FINAL REPORT

RESTORATION ACTIONS
WITHIN THE
SAN LUIS OBISPO CREEK WATERSHED

PREPARED FOR THE AVILA BEACH TRUSTEE COUNCIL

with Funds from the Avila 1992 Unocal Oil Spill Settlement

San Luis Obispo County, California

MARCH 2008

THE
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OF SAN LUIS OBISPO COUNTY
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PHOTO BY
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AND VEGETABLE-OIL INK

The Land Conservancy
OF SAN LUIS OBISPO COUNTY

INTRODUCTION AND BACKGROUND

OIL SPILL IMPACTS

At least 77 birds killed (pelicans, shearwaters, cormorants and others).

3 sea otters killed and at least 2 more injured.

10,000 king salmon killed in Central Coast Salmon Enhancement pens (20% of their population).

4 miles of shoreline oiled.

5 days Avila Beach and Olde Port Beach closed.

21 days Pirate's Cove Beach closed.

Estimated 160 barrels of spilled oil recovered.

On August 3, 1992, an oil pipeline owned by UNOCAL ruptured and spilled approximately 600 barrels (25,200 gallons) of San Joaquin Valley crude oil onto nearby lands and water in the Avila Beach area. The spill directly impacted natural resources, including hillside vegetation, intertidal and subtidal habitat, fish, birds and marine mammals.

In May 1996, a settlement was reached between UNOCAL and State and Federal agencies that provided funding for the restoration of resources injured by the spill.

The State Settlement Agreement and Federal Consent Decree required UNOCAL to deposit $950,000 into an interest-bearing trust account with the National Fish & Wildlife Foundation (NFWF), to be managed by the California Department of Fish & Game (CDFG).

The State Settlement and Federal Consent Decree provided guidance on the categories of restoration projects and levels of funding. The settlement allocated $425,000 for revegetation and bank repair, $250,000 for fish passage barrier removal, and $275,000 for estuarine habitat restoration. In addition, the State Settlement and Federal Consent Decree required the sum of $150,000 to be paid to the Port San Luis Harbor District for enhancement of Port area beaches, and a sum of $100,000 to be paid to the Department of the Interior's Natural Resources Damage Assessment and Restoration Fund for sea otter enhancement projects.

Following the settlement, a Trustee Council was formed to ensure coordination and cooperation of the State and Federal natural resource trustees. The Trustee Council is made up of representatives from the California Department of Fish & Game (CDFG), Office of Spill Prevention and Response (OSPR), and the United States Fish & Wildlife Service (USFWS).

The Trustee Council is responsible for expending the funds from the settlement for the express purpose of restoring, replacing, rehabilitating, or acquiring the equivalent of the natural resources injured by the oil spill.

The Trustee Council subsequently determined that on-site restoration projects in estuarine and intertidal habitats and adjacent waters would be technically difficult to implement and expensive relative to expected benefits.

Consequently, the Trustee Council evaluated off-site projects in and along San Luis Obispo Creek and its tributaries that would be technically feasible and would restore or benefit the same types of resources injured in the Avila Beach spill. Funds were also allocated to provide education and public outreach.

A restoration plan was prepared, with public input, describing feasible projects that would restore the resources damaged by the spill. These projects included riparian corridor revegetation and bank repair, and fish barrier removal. Revegetation and bank repair projects reduce sediment delivery to the creek and estuary, expanding and improving habitat for native riparian plant species, steelhead trout and resident fish. Barrier removal facilitates the passage of steelhead trout and resident fish.

The Avila Beach Restoration Plan was completed in March, 1999. Separate plans were prepared for the sea otter restoration fund and the work undertaken by Port San Luis Harbor District.

The Trustee Council selected The Land Conservancy of San Luis Obispo County as the local project management group for projects to be completed under this plan that were not part of the sea otter and Harbor District plans.

The Land Conservancy was chosen based on experience with restoration project implementation, local community involvement, and watershed program development.

The Land Conservancy worked on behalf of the Trustee Council to assist in project design and permitting, preparing implementation plans, and providing local implementation and oversight. In March 2008, The Land Conservancy and Trustee Council completed the restoration actions associated with the spill settlement.

This report summarizes the work completed and highlights three revegetation and bank repair projects, two fish passage projects and two community outreach projects.

The following map shows localities of all projects undertaken with settlement monies.

