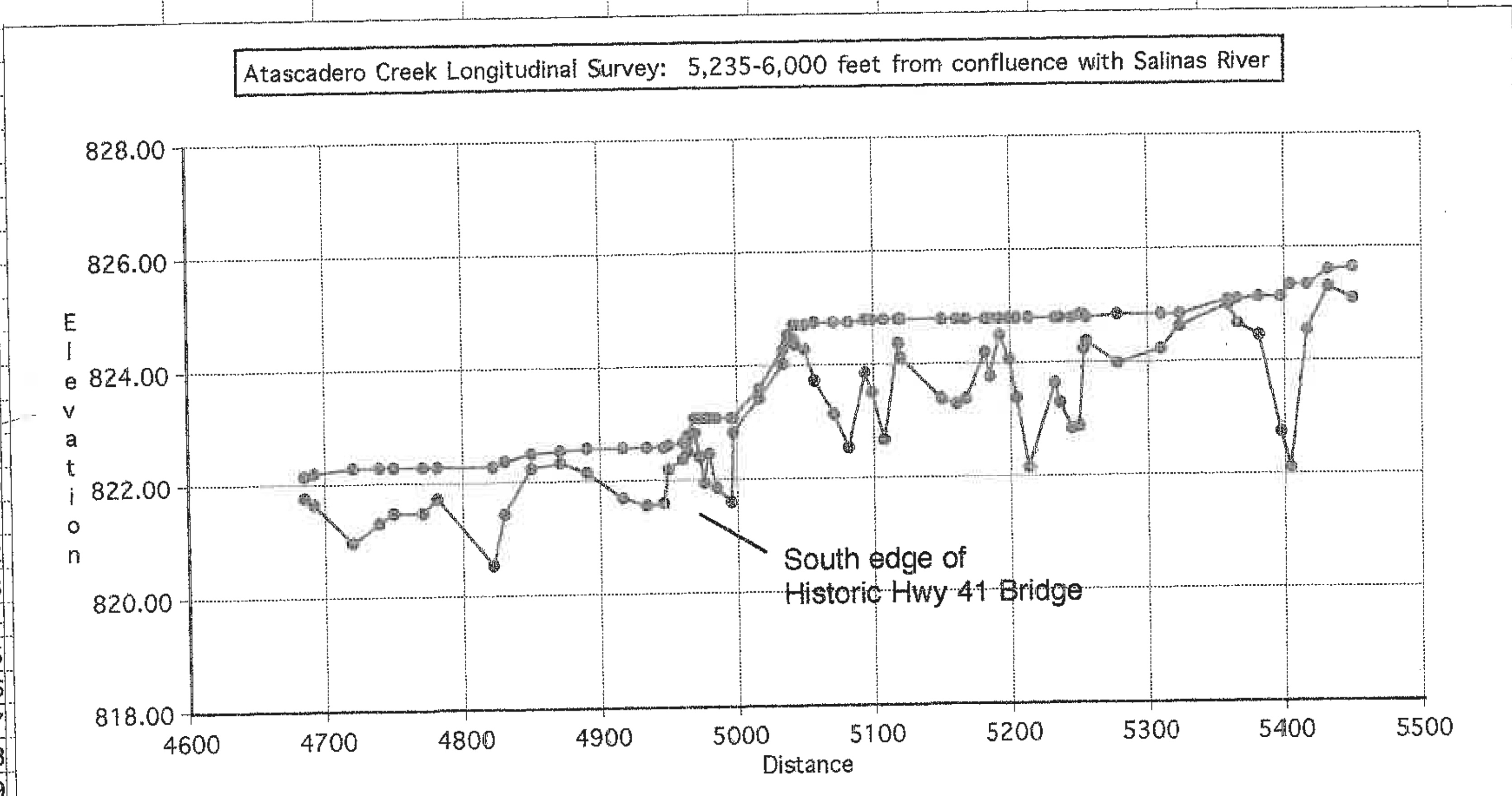
Prepared for
State Department of Fish and Game &
State Water Resources Control Bd.

Upper Salinas-Las Tablas
Resource Conservation District

	A	B	C	D	E	F	G	H	I	J
1		Atascadero Creek Longitudinal Morphological Survey								
2										
3	GENERAL LOCATION:			4,685 to 5,450 feet upstream from confluence with Salinas River						
4				Downstream and upstream of historic Hwy 41 Bridge						
5	BASIS FOR BEGINNING DISTANCE:			Based on 1981 Army Corps FEMA Flood Longitudinal Survey						
6				See Sheet 23-A						
7	STUDY PREPARED FOR:			USLT-RCD						
8	SURVEY TEAM:			D. J. Funk, Marti Johnson						
9	OTHERS ASSISTING:			CCC Crew: Paul Corsi & Stacy Smith; Data Entry and Graphing						
10	DATE(S) OF SURVEY:			January 3-4, 2001						
11	GENERAL:	All distances in ft. Beginning elevation estimated from 1986 City aerial photo/topographic maps.								
12		Benchmark elevation of 826.78 ft (orange dot on boulder, Rt bank)								
13		At distance 4830 Bkf Elev. is 824.45. (Level Reading 8.22 ft)								
14		South edge of Historic Hwy 41 Bridge estimated at 4,950 feet from confluence with Salinas River								
15		B.M. pins are estimated. View orientation: downstream.								
16	TERMS:	B.M.=Bench Mark, T.W.=Thalweg, W.F.=Water Surface, Bkf=Bankfull, B.P.=Bank Pin								
17										
18	Distance	Thalweg	Water	Reading	Reading	B M	Level			
19	Salinas R.	Elev.	Surface	TW	WS		Elev.	Notes		
20	4685	821.77	822.18	10.90	10.49		832.67	Active flow 16 ft wide		
21	4692	821.67	822.23	11.00	10.44		832.67	Active flow 18 ft wide		
22	4719	820.96	822.29	11.71	10.38		832.67			
23	4738	821.30	822.29	11.37	10.38		832.67			
24	4750	821.48	822.29	11.19	10.38		832.67			
25	4771	821.50	822.30	11.17	10.37		832.67	Active flow 14 ft wide		
26	4781	821.75	822.30	10.92	10.37		832.67			
27	4821	820.54	822.31	12.13	10.36		832.67			
28	4830	821.43	822.39	11.24	10.28		832.67	Active flow 13 ft wide; Bkf width 23 ft (photo)		
29	4850	822.27	822.51	10.40	10.16		832.67			
30	4870	822.36	822.57	10.31	10.10		832.67	Active flow 18 ft wide		
31	4889	822.15	822.58	10.52	10.09		832.67			
32	4915	821.71	822.58	10.96	10.09		832.67			
33	4934	821.58	822.58	11.09	10.09		832.67			
34	4945	821.61	822.58	11.06	10.09		832.67	Under bridge; boulders,silt,gravel,sand,cobble		
35	4950	822.23	822.64	15.46	15.05	826.78	837.69	At bridge-S side; boulders; end of riffle, begin pool		
36	4959	822.40	822.70	15.29	14.99		837.69	- BM Reading 10.91; BM BS 5.89		

	A	B	C	D	E	F	G	H	I	J
37	4963	822.49	822.79	15.20	14.90		837.69			
38	4969	822.84	823.09	14.85	14.60		837.69	End of pool; begin riffle		
39	4972	822.42	823.09	15.27	14.60		837.69	Flat water surface		
40	4975	821.97	823.09	15.72	14.60		837.69			
41	4979	822.45	823.09	15.24	14.60		837.69			
42	4985	821.89	823.09	15.80	14.60		837.69	Middle of pool		
43	4994	821.60	823.10	16.09	14.59		837.69	Deepest part of pool		
44	4997	822.86	823.11	14.83	14.58		837.69	End of riffle; begin pool		
45	5016	823.44	823.63	14.25	14.06		837.69	Banks mostly berry plants & trees (oaks, etc)		
46	5034	824.06	824.29	13.63	13.40		837.69	Cobbles in stream at 1080-1090 ft		
47	5037	824.44	824.57	13.25	13.12		837.69			
48	5040	824.45	824.71	13.24	12.98		837.69			
49	5042	824.39	824.72	13.30	12.97		837.69	End of pool		
50	5050	824.31	824.74	13.38	12.95		837.69			
51	5056	823.76	824.78	13.93	12.91		837.69			
52	5071	823.16	824.78	14.53	12.91		837.69			
53	5081	822.56	824.78	15.13	12.91		837.69			
54	5093	823.88	824.79	13.81	12.90		837.69	Clay & Silt		
55	5099	823.54	824.79	14.15	12.90		837.69			
56	5107	822.68	824.81	15.01	12.88		837.69			
57	5118	824.39	824.81	13.30	12.88		837.69	End rock structure & CCC/ACES willow planting -		
58	5120	824.14	824.81	13.55	12.88		837.69			on dirt plug
59	5150	823.42	824.81	14.27	12.88		837.69	Start of dirt plug; Boulder rip-rap left bank		
60	5159	823.30	824.81	14.39	12.88		837.69	Difficulty walking--mucky bottom		
61	5167	823.40	824.81	14.29	12.88		837.69	Mucky bottom		
62	5180	824.20	824.81	13.49	12.88		837.69			
63	5184	823.78	824.81	13.91	12.88		837.69	Lumpy bottom in mucky piles		
64	5191	824.52	824.81	13.17	12.88		837.69			
65	5199	824.09	824.81	13.60	12.88		837.69			
66	5204	823.40	824.81	14.29	12.88		837.69	Beginning of rock rip-rap		
67	5212	822.18	824.81	15.51	12.88		837.69	Hundreds of small fish		
68	5231	823.67	824.81	14.02	12.88		837.69			
69	5235	823.34	824.81	14.35	12.88		837.69			
70	5244	822.87	824.81	14.82	12.88		837.69			
71	5250	822.89	824.83	14.80	12.86		837.69	Hundreds of small fish		
72	5252	824.25	824.83	13.44	12.86		837.69	Large oak on left bank/left meander turn		
73	5255	824.40	824.82	13.29	12.87		837.69	Oak tree roots undermined		

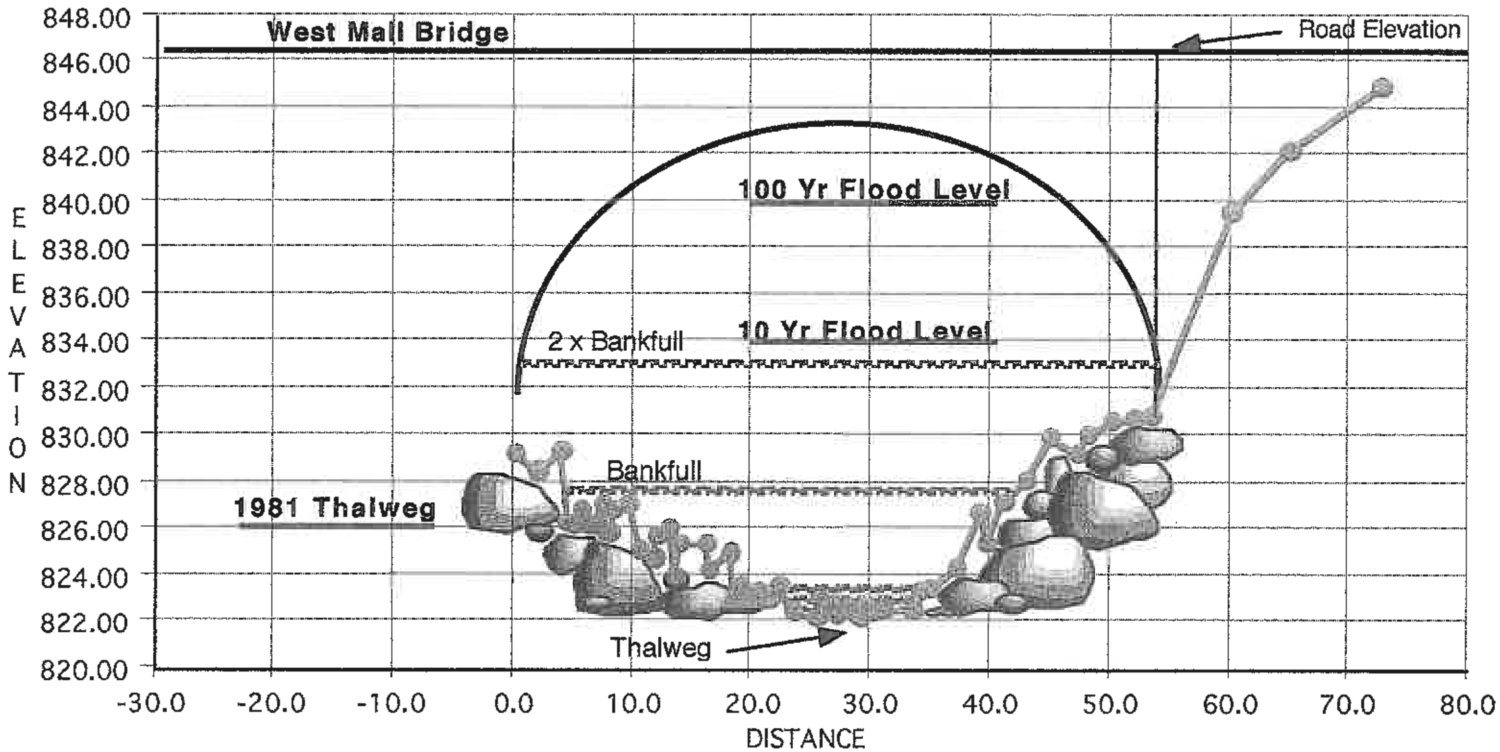
	A	B	C	D	E	F	G	H	I	J
74	5278	824.00	824.84	13.69	12.85		837.69	Exposed roots tagged at 1323 ft		
75	5308	824.26	824.84	13.43	12.85		837.69			
76	5323	824.65	824.87	13.04	12.82		837.69	Exposed drainage pipe; 20 ft vertical left bank		
77	5358	825.04	825.10	12.65	12.59		837.69			
78	5365	824.68	825.12	13.01	12.57		837.69			
79	5381	824.46	825.14	13.23	12.55		837.69			
80	5396	822.78	825.14	14.91	12.55		837.69	Pool		
81	5403	822.14	825.35	15.55	12.34		837.69	Pool		
82	5415	824.56	825.37	13.13	12.32		837.69			
83	5431	825.31	825.63	12.38	12.06		837.69			
84	5450	825.12	825.64	12.57	12.05		837.69			
85										
86										



Assisted by AmeriCorps
and California Conservation Corps

Cross-Section Atascadero Creek
Old 41 Bridge
January 2001 Survey

View Looking Downstream



Data from 01/25/01

Distance 4,950 ft. from Salinas R. confluence

Atascadero Creek
STREAM CHANNEL MORPHOLOGICAL ANALYSIS

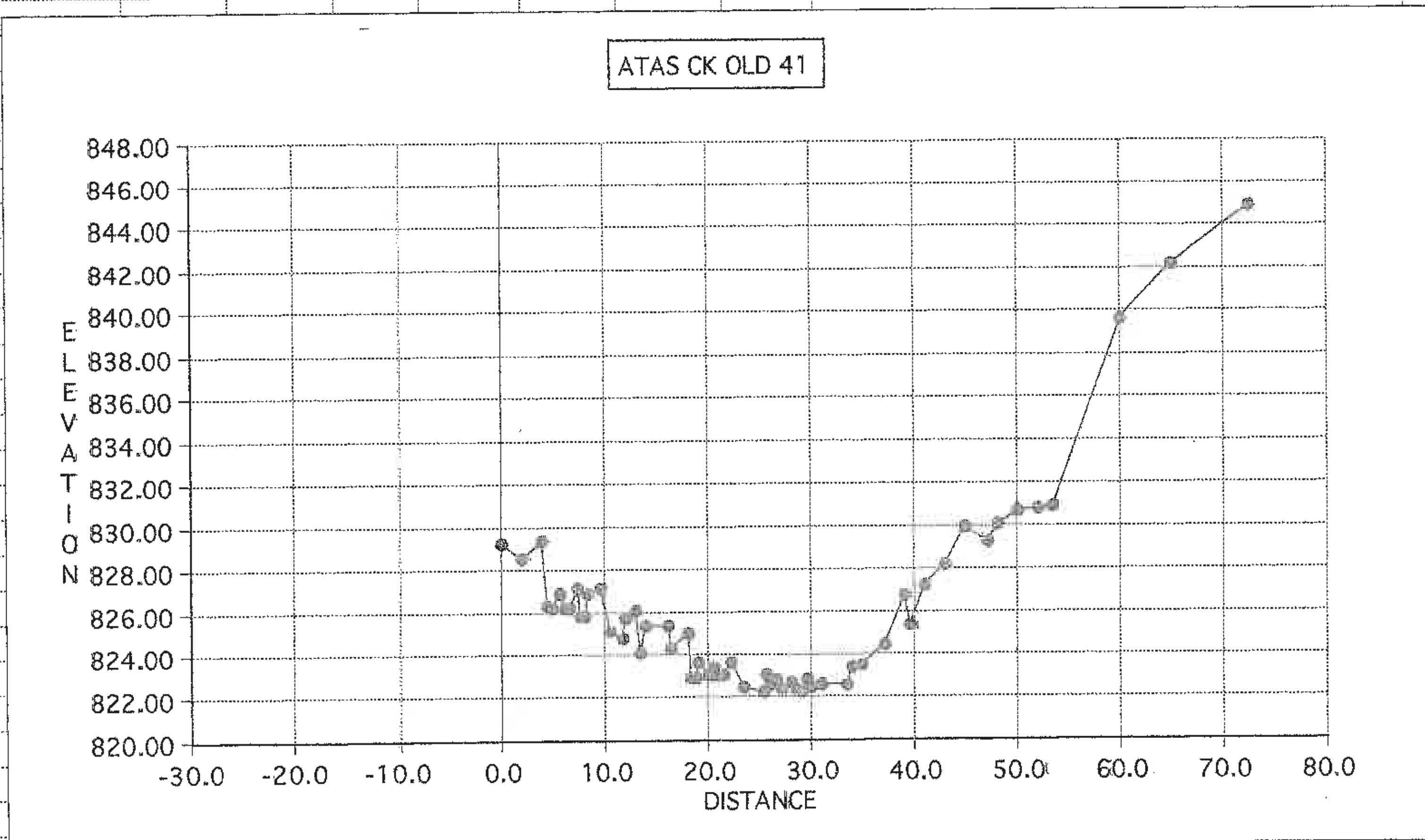
Prepared for
State Department of Fish and Game
State Water Resources Control Bd.

Upper Salinas-Las Tablas Resource Conservation District

	A	B	C	D	E	F	G	H	I	J
1			ATASCADERO CREEK CROSS SECTION 4,950 west of Salinas R.							
2										
3	GENERAL LOCATION:				Atascadero Creek at West Mall, also known as historic Highway 41 bridge					
4	X-SECTION LOCATION:				Directly Under south side of bridge					
5	STUDY PREPARED FOR:				USLT-RCD					
6	SURVEY TEAM:				D. J. Funk, Hillary Peterson, Marti Johnson & Gary Johnston					
7	OTHERS ASSISTING:				CCC Crew: Paul Corsi & Stacy Smith; Data Entry and Graphing					
8	DATE(S) OF SURVEY:				Jan. 25, 01		Clear weather			
9	GENERAL:	All distances in ft. City of Atascadero Engineering Dept. aerial survey used to create beginning elevations.								
10		Elevation of ground level based upon December 20, 1985 aerial survey data.								
11		Elevations tied to tennis court and center of West Mall bridge on 1985 survey.								
12		Distance estimated: 4,950 ft. from confluence with Salinas River based on July 20, 1981 FEMA Flood Insurance Study.								
13		100 year flood = 6625 cfs								
14		Flood level elevation estimated = 100 yr at 840.00 ft, 10 yr at 834.00 ft. 1981 FEMA study.								
15	X-SECTION INFO.:				Beginning distance measured from left B.M. to right B.M. Points beyond					
16		B.M. pins are estimated. View orientation: downstream.								
17	TERMS:	B.M.=Bench Mark, T.W.=Thalweg, W.F.=Water Surface, bkf=Bankfull, B.P.=Bank Pin								
18	ENTRENCHMENT RATIO:			54/38 = 1.42		< 1.4 = Entrenched (A, G & F Stream types)				
19		1.4 - 2.2 = Mod. Entrenched (B Streams), > 2.2 = Slightly Entrenched (E & C Streams)								
20										
21	Distance	Ground	Reading	Bkf	Bench	B M	Level	B S	Comments	
22		Elev.	Section		Mark	Reading	Elev.			
23										
24	0.0	829.29	6.80		829.29	6.80	836.09		Tied to 1985 aerial/Topo survey	
25	2.0	828.53	7.56				836.09			
26	4.0	829.45	6.64				836.09			
27	4.5	826.33	9.76				836.09			
28	4.9	826.28	9.81				836.09			
29	5.6	826.97	9.12				836.09			
30	6.0	826.28	9.81				836.09			
31	6.7	826.23	9.86				836.09			
32	7.4	827.12	8.97				836.09			
33	7.6	825.83	10.26				836.09			
34	8.0	825.94	10.15				836.09			
35	8.4	826.97	9.12				836.09			
36	9.4	827.12	8.97				836.09			

	A	B	C	D	E	F	G	H	I	J
37	10.4	825.12	10.97				836.09			
38	11.8	824.81	11.28				836.09			
39	12.0	825.71	10.38				836.09			
40	13.0	826.16	9.93				836.09			
41	13.4	824.13	11.96				836.09			
42	14.0	825.41	10.68				836.09			
43	16.0	825.41	10.68				836.09			
44	16.4	824.41	11.68				836.09			
45	18.0	825.07	11.02				836.09		Boulders	
46	18.4	822.91	13.18				836.09			
47	18.7	822.90	13.19				836.09			
48	19.0	823.65	12.44				836.09			
49	20.0	823.09	13.00				836.09			
50	20.5	823.38	12.71				836.09			
51	20.6	823.10	12.99				836.09			
52	21.0	823.09	13.00				836.09			
53	21.5	823.08	13.01				836.09			
54	22.3	823.65	12.44				836.09		Water Surface Level Jan. 25, 2001	
55	23.5	822.44	13.65				836.09			
56	25.3	822.22	13.87				836.09			
57	25.5	823.04	13.05				836.09			
58	26.0	822.53	13.56				836.09			
59	26.5	822.80	13.29				836.09			
60	27.0	822.38	13.71				836.09			
61	28.0	822.72	13.37				836.09			
62	28.5	822.33	13.76				836.09			
63	29.0	822.18	13.91				836.09		Thalweg	
64	29.5	822.80	13.29				836.09			
65	30.0	822.45	13.64				836.09			
66	31.0	822.53	13.56				836.09			
67	33.5	822.54	13.55				836.09			
68	34.0	823.44	12.65				836.09			
69	35.0	823.58	12.51				836.09		Water Surface Level Jan. 25, 2001	
70	37.0	824.52	11.57				836.09			
71	39.0	826.78	9.31		826.78	9.31	836.09	9.31	Benchmark Boulder in Channel (orange dot)	
72	39.5	825.36	10.73				836.09			
73	41.0	827.24	8.85				836.09			

	A	B	C	D	E	F	G	H	I	J
74	43.0	828.28	7.81				836.09			
75	45.0	829.99	6.1				836.09			
76	47.0	829.32	6.77				836.09		Boulders	
77	48.0	830.12	5.97				836.09			
78	50.0	830.70	5.39				836.09			
79	52.0	830.85	5.24				836.09			
80	53.5	831.00	5.09		831.70	4.39	836.09			
81	60.0	839.64	7.43				847.07			
82	65.0	842.27	4.80				847.07			
83	72.5	844.96	2.11				847.07			



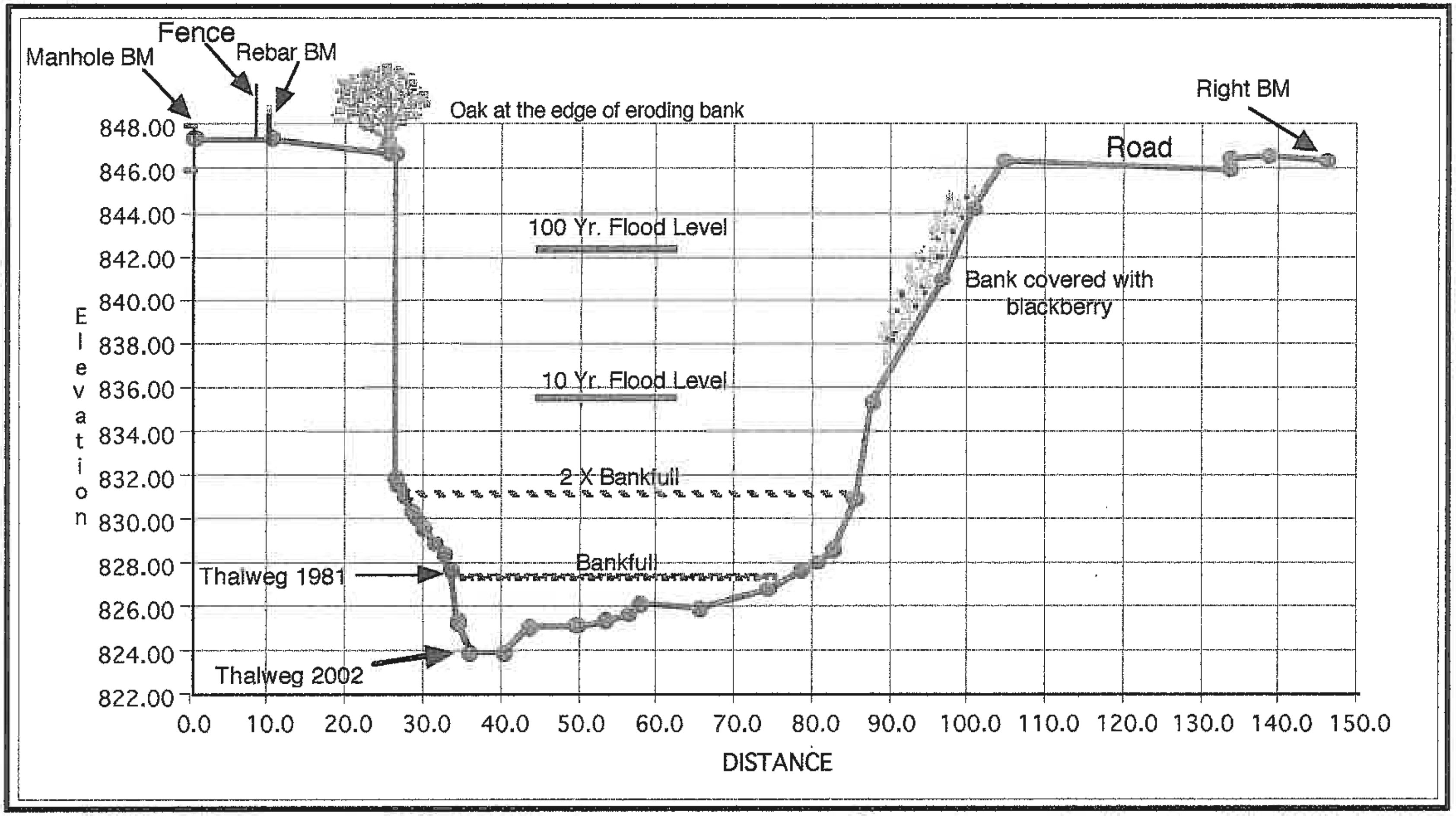
01/24/01 Atascadero Creek X-Section: 4,950 feet from confluence w/ Salinas River (Book 3)

Assisted by AmeriCorps
and California Conservation Corps

Cross-Section Atascadero Creek
350 Feet Upstream from Old 41 Bridge
January 2002 Survey

View Looking Downstream

Data from 01/03/02



Distance 5,300 ft. from
Salinas R. confluence

Atascadero Creek
STREAM CHANNEL
MORPHOLOGICAL ANALYSIS

Prepared for
State Department of Fish and Game
State Water Resources Control Bd.

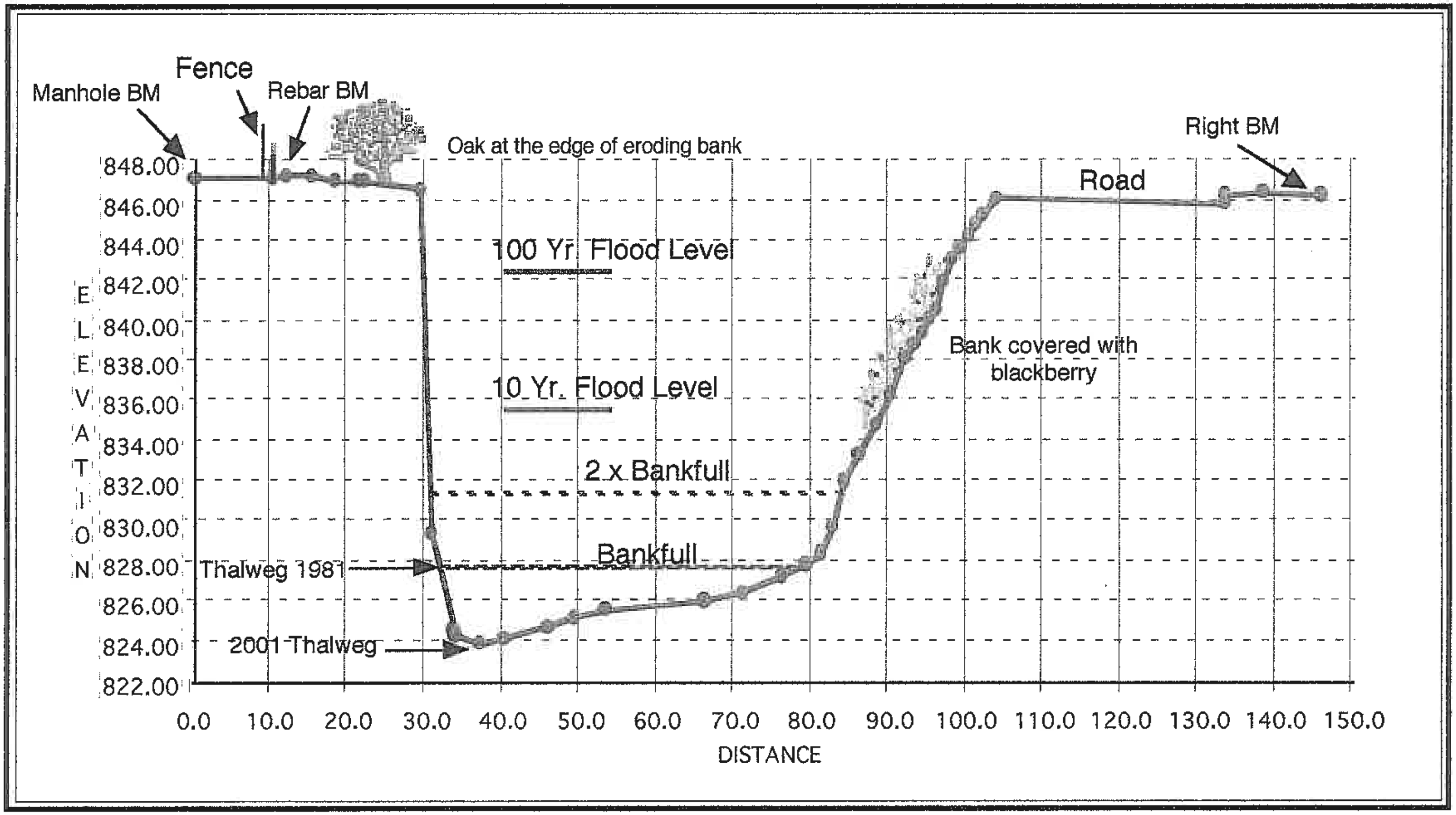
Upper Salinas-Las Tablas
Resource Conservation District

Assisted by AmeriCorps
and California Conservation Corps

Data from 02/07/01

Cross-Section Atascadero Creek
350 Feet Upstream from Old 41 Bridge
February 2001 Survey

View Looking
Downstream



Distance 5,300 ft. from
Salinas R. confluence

Atascadero Creek
STREAM CHANNEL
MORPHOLOGICAL ANALYSIS

Prepared for
State Department of Fish and Game
State Water Resources Control Bd.

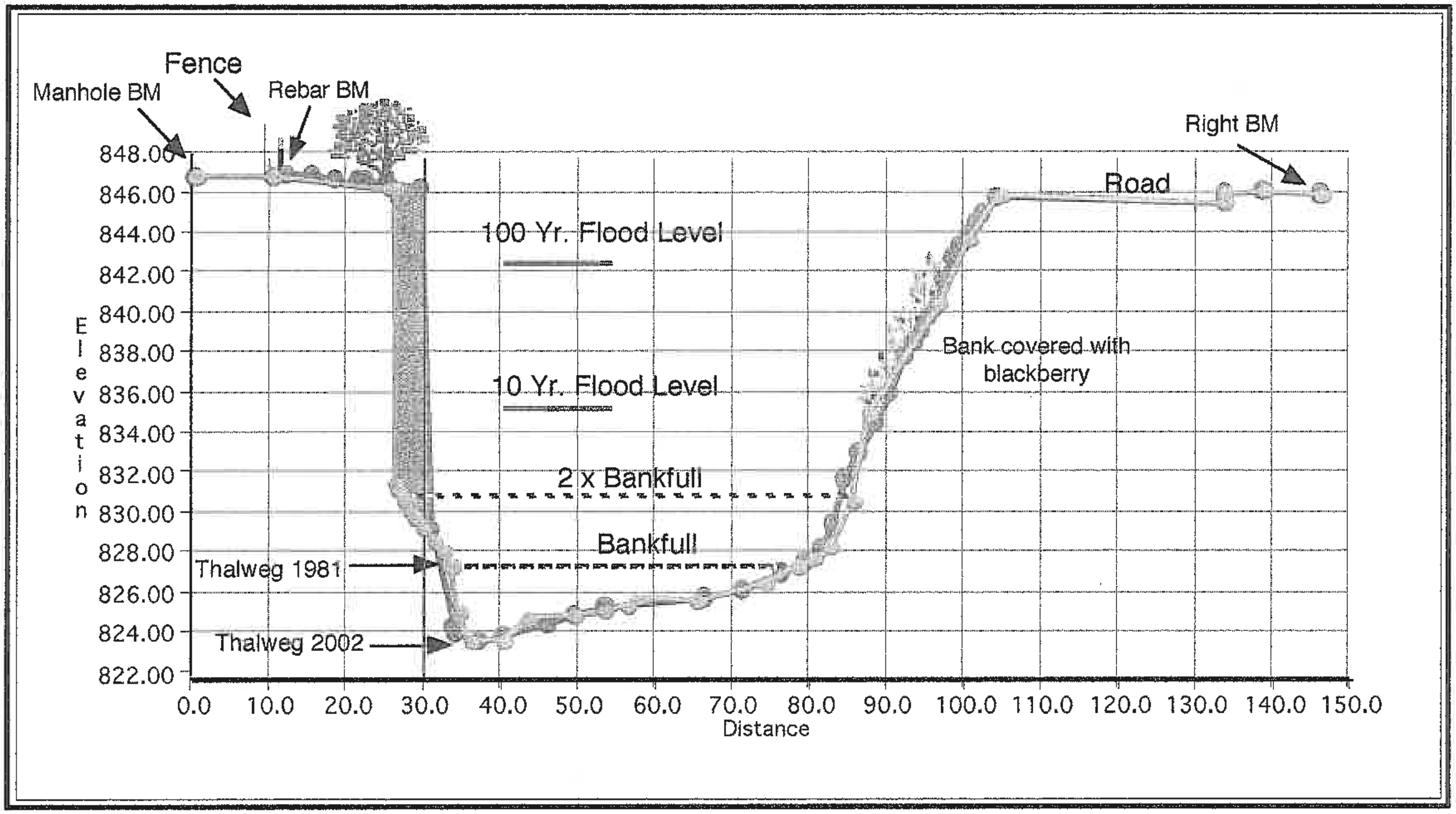
Upper Salinas-Las Tablas
Resource Conservation District

Assisted by AmeriCorps
and California Conservation Corps

Cross-Section Atascadero Creek
350 Feet Upstream from Old 41 Bridge
Comparison 2001 to 2002 Surveys

Data from 02/07/01 and 1/03/02

View Looking Downstream



Eroded Soil from 2/01 to 1/02
Feb 7, 2001
Jan 3, 2002

Distance 5,300 ft. from Salinas R. confluence

Atascadero Creek
STREAM CHANNEL MORPHOLOGICAL ANALYSIS

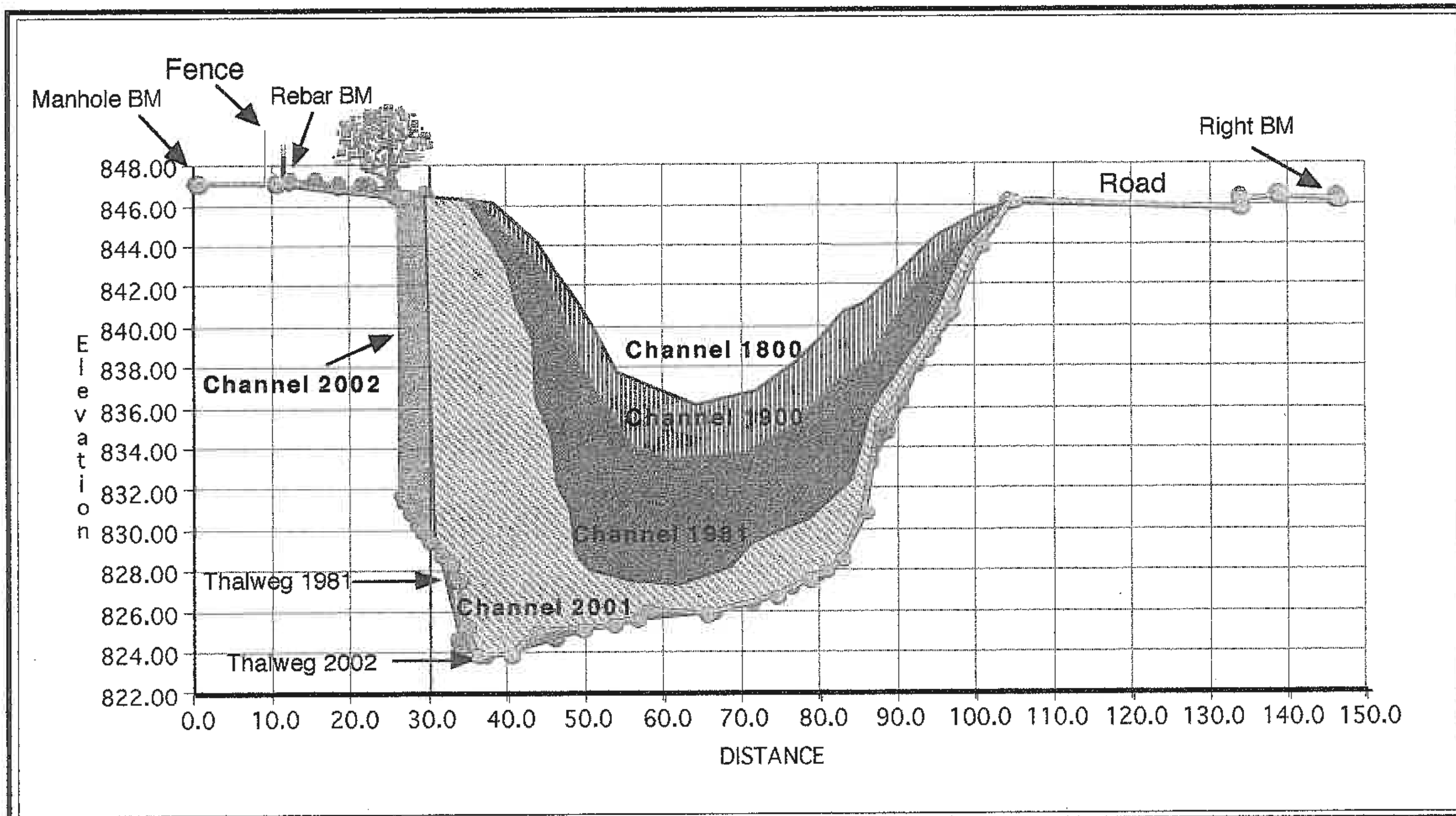
Prepared for
State Department of Fish and Game
State Water Resources Control Bd.

Upper Salinas-Las Tablas Resource Conservation District

Assisted by AmeriCorps
and California Conservation Corps

Estimated Historical Channel Configurations
Atascadero Creek
350 Feet Upstream from Old 41 Bridge

View Looking
Downstream



Distance 5,300 ft. from
Salinas R. confluence

Atascadero Creek
STREAM CHANNEL
MORPHOLOGICAL ANALYSIS

Prepared for
State Department of Fish and Game
State Water Resources Control Bd.

Upper Salinas-Las Tablas
Resource Conservation District

	A	B	C	D	E	F	G	H	I	J
1			ATASCADERO CREEK CROSS SECTION 5,300 west of Salinas R.							
2										
3	GENERAL LOCATION:				Adjacent to Atascadero Jr. High District offices & Santa Ysabel St.					
4	X-SECTION LOCATION:				350 feet South of West Mall bridge (Old Hwy 41).					
5	STUDY PREPARED FOR:				USLT-RCD					
6	SURVEY TEAM:				D. J. Funk, A. Morales, P. Corsi, S. Smith					
7	OTHERS ASSISTING:				CCC Crew: Paul Corsi & Stacy Smith; Data Entry and Graphing					
8	DATE(S) OF SURVEY:				Jan. 3, 2002		Clear weather			
9	GENERAL:	All distances in ft. City of Atascadero Engineering Dept. aerial survey used to create beginning elevations.								
10		Elevation of ground level @ left B.M. 847.29 based on tieing the manhole cover to December 20, 1985 aerial survey.								
11		Elevations tied to tennis court and center of West Mall bridge on 1985 survey.								
12		Distance estimated: 5,300 from confluence with Salinas River based on July 20, 1981 FEMA Flood Insurance Study.								
13		100 year flood = approx 10ft per second and 6625 cfs								
14		Flood level elevation estimated = 100 yr at 843.90 ft, 10 yr at 837.00 ft. 1981 FEMA study.								
15		Bankfull elevation was derived from 2/7/01 cross-section survey at approx 827.50 ft.								
16	X-SECTION INFO.:				Beginning distance measured from left B.M. to right B.M. Points beyond					
17		B.M. pins are estimated. View orientation: downstream.								
18	TERMS:	B.M.=Bench Mark, T.W.=Thalweg, W.F.=Water Surface, bkf=Bankfull, B.P.=Bank Pin								
19	ENTRENCHMENT RATIO:			58/43= 1.35 < 1.4 = Entrenched (A, G & F Stream types)						
20		1.4 - 2.2 = Mod. Entrenched (B Streams), > 2.2 = Slightly Entrenched (E & C Streams)								
21										
22	Distance	Ground	Reading	Bkf	Bench	BM	Level	BS	Comments	
23	Left BM.	Elev.	Section		Mark	Reading	Elev.			
24										
25	0.0	847.29	3.86		847.29		851.15		Center of manhole cover, Elevation 847.29, Team 2 level location	
26	10.0	847.36	3.79		847.66	3.49	851.15		Rebar, benchmark	
27	25	846.65	4.50				851.15			
28	25.9	846.65	4.50				851.15		Top of Bank, End of Team 2 level location	
29	25.8	832.01	0.00				832.01		Begin Team 1 level location	
30	26.0	831.66	0.35				832.01			
31	27.0	831.16	0.85				832.01		Rebar	
32	27.8	830.46	1.55				832.01			
33	28.5	830.16	1.85				832.01			
34	29.5	829.69	2.32				832.01			
35	31.0	829.01	3.00				832.01			
36	32.0	828.56	3.45				832.01			
37	33.0	827.80	4.21				832.01			
38	33.8	825.41	6.60				832.01		Left bank W.F.	

	A	B	C	D	E	F	G	H	I	J
39	34.0	825.52	6.49				832.01			
40	35.5	824.14	7.87				832.01		T.W.	
41	39.6	824.09	7.92				832.01			
42	43.0	825.27	6.74				832.01			
43	49.0	825.34	6.67				832.01			
44	52.8	825.49	6.52				832.01		Right bank W.F.	
45	55.8	825.84	6.17				832.01			
46	57.2	826.33	5.68				832.01			
47	65.0	826.06	5.95				832.01			
48	73.5	826.94	5.07				832.01			
49	78.0	827.81	4.20				832.01			
50	80.0	828.17	3.84				832.01			
51	82.0	828.74	3.27				832.01			
52	84.7	831.09	0.92				832.01		End of Team 1 level location	
53	87.0	835.45	15.70				851.15		Beginning Team 2 level location	
54	96.0	840.97	10.18				851.15			
55	100.0	844.23	6.92				851.15			
56	104.0	846.41	4.74				851.15		Edge of Pavement(Road), End Team 2 level location	
57	133.0	846.04	5.88				851.92		Bottom of Curb	
58	133.1	846.50	5.42				851.92		Top of Curb	
59	138.0	846.61	5.31				851.92			
60	145.5	846.41	5.51				851.92		Benchmark behind shrub across road	
61										
62										
63										
64										
65										
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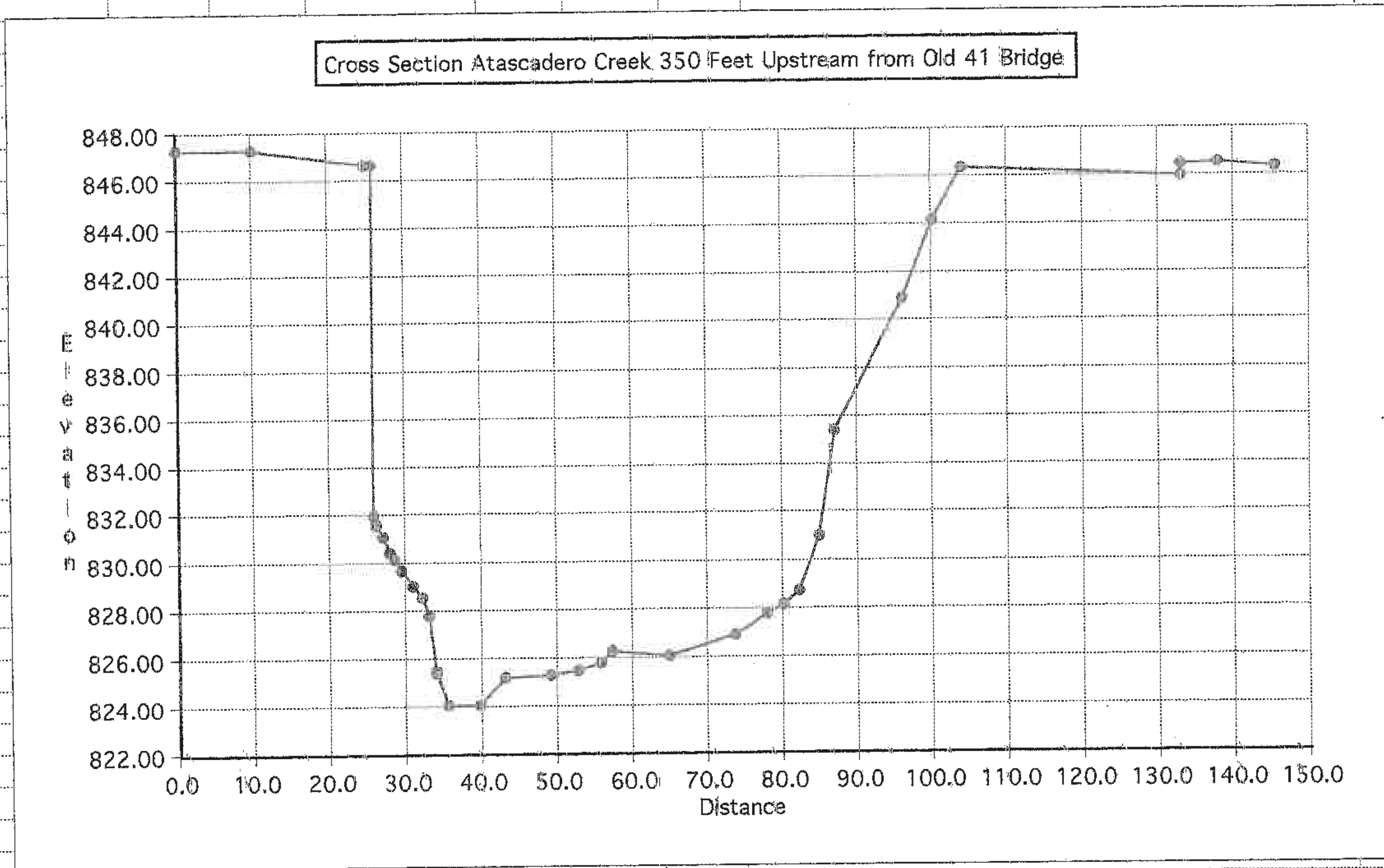
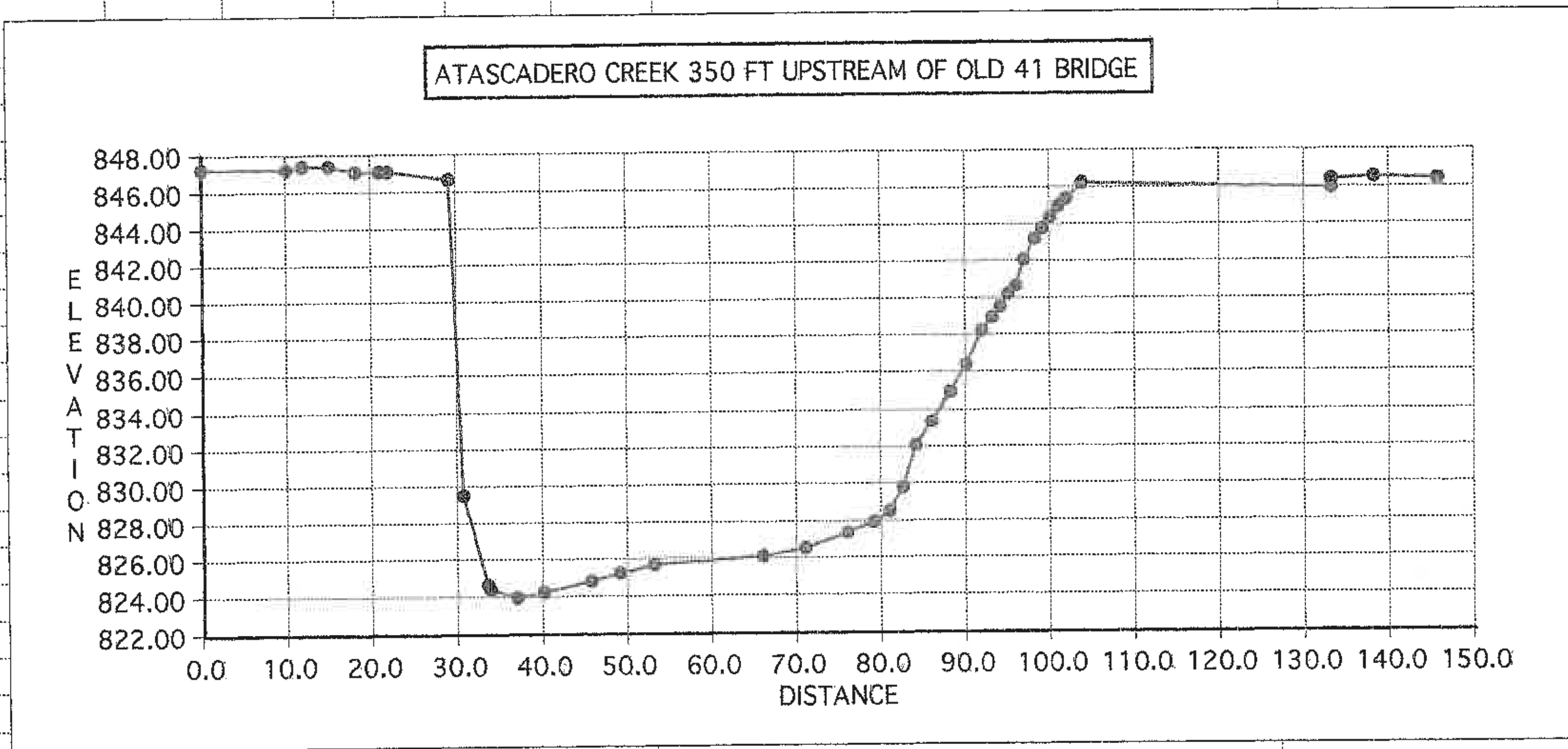

Cross Section Atascadero Creek 350 Feet Upstream from Old 41 Bridge
Elevation
848.00
846.00
844.00
842.00
840.00
838.00
836.00
834.00
832.00
830.00
828.00
826.00
824.00
822.00
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0
110.0
120.0
130.0
140.0
150.0
Distance

	A	B	C	D	E	F	G	H
1	ATASCADERO CREEK CROSS SECTION , 5,300 west of Salinas R.							
2								
3	GENERAL LOCATION:				Adjacent to Atascadero Jr. High District offices & Santa Ysabel St.			
4	X-SECTION LOCATION:				350 feet South of West Mall bridge (Old Hwy 41).			
5	STUDY PREPARED FOR:				USLT-RCD			
6	SURVEY TEAM:				D. J. Funk, Hillary Peterson, Marti Johnson & Gary Johnston			
7	OTHERS ASSISTING:				CCC Crew: Paul Corsi & Stacy Smith; Data Entry and Graphing			
8	DATE(S) OF SURVEY:				Feb. 7th, 01		Clear weather	
9	GENERAL:	All distances in ft. City of Atascadero Engineering Dept. aerial survey used to create beginning elevations.						
10		Elevation of ground level @ left B.M. 847.29 based on tieing the manhole cover to December 20, 1985 aerial survey.						
11		Elevations tied to tennis court and center of West Mall bridge on 1985 survey.						
12		Distance estimated: 5,300 from confluence with Salinas River based on July 20, 1981 FEMA Flood Insurance Study.						
13		100 year flood = approx 10.6 ft per second and 6625 cfs						
14		Flood level elevation estimated = 100 yr at 842.20 ft, 10 yr at 835.50 ft. 1981 FEMA study.						
15	X-SECTION INFO.:				Beginning distance measured from left B.M. to right B.M. Points beyond			
16		B.M. pins are estimated. View orientation: downstream.						
17	TERMS:	B.M.=Bench Mark, T.W.=Thalweg, W.F.=Water Surface, bkf=Bankfull, B.P.=Bank Pin						
18	ENTRENCHMENT RATIO:			54/47= 1.15 < 1.4 = Entrenched (A, G & F Stream types)				
19		1.4 - 2.2 = Mod. Entrenched (B Streams), > 2.2 = Slightly Entrenched (E & C Streams)						
20								
21	Distance	Ground	Reading	B M	B M	Level	Comments	
22	Left BM.	Elev.	Section		Reading	Elev.		
23								
24	0.0	847.29	4.63	847.29		851.92	Center of manhole cover, Elevation 847.29	
25	10.0	847.35	4.57	847.65	4.27	851.92	Redo Back sighting of Benchmark	
26	12.0	847.37	4.55			851.92		
27	15.0	847.37	4.55			851.92		
28	18.0	847.20	4.72			851.92		
29	21.0	847.18	4.74			851.92		
30	22.0	847.15	4.77			851.92		
31	29.0	846.68	5.24			851.92	Vertically Eroded Bank	
32	30.5	829.60	0.56			830.16	Be sure to readjust Back sighting of new Benchmark	
33	33.5	824.75	5.41			830.16	Water Surface	
34	33.6	824.47	5.69			830.16		
35	37.0	823.99	6.17			830.16	Thalweg	
36	40.0	824.32	5.84			830.16		
37	45.5	824.80	5.36			830.16	Water Surface	
38	49.0	825.32	4.84			830.16		

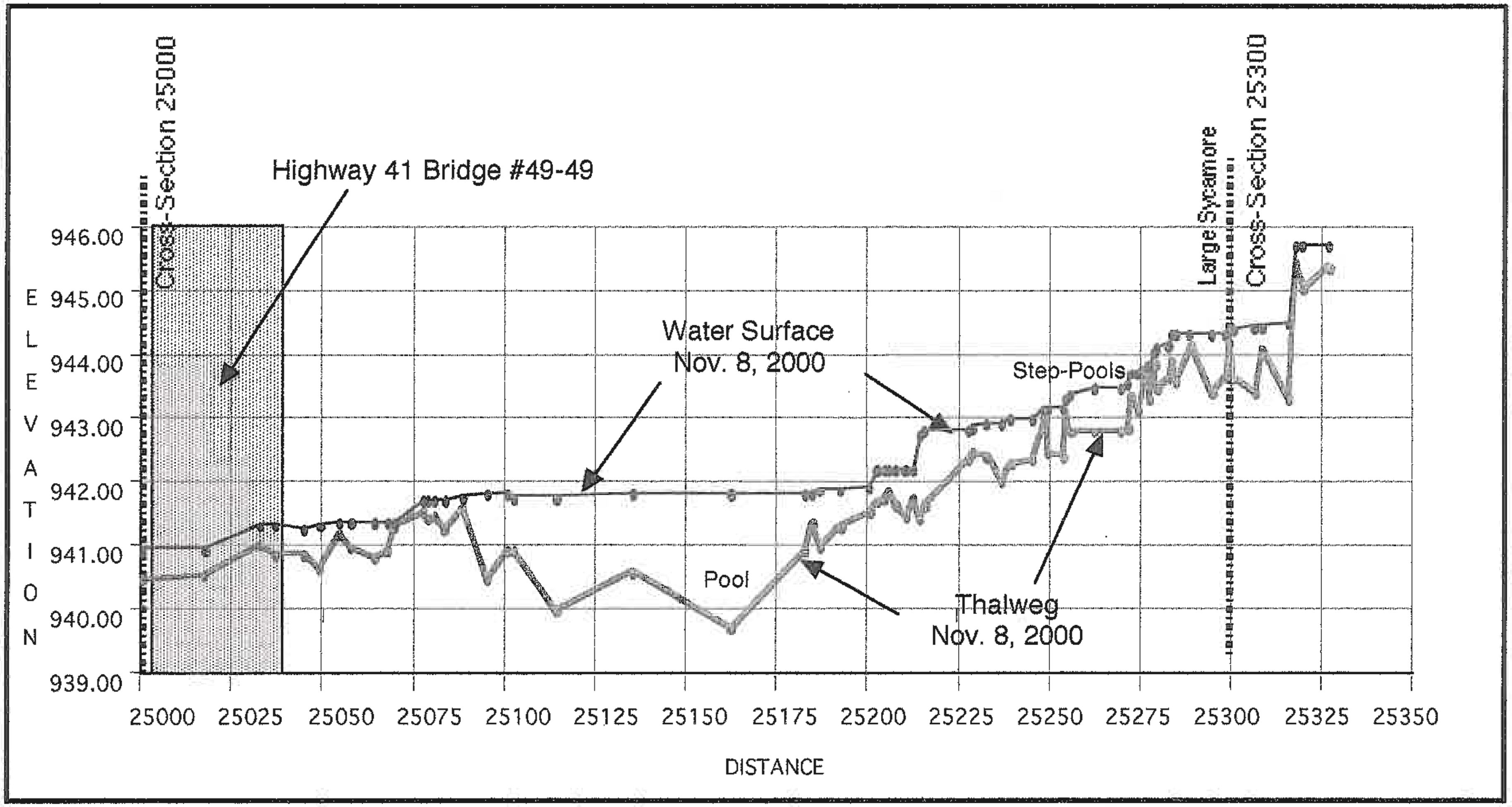
	A	B	C	D	E	F	G	H
39	53.0	825.77	4.39			830.16		
40	66.0	826.08	4.08			830.16		
41	71.0	826.53	3.63			830.16		
42	76.0	827.38	2.78			830.16		
43	79.0	828.03	2.13			830.16	Approx. Bankfull 827.75	
44	81.0	828.64	1.52			830.16		
45	82.5	829.89	22.03			851.92		
46	84.0	832.14	19.78			851.92		
47	86.0	833.37	18.55			851.92		
48	88.0	834.99	16.93			851.92		
49	90.0	836.49	15.43			851.92		
50	92.0	838.23	13.69			851.92		
51	93.0	839.03	12.89			851.92		
52	94.0	839.63	12.29			851.92		
53	95.0	840.27	11.65			851.92		
54	96.0	840.78	11.14			851.92		
55	97.0	842.12	9.80			851.92		
56	98.0	843.27	8.65			851.92		
57	99.0	843.85	8.07			851.92		
58	100.0	844.38	7.54			851.92		
59	101.0	844.97	6.95			851.92		
60	102.0	845.45	6.47			851.92		
61	103.7	846.34	5.58			851.92	Edge of Pavement	
62	133.0	846.04	5.88			851.92	Bottom of Curb	
63	133.1	846.50	5.42			851.92	Top of Curb	
64	138.0	846.61	5.31			851.92		
65	145.5	846.41	5.51			851.92	Benchmark behind shrub across road	
66								
67								
68								
69								
70								
71								
72								
73								
74								
75								
76								


ATASCADERO CREEK 350 FT UPSTREAM OF OLD 41 BRIDGE
ELEVATION
848.00
846.00
844.00
842.00
840.00
838.00
836.00
834.00
832.00
830.00
828.00
826.00
824.00
822.00
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0
110.0
120.0
130.0
140.0
150.0
DISTANCE

Atascadero Creek Channel Diagrams and Spreadsheets
Reach 25,000-25,326 feet from confluence with Salinas River

Assisted by AmeriCorps
and California Conservation Corps

Atascadero Creek Longitudinal Profile
25,000-25,326 Feet Upstream from Confluence of Salinas River
November 2000, Survey



Atascadero Creek
STREAM CHANNEL
MORPHOLOGICAL ANALYSIS

Prepared for
State Department of Fish and Game

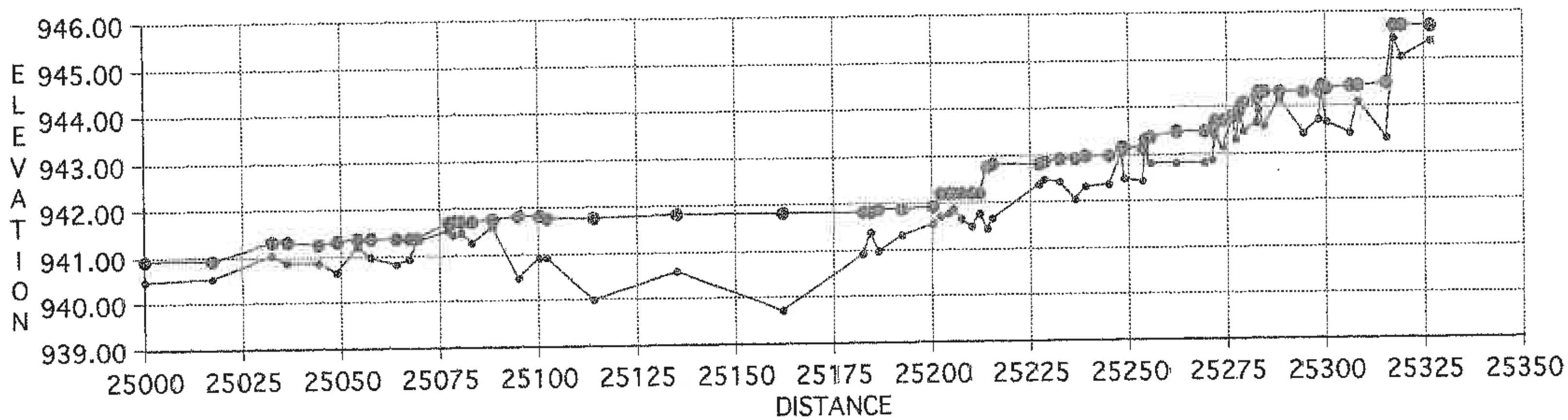
Upper Salinas-Las Tablas
Resource Conservation District

	A	B	C	D	E	F	G	H	I
1		Atascadero Creek Longitudinal Morphological Survey							
2									
3	GENERAL LOCATION:			25,000-25,326 feet upstream from confluence with Salinas River					
4	BASIS FOR BEGINNING DISTANCE:			Begin at H2O Quality Monitoring Site, westernmost of 3 Bridges on Hwy 41 west					
5	STUDY PREPARED FOR:			USLT-RCD					
6	SURVEY TEAM:			D. J. Funk, Hillary Peterson & Gary Johnston					
7	OTHERS ASSISTING:			CCC Crew: Paul Corsi & Stacy Smith; Data Entry and Graphing					
8	DATE(S) OF SURVEY:			November 3 & 8, 2000			Rained previous day		
9	GENERAL:	All distances in ft. Beginning elevation estimated from USGS map.							
10		Elevation ground level @ left B.M. at power pole estimated to be 960' based on USGS quad map							
11		Distance estimated: 25,000 est. from confluence with Salinas River based on USGS Quad							
12		and 1981 FEMA study.							
13		B.M. pins are estimated. View orientation: downstream.							
14	TERMS:	B.M.=Bench Mark, T.W.=Thalweg, W.F.=Water Surface, bkf=Bankfull, B.P.=Bank Pin							
15									
16	Distance	Thalweg	Water	Reading	Reading	B.M.	Level	Comments	
17	Salinas R.	Elev.	Surface	TW	WS		Elev.	rebar bench mark pin next to power pole	
18	25000	940.48	940.93	6.04	5.59	960.36	946.52	At X-Section at 3rd bridge (@ power pole)	
19	25017	940.56	940.97	5.96	5.55		946.52		
20	25032	941.08	941.32	5.44	5.20		946.52		
21	25036	940.87	941.31	5.65	5.21		946.52		
22	25044	940.89	941.30	5.63	5.22		946.52		
23	25049	940.65	941.33	5.87	5.19		946.52		
24	25054	941.23	941.37	5.29	5.15		946.52		
25	25057	941.00	941.38	5.52	5.14		946.52		
26	25064	940.81	941.38	5.71	5.14		946.52		
27	25067	940.92	941.39	5.60	5.13		946.52		
28	25069	941.31	941.39	5.21	5.13		946.52		
29	25077	941.53	941.71	4.99	4.81		946.52	Native Shrubs on Bank	
30	25078	941.44	941.72	5.08	4.80		946.52		
31	25080	941.52	941.73	5.00	4.79		946.52		
32	25083	941.30	941.74	5.22	4.78		946.52		
33	25088	941.60	941.78	4.92	4.74		946.52		
34	25095	940.52	941.81	6.00	4.71		946.52		
35	25100	940.94	941.81	5.58	4.71		946.52		
36	25102	940.95	941.78	7.98	7.15		948.93		
37	25114	940.01	941.80	8.92	7.13		948.93		

	A	B	C	D	E	F	G	H	I
38	25135	940.61	941.81	8.32	7.12		948.93		
39	25162	939.71	941.83	9.22	7.10		948.93		
40	25182	940.96	941.85	7.97	7.08		948.93		
41	25184	941.41	941.86	7.52	7.07		948.93		
42	25186	940.99	941.87	7.94	7.06		948.93		
43	25192	941.34	941.87	7.59	7.06		948.93		
44	25200	941.56	941.93	7.37	7.00		948.93		
45	25202	941.70	942.23	7.23	6.70		948.93		
46	25204	941.76	942.23	7.17	6.70		948.93		
47	25205	941.90	942.23	7.03	6.70		948.93		
48	25207	941.64	942.23	7.29	6.70		948.93		
49	25210	941.51	942.23	7.42	6.70		948.93		
50	25212	941.78	942.24	7.15	6.69		948.93		
51	25214	941.45	942.79	7.48	6.14		948.93		
52	25215	941.67	942.81	7.26	6.12		948.93		
53	25227	942.40	942.84	6.53	6.09		948.93		
54	25228	942.52	942.91	6.41	6.02		948.93		
55	25232	942.42	942.93	6.51	6.00		948.93		
56	25236	942.04	942.96	6.89	5.97		948.93		
57	25239	942.31	943.00	6.62	5.93		948.93		
58	25245	942.41	943.02	6.52	5.91		948.93		
59	25248	943.03	943.14	5.90	5.79		948.93		
60	25249	942.49	943.17	6.44	5.76		948.93		
61	25253	942.46	943.15	6.47	5.78		948.93		
62	25254	943.07	943.34	5.86	5.59		948.93		
63	25255	942.81	943.39	6.12	5.54		948.93		
64	25262	942.86	943.50	6.07	5.43		948.93		
65	25269	942.84	943.52	6.09	5.41		948.93		
66	25271	942.91	943.53	6.02	5.40		948.93		
67	25272	943.41	943.70	5.52	5.23		948.93		
68	25274	943.18	943.70	5.75	5.23		948.93		
69	25276	943.76	943.82	5.17	5.11		948.93		
70	25277	943.31	943.82	5.62	5.11		948.93		
71	25278	943.91	944.07	5.02	4.86		948.93		
72	25279	943.49	944.12	5.44	4.81		948.93		
73	25282	943.68	944.19	5.25	4.74		948.93		
74	25283	943.93	944.32	5.00	4.61		948.93		

	A	B	C	D	E	F	G	H	I
75	25284	943.60	944.31	5.33	4.62		948.93		
76	25288	944.16	944.32	4.77	4.61		948.93		
77	25294	943.42	944.33	5.51	4.60		948.93		
78	25298	943.72	944.34	5.21	4.59		948.93		
79	25299	944.32	944.43	4.61	4.50		948.93		
80	25300	943.65	944.41	7.80	7.04	948.36	951.45	Right rebar BM: 948.36, left BM: 951.69	
81	25306	943.47	944.44	5.46	4.49		948.93		
82	25308	944.09	944.47	4.84	4.46		948.93		
83	25315	943.32	944.49	5.61	4.44		948.93		
84	25317	945.47	945.73	3.46	3.20		948.93		
85	25319	945.03	945.70	3.90	3.23		948.93		
86	25326	945.38	945.72	3.55	3.21		948.93		
87									
88									
89									

ATASCADERO CREEK LONGITUDINAL PROFILE 25000-25300 FEET FROM CONFLUENCE WITH SALINAS RIVER

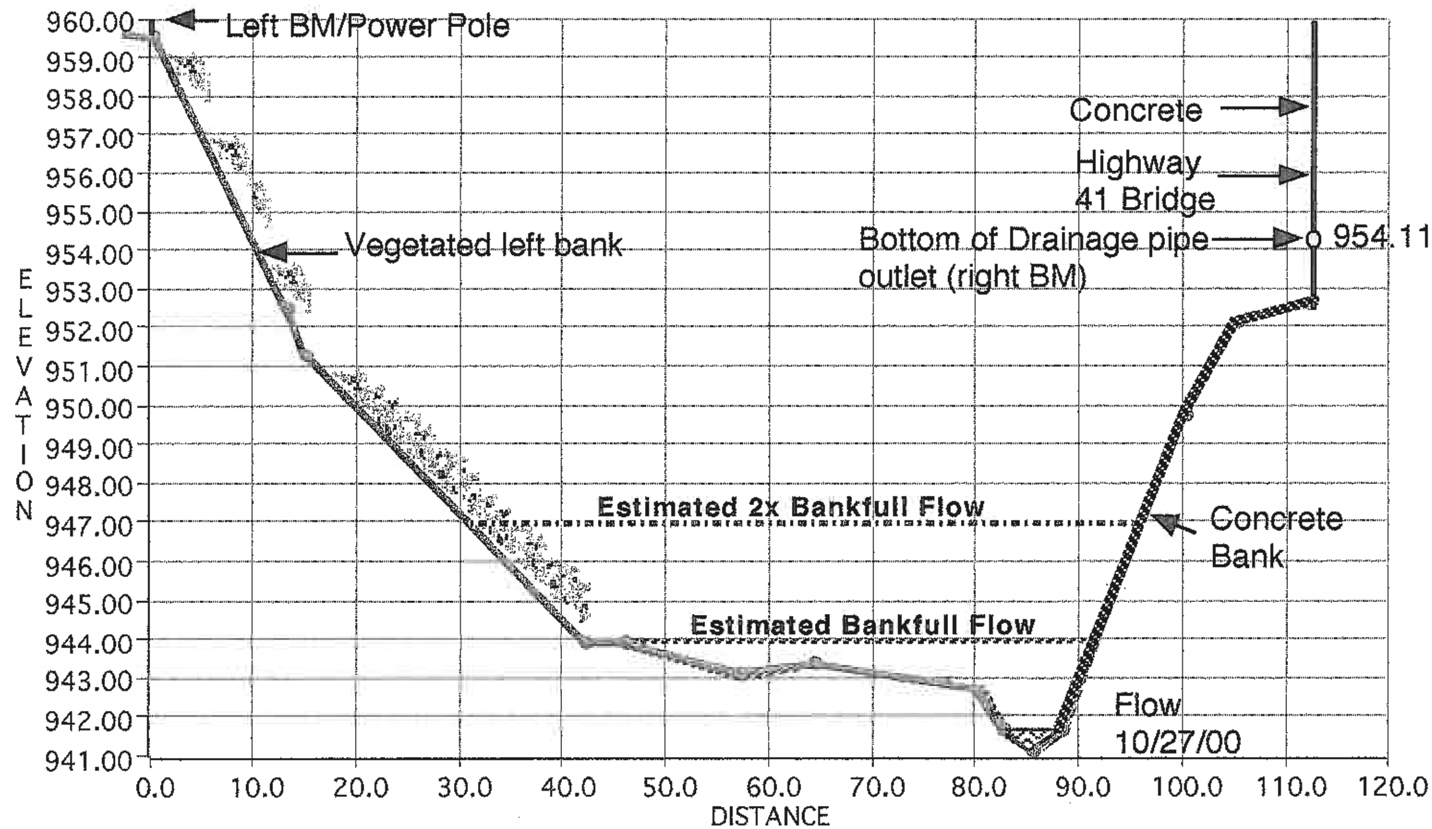


Assisted by AmeriCorps
and California Conservation Corps

Cross-Section Atascadero Creek
25,000 Feet From Confluence of Salinas River
October 2000 Survey

North side of Bridge

View Looking Downstream



Data from 10/27/00 survey

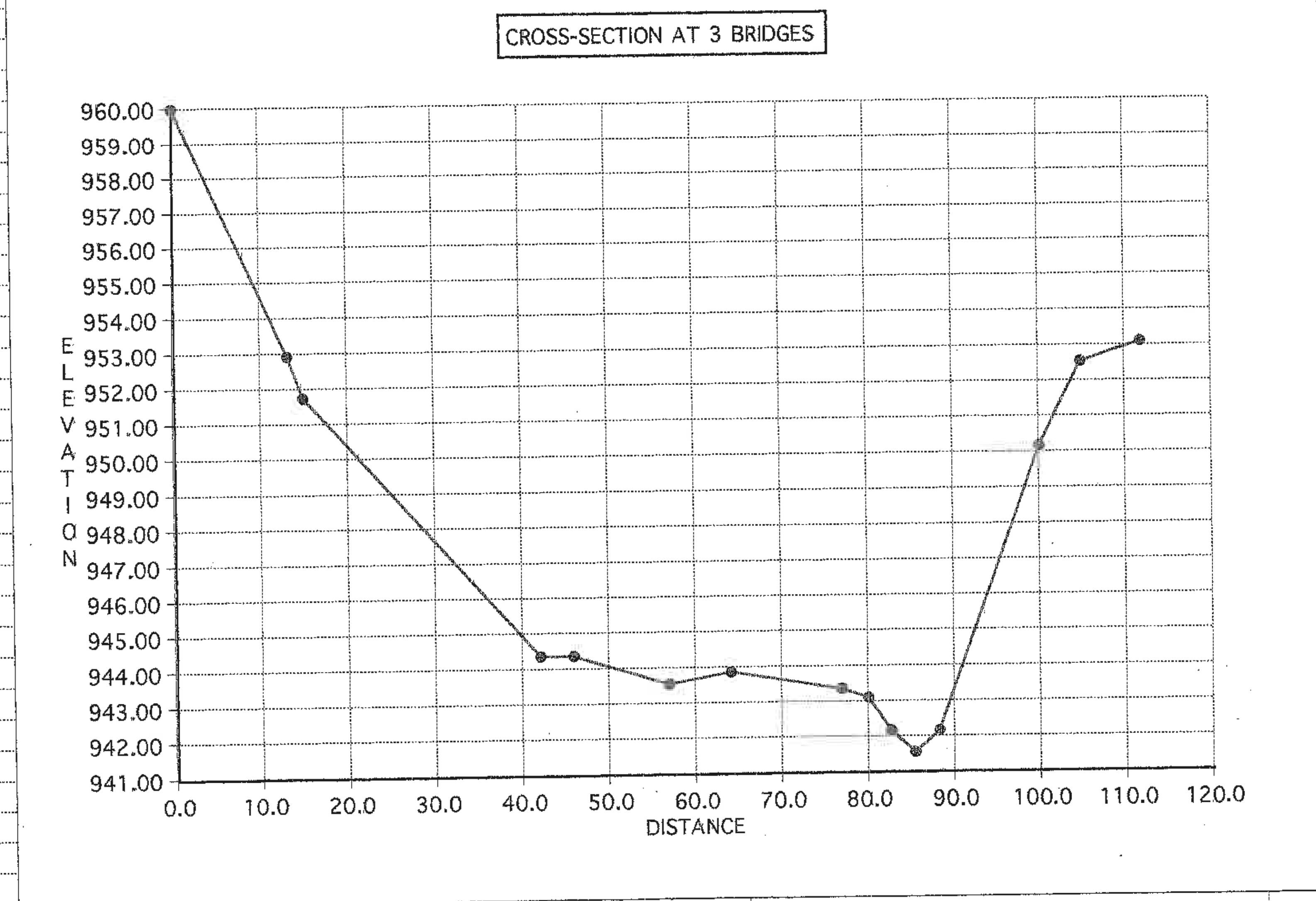
Atascadero Creek
STREAM CHANNEL MORPHOLOGICAL ANALYSIS

Prepared for
State Department of Fish and Game

Upper Salinas-Las Tablas
Resource Conservation District

	A	B	C	D	E	F	G	H	I	J
1			ATASCADERO CREEK CROSS SECTION 25,000 west of Salinas R.							
2										
3	GENERAL LOCATION:				25,000 feet from confluence with Salinas River					
4	X-SECTION LOCATION:				3 Bridges Hwy 41 west; westernmost bridge; H2O Quality Monitoring Site					
5	STUDY PREPARED FOR:				USLT-RCD					
6	SURVEY TEAM:				D. J. Funk, Hillary Peterson, Elizabeth Eggers & Gary Johnston					
7	OTHERS ASSISTING:				CCC Crew: Paul Corsi & Stacy Smith; Data Entry and Graphing					
8	DATE(S) OF SURVEY:				27 October 2000				Rained previous day	
9	GENERAL:	All distances in ft. Beginning elevation estimated from USGS map.								
10		Elevation of ground level @ left B.M. at power pole estimated to be 960' based on USGS quad map								
11		Distance estimated: 25,000 est. from confluence with Salinas River based on USGS Quad								
12	X-SECTION INFO.:				Beginning distance measured from left B.M. to right B.M. Points beyond					
13		B.M. pins are estimated. View orientation: downstream.								
14	TERMS:	B.M.=Bench Mark, T.W.=Thalweg, W.F.=Water Surface, bkf=Bankfull, B.P.=Bank Pin								
15	ENTRENCHMENT RATIO:			64/45=1.42 < 1.4 = Entrenched (A, G & F Stream types)						
16		1.4 - 2.2 = Mod. Entrenched (B Streams), > 2.2 = Slightly Entrenched (E & C Streams)								
17										
18	Distance	Ground	Reading	Bkf	Bench	BM	Level	BS	Comments	
19	rom Left BM	Elev.	Section		Mark	Reading	Elev.			
20									(6.20" below center of 3/8" bolt on pole)	
21	0.0	960.00	4.54		960.39	4.15	964.54		Bench Mark rock at edge of power pole on left bank	
22	13.2	952.95	11.59				964.54		vegetated bank	
23	15.0	951.75	12.79				964.54	0.96	turning pt reading 0.96, new level elev= 952.71	
24	42.0	944.40	8.31				952.71			
25	46.0	944.40	8.31				952.71		Estimated bankfull elevation	
26	57.0	943.56	9.15				952.71			
27	64.0	943.85	8.86				952.71			
28	77.0	943.35	9.36				952.71			
29	80.0	943.14	9.57				952.71			
30	82.5	942.17	10.54				952.71		left edge of stream flow	
31	85.3	941.58	11.13				952.71		Thalweg	
32	88.2	942.16	10.55				952.71		right edge of stream flow	
33	100.0	950.21	2.50				952.71		right bank is concrete	
34	105.0	952.56	0.15				952.71	10.38	turning pt reading 10.38, new level elev= 962.94	
35	111.8	953.10	9.84		954.50	8.44	962.94		BM, Bottom of drain pipe on bridge	
36										

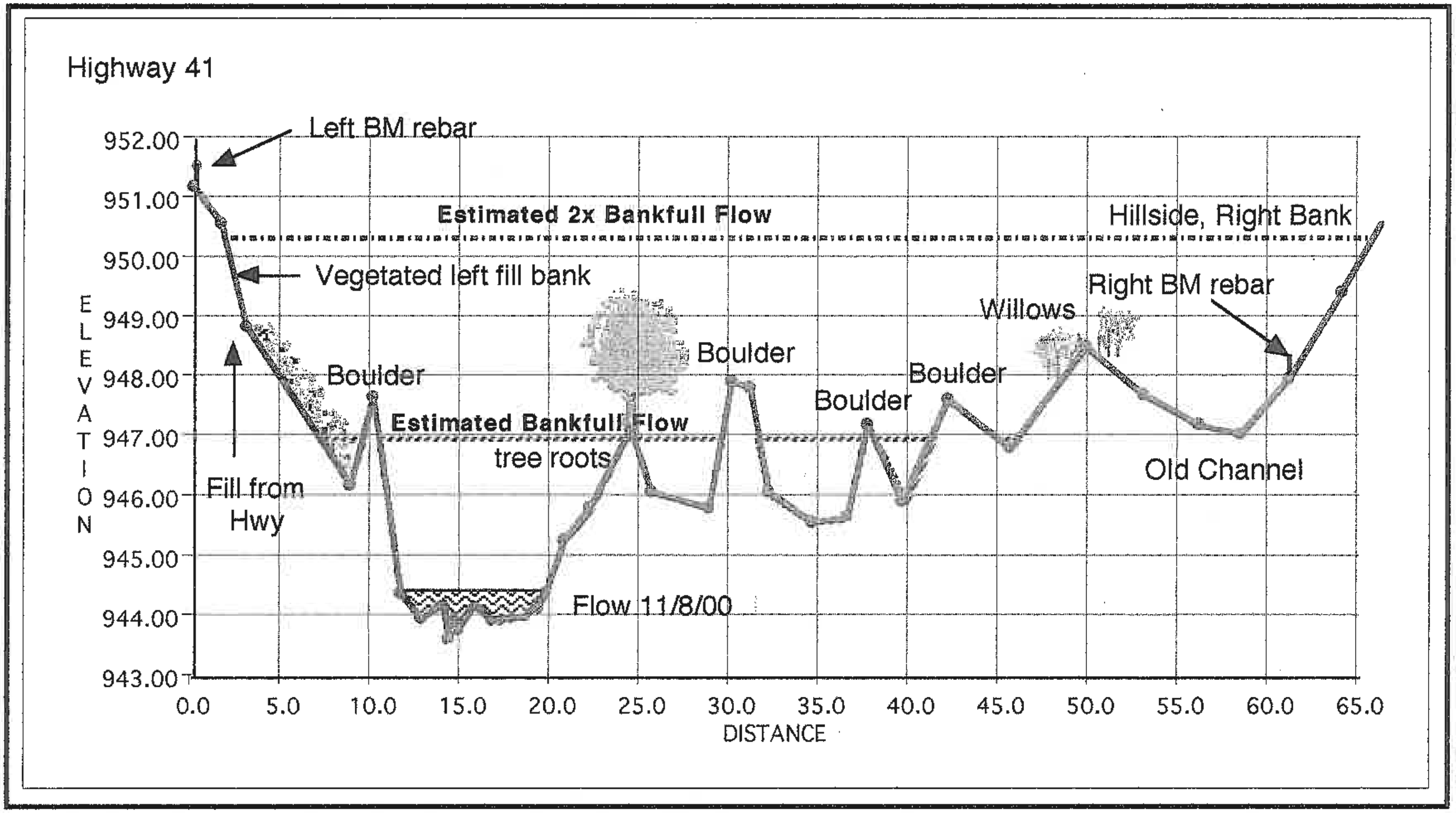
	A	B	C	D	E	F	G	H	I	J
37										
38	5									
39										
40	Atas. Creek est. Bkf flow of 39 cu ft./sec/sq. mi. since this area typically receives less rainfall than Pozo area									



Assisted by AmeriCorps
and California Conservation Corps

Cross-Section Atascadero Creek
25,300 Feet from Confluence of Salinas River
November 2000 Survey

View Looking
Downstream



Data from 11/08/00 Survey

Atascadero Creek
STREAM CHANNEL
MORPHOLOGICAL ANALYSIS

Prepared for
State Department of Fish and Game
State Water Resources Control Bd.

Upper Salinas-Las Tablas
Resource Conservation District

	A	B	C	D	E	F	G	H	I	J
1			ATASCADERO CREEK CROSS SECTION 25,300 west of Salinas R.							
2										
3	GENERAL LOCATION:				25,300 feet from confluence with Salinas River					
4	X-SECTION LOCATION:				300 feet west of 3 Bridges, along Highway 41 west					
5	STUDY PREPARED FOR:				USLT-RCD					
6	SURVEY TEAM:				D. J. Funk, Hillary Peterson & Gary Johnston					
7	OTHERS ASSISTING:				CCC Crew: Paul Corsi & Stacy Smith; Data Entry and Graphing					
8	DATE(S) OF SURVEY:				11/08/00			Clear weather		
9	GENERAL:	All distances in ft. Beginning elevation estimated from USGS map.								
10		Elevation of ground level @ left B.M. at power pole estimated to be 960' based on USGS quad map								
11		Distance estimated: 25,300 est. from confluence with Salinas River based on USGS Quad								
12	X-SECTION INFO.:				Beginning distance measured from left B.M. to right B.M. Points beyond					
13		B.M. pins are estimated. View orientation: downstream.								
14	TERMS:	B.M.=Bench Mark, T.W.=Thalweg, W.F.=Water Surface, bkf=Bankfull, B.P.=Bank Pin								
15	ENTRENCHMENT RATIO:			63/34 =1.85		< 1.4 = Entrenched (A, G & F Stream types)				
16		1.4 - 2.2 = Mod. Entrenched (B Streams), > 2.2 = Slightly Entrenched (E & C Streams)								
17										
18	Distance	Ground	Reading	Bkf	Bench	BM	Level	BS	Comments	
19	Left BM.	Elev.	Section		Mark	Reading	Elev.			
20									Two BM rebar pins, both right and left banks	
21	0.0	951.24	0.21		951.69	-0.24	951.45		Bench Mark left bank elev.: 951.69	
22	1.6	950.62	0.83				951.45		Left bank, steep fill slope from roadway, Hwy 41	
23	3.0	948.90	2.55				951.45			
24	8.7	946.22	5.23				951.45		Estimated bankfull elevation 947.00	
25	10.0	947.70	3.75				951.45		Small boulder next to stream flow	
26	11.6	944.41	7.04				951.45		Water surface, 11/8/00	
27	12.7	944.00	7.45				951.45			
28	14.0	944.28	7.17				951.45		Small boulder in stream	
29	14.2	943.65	7.80				951.45		Thalweg	
30	14.5	944.09	7.36				951.45			
31	14.8	943.82	7.63				951.45			
32	15.7	944.24	7.21				951.45			
33	16.7	943.97	7.48				951.45			
34	18.5	944.02	7.43				951.45			
35	19.2	944.24	7.21				951.45			
36	19.6	944.41	7.04				951.45		Water surface, 11/8/00	
37	20.7	945.32	6.13				951.45		Sycamore tree roots	

	A	B	C	D	E	F	G	H	I	J
38	22.0	945.83	5.62				951.45		Sycamore tree roots	
39	24.3	947.16	4.29				951.45		Sycamore tree roots	
40	25.5	946.12	5.33				951.45			
41	28.7	945.84	5.61				951.45			
42	30.0	947.96	3.49				951.45		Boulder	
43	31.0	947.85	3.60				951.45		Boulder	
44	32.0	946.10	5.35				951.45			
45	34.5	945.60	5.85				951.45		Old Stream Channel	
46	36.4	945.69	5.76				951.45			
47	37.6	947.25	4.20				951.45		Boulder	
48	39.5	945.95	5.50				951.45			
49	42.0	947.67	3.78				951.45		Boulder	
50	45.5	946.86	4.59				951.45			
51	49.7	948.52	2.93				951.45			
52	53.0	947.74	3.71				951.45			
53	56.0	947.24	4.21				951.45		Old Stream Channel	
54	58.3	947.06	4.39				951.45		Old Thalweg	
55	61.0	947.99	3.46		948.36	3.09	951.45		Right bank, rebar BM 948.36	
56	64.0	949.48	1.97				951.45		Slope on hill, right bank	
57										
58										
59										
60	* Salsipuedes Creek Watershed Gage Data Average for 14 yrs.: 59 cu. ft./sec/sq. mi. (return of 1.5 yrs. on average)									
61	This figure is believed to be high; Atas. Cr. Watershed anticipated to receive 2/3 flow of Salsipuedes Cr. Watershed									
62	Atas. Creek est. Bkf flow of 39 cu ft./sec/sq. mi. since this area typically receives less rainfall than Pozo area									
63										
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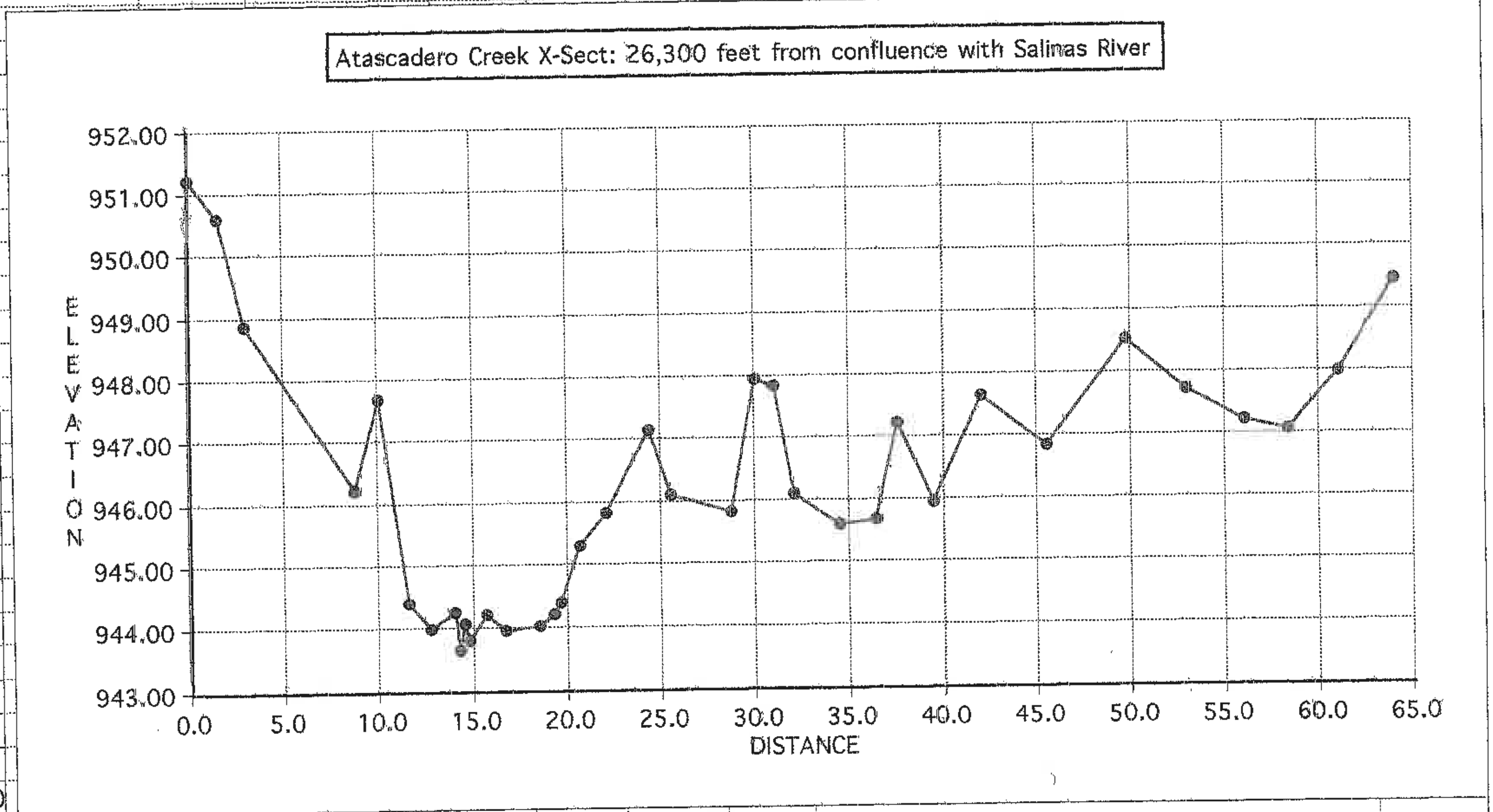
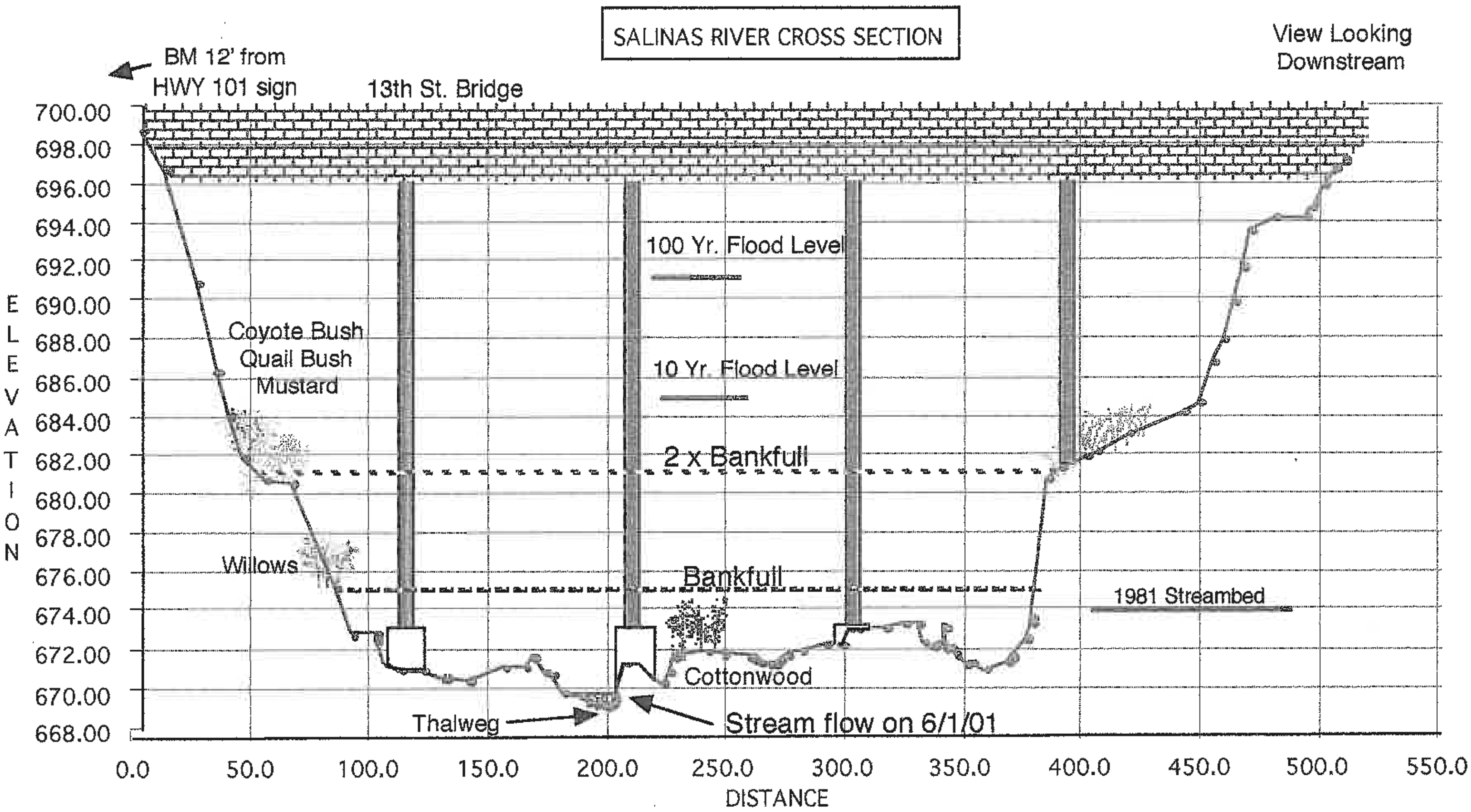

Atascadero Creek X-Sect: 26,300 feet from confluence with Salinas River
ELEVATION
952.00
951.00
950.00
949.00
948.00
947.00
946.00
945.00
944.00
943.00
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
45.0
50.0
55.0
60.0
65.0
DISTANCE

Salinas River Channel Diagrams and Spreadsheets
Reach 645,200 feet from Monterey Bay

Assisted by AmeriCorps &
California Conservation Corps

645,200 Feet Upstream From Mouth Of Monterey Bay



Data from 06/01/01 survey

* Flood levels and bankfull *
flow affected by Salinas dam

Salinas River
STREAM CHANNEL
MORPHOLOGICAL ANALYSIS

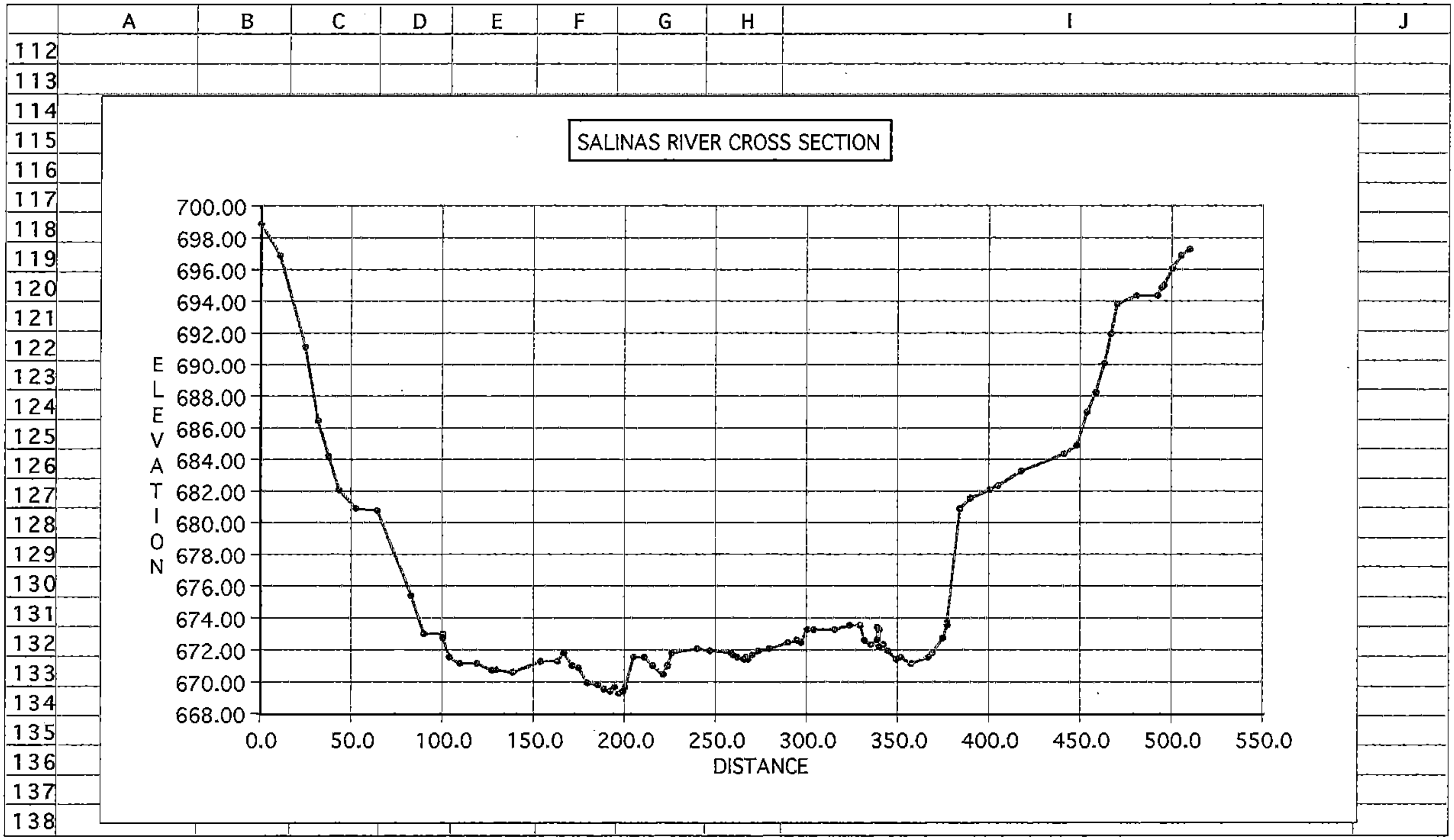
Prepared for
State Department of Fish and Game
State Water Resources Control Bd.
Natural Resource Conservation Service

Upper Salinas-Las Tablas
Resource Conservation District

	A	B	C	D	E	F	G	H	I	J
1			Salinas River Cross-Sectional Survey 13th St. Bridge							
2										
3	GENERAL LOCATION:				122.2 Miles, (645,200 ft) upstream of the river entrance into Monterey Bay					
4	X-SECTION LOCATION:				13th St. Brige, City of Paso Robles					
5	STUDY PREPARED FOR:				USLT-RCD					
6	SURVEY TEAM:				D. J. Funk, Hillary Peterson & Marti Johnson. Data input: Paul Corsi & Stacy Smith					
7	OTHERS ASSISTING:									
8	DATE(S) OF SURVEY:				06/01/01			Clear hot weather		
9	GENERAL:	All distances in ft. Beginning elevation estimated from FEMA March 16, 1981 flood survey for flood insurance study .								
10		Elevation of underside of 13th St. Bridge 696 ft. based on figure 04P Flood Profiles FEMA doc. : city of El Paso de Robles								
11		Distance estimated at 645,200 ft. upstream of Montery Bay, width of crossection at 463 ft., section area (square ft.)								
12		at 6656, velocity (ft. per second) at 6.6, based on Salinas River Floodway Data FEMA doc.								
13	X-SECTION INFO.:				Beginning distance at western most railing anchor bolt on north side					
14					View orientation: downstream.					
15	TERMS:	B.M.=Bench Mark, T.W.=Thalweg, W.F.=Water Surface, bkf=Bankfull, B.P.=Bank Pin								
16	ENTRENCHMENT RATIO:			337ft/297ft= 1.13 < 1.4 = Entrenched (A, G & F Stream types)						
17		1.4 - 2.2 = Mod. Entrenched (B Streams), > 2.2 = Slightly Entrenched (E & C Streams)								
18	Distance	Ground	Reading	Bkf	Bench	BM	Level	BS	Notes	
19	from Left BM.	Elev.	Section		Mark	Reading	Elev.			
20										
21	0.0	698.98	3.91		700.85	2.04	702.89		Railing anchor bolt on north side.	
22	10.0	696.97	5.92		694.93	7.96	702.89		at 101 South/North sign. BM marker in SW,12' from Hwy sign	
23	25.0	691.21	11.68				702.89		Approx. at 4th railing bolt from west end of bridge	
24	31.0	686.59	16.30				702.89		Bare dirt	
25	37.0	684.33	4.71				689.04		coyote bush	
26	43.0	682.12	6.92				689.04		quail bush, coyote bush & mustard on slope	
27	52.0	680.93	8.11				689.04			
28	64.0	680.79	8.25				689.04			
29	82.0	675.50	13.54				689.04		willows at bankfull	
30	89.0	673.03	16.01				689.04			
31	100.0	673.01	16.03				689.04			
32	100.0	672.80	4.56				677.36		sand at bridge	
33	103.7	671.65	5.71				677.36			
34	109.0	671.21	6.15				677.36			
35	119.0	671.15	6.21				677.36			
36	127.0	670.86	6.50				677.36			
37	128.5	670.82	6.54				677.36			

	A	B	C	D	E	F	G	H	I	J
38	138.0	670.68	6.68				677.36		gravel/sand channel	
39	154.0	671.30	6.06				677.36			
40	163.0	671.38	5.98				677.36			
41	166.8	671.91	5.45				677.36			
42	170.5	671.07	6.29				677.36			
43	174.0	670.88	6.48				677.36			
44	179.0	670.03	7.33				677.36			
45	184.7	669.81	7.55				677.36		water surface-left side	
46	188.0	669.63	7.73				677.36			
47	191.5	669.53	7.83				677.36			
48	194.0	669.67	7.69				677.36		tad poles-moss in river/ west edge of pillar	
49	196.0	669.34	8.02				677.36			
50	198.5	669.51	7.85				677.36			
51	200.0	669.73	7.63				677.36		water surface-right side	
52	205.0	671.56	5.80				677.36			
53	211.0	671.62	5.74				677.36		to east edge of pillar-213.5	
54	215.0	671.03	6.33				677.36			
55	220.7	670.57	6.79				677.36			
56	223.0	671.09	6.27				677.36			
57	225.4	671.85	5.51				677.36			
58	239.0	672.10	5.26				677.36		cottonwoods	
59	247.0	672.04	5.32				677.36			
60	258.0	671.84	5.52				677.36			
61	259.6	671.67	5.69				677.36		small channel-dry	
62	262.0	671.59	5.77				677.36			
63	265.5	671.45	5.91				677.36		substrate-cobbles	
64	266.3	671.62	5.74				677.36		dry channel	
65	267.4	671.41	5.95				677.36			
66	270.0	671.76	5.60				677.36			
67	273.0	671.95	5.41				677.36		substrate-sand	
68	279.0	672.12	5.24				677.36			
69	289.0	672.58	4.78				677.36			
70	294.0	672.71	4.65				677.36		west edge of pillar 296'	
71	296.0	672.57	4.79				677.36			
72	300.0	673.33	4.03				677.36			
73	303.8	673.31	4.05				677.36		center of pillar	
74	315.0	673.28	4.08				677.36			

	A	B	C	D	E	F	G	H	I	J
75	323.0	673.58	3.78				677.36			
76	329.2	673.63	3.73				677.36			
77	331.0	672.73	4.63				677.36			
78	335.0	672.36	5.00				677.36			
79	338.3	672.60	4.76				677.36			
80	338.6	673.45	3.91				677.36		tree root/cottonwood root	
81	339.7	673.27	4.09				677.36			
82	340.0	672.30	5.06				677.36			
83	342.0	672.46	4.90				677.36			
84	344.0	672.05	5.31				677.36			
85	348.5	671.45	5.91				677.36			
86	351.0	671.57	5.79				677.36			
87	357.5	671.14	6.22				677.36		no flow in this channel	
88	366.0	671.56	5.80				677.36			
89	369.0	671.92	5.44				677.36			
90	374.0	672.80	4.56				677.36			
91	376.5	673.63	3.73				677.36			
92	377.3	673.87	3.49				677.36			
93	384.3	680.98	14.02				695.00		top of bank/slightly above bank full	
94	390.0	681.54	13.46				695.00			
95	400.0	682.17	12.83				695.00		grass	
96	405.0	682.39	12.61				695.00		grass	
97	418.0	683.36	11.64				695.00		grass	
98	441.0	684.39	10.61				695.00			
99	448.0	684.94	10.06				695.00			
100	454.0	687.04	7.96				695.00			
101	458.0	688.20	6.80				695.00			
102	463.0	690.15	4.85				695.00			
103	466.5	692.04	2.96				695.00			
104	470.0	693.84	1.16				695.00			
105	480.0	694.42	0.58				695.00			
106	491.5	694.41	0.59				695.00			
107	494.6	694.95	0.05				695.00			
108	495.0	695.12	8.66				703.78			
109	500.0	696.07	7.71				703.78			
110	505.0	696.90	6.88				703.78			
111	509.4	697.37	6.41		703.43	0.35	703.78		ground even with bolt/bridge railing right BM	



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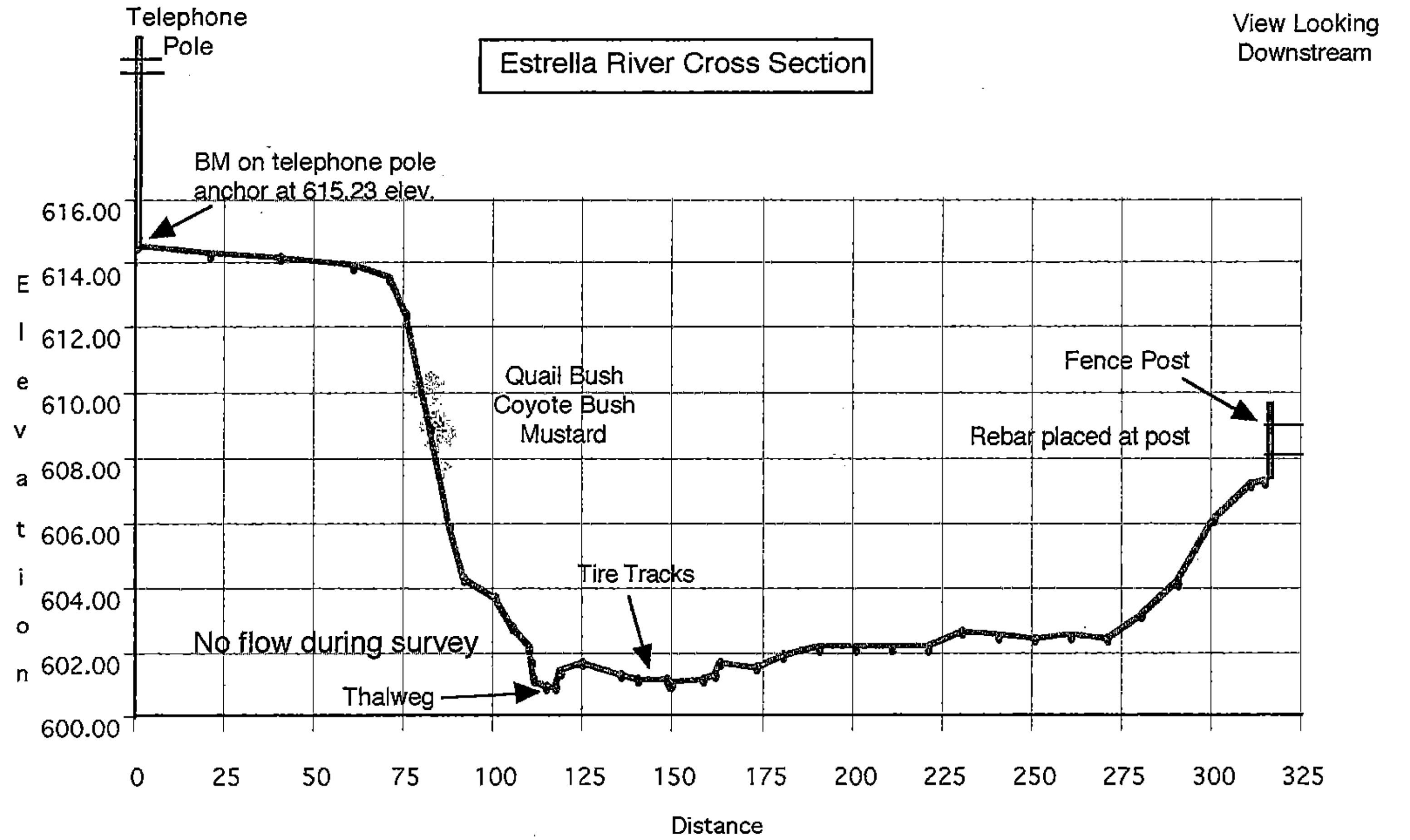
135
136
137
138
SALINAS RIVER CROSS SECTION
ELEVATION
700.00
698.00
696.00
694.00
692.00
690.00
688.00
686.00
684.00
682.00
680.00
678.00
676.00
674.00
672.00
670.00
668.00
0.0
50.0
100.0
150.0
200.0
250.0
300.0
350.0
400.0
450.0
500.0
550.0
DISTANCE

Estrella River Channel Diagrams and Spreadsheets
Reach 6,000 feet from confluence with Salinas River

Assisted by AmeriCorps &
California Conservation Corps

6000 Feet Upstream From Confluence with Salinas River



Data from 06/01/01 survey

Estrella River
STREAM CHANNEL MORPHOLOGICAL ANALYSIS

Prepared for
State Department of Fish and Game
State Water Resources Control Bd.
Natural Resource Conservation Service

Upper Salinas-Las Tablas
Resource Conservation District

	A	B	C	D	E	F	G	H	I	J
1			Estrella River Cross-Sectional Survey at North River Rd.							
2										
3	GENERAL LOCATION:				6000 feet from confluence with Salinas River					
4	X-SECTION LOCATION:				at River Road crossing near Salinas confluence					
5	STUDY PREPARED FOR:				USLT-RCD					
6	SURVEY TEAM:				D. J. Funk, Hillary Peterson & Marti Johnson					
7	OTHERS ASSISTING:									
8	DATE(S) OF SURVEY:				06/01/01			Clear hot weather		
9	GENERAL:	All distances in ft. Beginning elevation estimated from USGS map.								
10		Elevation of thalweg estimated to be 601' based on USGS quad map								
11		Distance estimated: 60+00 est. from confluence with Salinas River based on USGS Quad								
12	X-SECTION INFO.:				Beginning distance at power pole anchor (painted orange) on south side (left bank)					
13					View orientation: downstream.					
14	TERMS:	B.M.=Bench Mark, T.W.=Thalweg, W.F.=Water Surface, bkf=Bankfull, B.P.=Bank Pin								
15	ENTRENCHMENT RATIO:			67/46= 1.45 < 1.4 = Entrenched (A, G & F Stream types)						
16		1.4 - 2.2 = Mod. Entrenched (B Streams), > 2.2 = Slightly Entrenched (E & C Streams)								
17										
18	Distance	Ground	Reading	Bkf	Bench	BM	Level	BS	Notes	
19	from Left BM.	Elev.	Section		Mark	Reading	Elev.			
20										
21	0.0	614.66	3.53		615.23	2.96	618.19		Left BM at telephone power pole anchor	
22	20.0	614.39	3.80				618.19		edge of crop field	
23	40.0	614.28	3.91				618.19			
24	60.0	613.96	4.23				618.19			
25	70.0	613.58	4.61				618.19			
26	75.0	612.54	5.65				618.19			
27	82.0	609.01	9.18				618.19		quail bush, coyote bush & mustard on slope	
28	87.0	606.01	12.18				618.19			
29	91.4	604.41	13.78				618.19			
30	100.0	603.70	14.49				618.19			
31	105.0	602.89	15.30				618.19			
32	109.7	602.31	15.88				618.19			
33	109.8	601.72	9.17				610.89		flood level	
34	110.7	601.28	9.61				610.89			
35	114.0	601.01	9.88				610.89			
36	117.0	601.00	9.89				610.89		Thalweg	
37	118.5	601.53	9.36				610.89			

	A	B	C	D	E	F	G	H	I	J
38	124.3	601.70	9.19				610.89			
39	135.0	601.42	9.47				610.89			
40	140.0	601.28	9.61				610.89			
41	148.0	601.24	9.65				610.89		tire track	
42	148.7	601.09	9.80				610.89		tire track	
43	149.4	601.18	9.71				610.89		tire track	
44	157.2	601.24	9.65				610.89			
45	160.6	601.34	9.55				610.89			
46	162.0	601.79	9.10				610.89			
47	172.0	601.68	9.21				610.89			
48	180.0	601.94	8.95				610.89			
49	190.0	602.19	8.70				610.89			
50	200.0	602.29	8.60				610.89			
51	210.0	602.29	8.60				610.89			
52	220.0	602.23	8.66				610.89			
53	230.0	602.71	8.18				610.89			
54	240.0	602.68	8.21				610.89			
55	250.0	602.56	8.33				610.89			
56	260.0	602.63	8.26				610.89			
57	270.0	602.55	8.34				610.89			
58	280.0	603.31	7.58				610.89		grasses	
59	290.0	604.30	6.59				610.89			
60	300.0	606.26	4.63				610.89			
61	310.0	607.31	3.58				610.89			
62	314.5	607.37	3.52		607.55	3.34	610.89		Right BM--rebar at fence post	
63										
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66										
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70										
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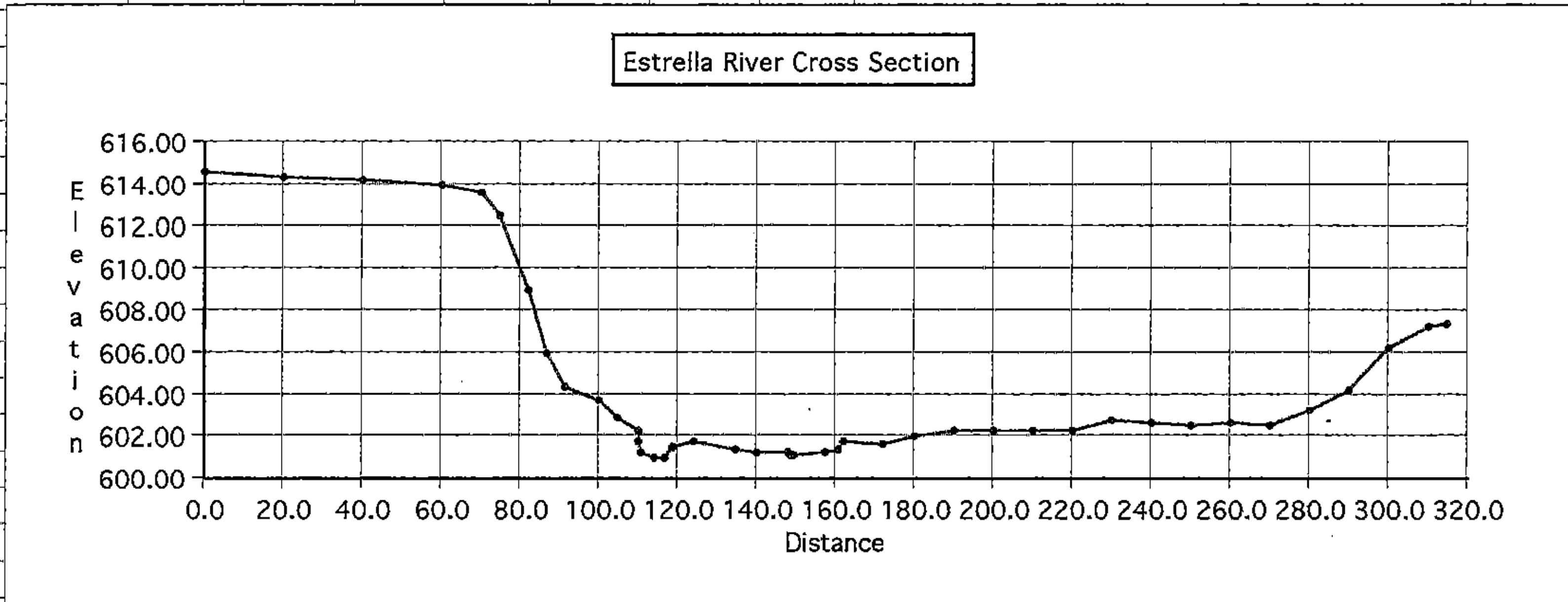

Estrella River Cross Section
Elevation
616.00
614.00
612.00
610.00
608.00
606.00
604.00
602.00
600.00
0.0 20.0 40.0 60.0 80.0 100.0 120.0 140.0 160.0 180.0 200.0 220.0 240.0 260.0 280.0 300.0 320.0
Distance

Upper Salinas-Las Tablas Resource Conservation District

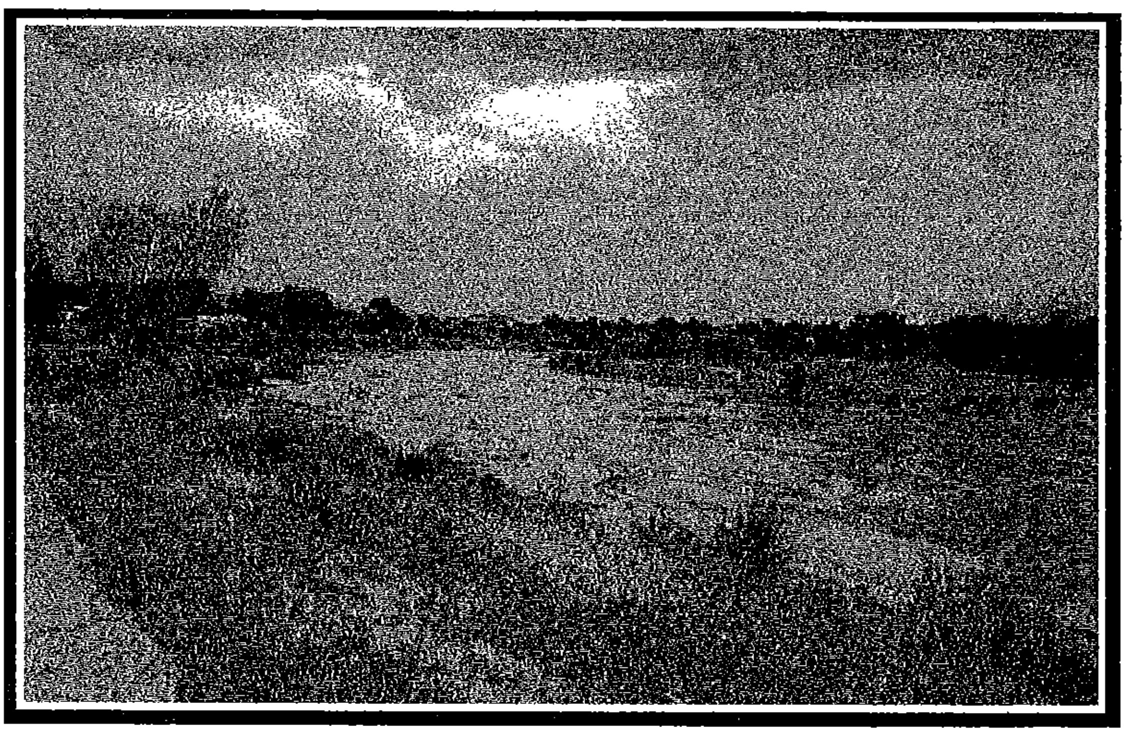
To the Department of Fish and Game

Draft Work Program

PHASE II OF THE UPPER SALINAS RIVER WATERSHED RESOURCE CONSERVATION MANAGEMENT PLAN RESOURCE AND HABITAT RESTORATION PROJECT

BACKGROUND INFORMATION

The Upper Salinas-Las Tablas RCD, in cooperation with NRCS, the Department of Fish and Game, the Central Coast Regional Water Quality Control Board, the State Water Resources Control Board and other agencies and organizations, has instituted a program to improve the conditions of the Salinas River. A list of "early actions" has been prepared. These early actions include a list of measures intended to improve the steelhead habitat conditions of these creeks. A stakeholder Task Force and a Technical Advisory Committee (TAC) were formed to assist the RCD in the preparation of a Watershed Resource Conservation Management Plan.



Salinas River near Atascadero Creek

The State Water Resources Control Board has designated the Salinas River and its tributaries as one of the most critical watersheds in the State of California due to degrading habitats and non-point pollution impacts on water quality. The Salinas River is the largest river system affecting the Monterey Bay, designated as a National Marine Sanctuary. As part of phase I of this project, the RCD initiated a planning effort for the watershed.

PHASE II WORK PROGRAM

General Description

The RCD has defined a three-phase workplan to collect data, determine problems and issues, prepare a watershed management plan, implement measures that will correct problems and assess the success of the program. One of the major purposes is to implement the strategies contained in the Water Quality Protection Program for the Monterey Bay National Marine Sanctuary, Action Plan IV: Agriculture and Rural Lands. The first phase of the project is a focus study of the Salinas River and several tributaries. The second phase will be to expand the study to other portions of the watershed and prepare a Watershed Resource Conservation Management Plan for the entire watershed. The third phase will include the implementation of the goals and measures determined in Phase II.

Components of the Phase II Draft Work Plan

- Expand the channel morphological and biological surveys to include additional representative reaches in the Salinas Watershed
- Conduct a habitat typing of current and historical steelhead stream channels
- Expand water quality monitoring
- Assist the farm bureaus and other groups in creating property owner initiated water quality monitoring. In addition, expand existing volunteer based water quality monitoring programs throughout the watershed.
- Support ongoing meetings of Upper Salinas Watershed Coalition, Task Force and Technical Advisory Committee
- Identify unhealthy conditions on reference reaches
- Identify steelhead barriers on current and historical steelhead streams
- Identify stream and watershed management options
- Quantify the degree of the problems
- Establish workable methods to improve habitat and meet total minimum daily loads (TMDL's) for sediment
- Encourage resource planning and the development of resource management plans, such as those promoted by Water Quality Planning short courses, the Central Coast Vineyard Team's positive point system, and NRCS incentives programs
- Compile/distribute technical information to public on agricultural conservation practices
- Strengthen referral network and cross-training for technical field staff with cooperating agencies
- Work with Farm Bureau to strengthen grower/rancher networks
- Evaluate and distribute information on cost effectiveness of management practices
- Work with farmers to implement RCD and NRCS prepared Beneficial Agricultural

Management Practices (BAMP's)

- Prepare the Resource Conservation Management Plan (RCMP) describing the findings and proposed goals, objectives and practices/actions
- Repair creek channel habitat. Projects are proposed along creeks, returning healthy meandering channels, establishing good pool-riffle ratios and planting of bank riparian vegetation
- Remove barriers to steelhead
- Promote programs to control noxious and invasive weeds
- Develop user friendly permit guidebooks central locations for permit information
- Develop permit streamlining for permits for conservation management practices
- Improve collaborative efforts between regulatory agencies and landowners
- Prepare Erosion Control Handbook for governmental agencies and property owner use
- Implement measures (such as signage) to prevent unauthorized vehicles from using the river channels. Gain cooperation of local enforcement agencies.
- Train and support volunteers
- Provide educational opportunities to the public through participation in a volunteer stream monitoring program. Work with students both in the classroom and during field trips to the river.
- Support expanded offerings and participation in the Ranch Water Quality Planning short courses as well as participating in the development and implementation of similar courses for vineyards and row crops;
- Conduct outreach such as with media releases
- Expand the existing creek clean-up program. This program could expand the Groundwater Guardian involvement in areas of the Upper Salinas River and tributaries.
- Expand the watershed educational fair.
- With assistance from the Cooperative Extension, construct a working watershed model for use at the fair and with local schools.
- Expand existing USLT-RCD programs such as the Erosion Control Assistance Program (ECAP), design assistance and conservation cost-share assistance to eligible landowners (such as NRCS EQIP and WHIP programs).
- Provide advice to agriculturalists for beneficial maintenance practices to address erosion control for roads
- Work with agencies to improve conservation measures on agency/public trust lands
- Determine acceptable alternative water resources for domestic and agricultural uses (examples: use of cisterns and use of reclaimed water)
- Provide measures for urban improvements such as reduction in impermeable surfaces, retention/detention/sediment basins, bioretention basins, use of planted drainage corridors, reductions in use of pesticides and fertilizers, etc.
- Recommend purchase of development rights in critical watershed areas.
- Identify possible future funding options
- Prepare a work program for Phase III

Geographical Area

The site is the Upper Salinas Watershed (the area is defined as the watershed of the Salinas and Estrella Rivers and other tributaries from the Nacimiento River south).

Program Phases

The project is Phase II of three phases. Phase I included the initiation of the planning program, the establishment of a Task Force and Technical Advisory Committee, creation of a monitoring protocol and volunteer network, beginning of a survey program and the preparation of a list of problems facing the watershed. Phase II will expand the study to include other creeks and rivers in the watershed, prepare the Resource Conservation Management Plan (RCMP) and accomplish the other items identified in this draft work program. Phase III will begin the implementation portion of the program and the assessment of the success of the action items.

Cooperating Agencies and Organizations

This project is a collaboration of a number of agencies and organizations:

Agencies

- State Department of Fish and Game
- State Water Resources Control Board
- Central Coast Regional Water Quality Control Board
- USDA Natural Resources Conservation Service
- Monterey Bay National Marine Sanctuary
- Monterey County Resource Conservation District
- California Conservation Corps
- City of Atascadero
- Atascadero Mutual Water Company
- County of San Luis Obispo

Organizations

- San Luis Obispo County Farm Bureau
- Nature Conservancy
- UC Cooperative Extension
- American Watersheds ACSF
- Central Coast Vineyard Team
- Groundwater Guardian