RESTORATION PROJECT BENEFITS

11 improved fish passage projects completed to make waterways more fish-friendly.

12 acres wetlands restored.

5 restored stream bank zones totaling 1 linear mile, with hundreds of native shrubs and trees planted.

133 stands of invasive giant reed cleared from San Luis Obispo Creek watershed.

4000 storm drains marked with anti-pollution signage.

Thousands of people enjoying 5 new interpretive signs throughout the watershed each year.

Hundreds of hours spent by local volunteers installing plants and learning about the projects.

PHOTO BY LYNDA ROELLER

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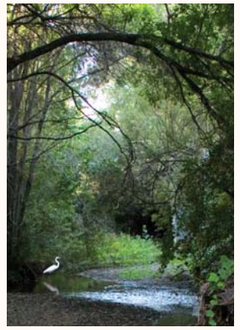
AVILA PROJECTS MAP



SAN LUIS OBISPO CREEK WATERSHED

San Luis Obispo Creek is a perennial stream and is the main drainage feature of the greater San Luis Obispo Creek Watershed (54,336 acres). The stream forms along the hills of the Santa Lucia Range east of the City of San Luis Obispo, and is joined by Stenner and Prefumo Creeks (among others) before meeting the ocean at Avila Beach. The creek winds it's way through grazing land in the upper watershed, through a gap in the hills to San Luis Obispo, and back through grazing and croplands south of the city at Avila Beach. Approximately 16% of the watershed (9,024 acres) lies within San Luis Obispo city limits.

REVEGETATION & BANK REPAIR PROJECTS

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DEVINCENZO . . . . . .lower San Luis Obispo Creek, near Highway 101
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VOLUNTEERS

Local community involvement is an essential element of The Land Conservancy's effectiveness. Here volunteers study a Storm Drain grid map to determine the locations for markers placed throughout San Luis Obispo and Avila Beach to remind residents and visitors that everything drains to the creeks and the ocean.

PHOTOS BY
KAILA DETTMAN
AND LYNDA ROELLER

REVEGETATION AND BANK REPAIR

REVEGETATION

After several years, a dense growth of sage, coffeeberry, blackberry, and baccharus has filled in the streambank.

Steelhead and other fish depend on cool clean water to survive. The role of streamside vegetation in controlling water temperature and water quality is an important one. Shade trees help keep the sun from heating the water and understory plants help filter water running into streams from adjacent lands. Trees along streams are also a source of woody debris that creates important cover habitat for fish.

Studies of the streams in the SLO Creek Watershed identified projects that address poor vegetation conditions as a priority. Settlement funds were used to replace vegetation in degraded sections of San Luis Obispo Creek. In total, over one linear mile of stream banks was replanted at five sites (see map, page 5).

Another identified problem for fish in the SLO Creek watershed was sedimentation caused by upland and stream bank erosion. Erosion is a natural process, but when too much erosion occurs, sediment enters the stream and covers the stream bottoms.

This sediment prevents water from flowing through stream bed gravel to nurture steelhead eggs. As a result, spawning success is reduced and fewer young fish survive. Sedimentation also leads to the filling of stream pools that are important rearing habitats for fish. The three projects featured here reduce stream bank erosion and the associated sedimentation of the stream.

1

MIDDLE SAN LUIS OBISPO CREEK

The middle reach of San Luis Obispo Creek was degraded by invasive, non-native plants and was experiencing erosion of stream banks. In addition, floodwaters were scouring the valuable topsoil off the adjacent agricultural land.

The goal of this project was to stabilize one particularly eroded stream bank and restore a buffer of native vegetation to reduce flood damage to agricultural land and sedimentation of the stream.

To repair the eroded stream bank, the bank was first re-sloped with a backhoe to an angle gentle enough for vegetation to be established. Precautions were taken during the grading to make sure none of the soil entered the stream.

Once the bank was properly shaped, the toe of the slope required protection so the stream would not undercut the new sloped bank. For this step, a natural slope protection method was used.

Rather than using large boulders, fiber rolls made from shredded coconut husks (biologs) were used in tandem with live willow planting.

These materials help build the strength of the bank naturally while providing habitat cover for fish and birds. The upper portions of the sloped bank were planted with other native plants and covered with an erosion control net. Several seasons later, the restored bank is naturally restored… and even hard to find.

On the remainder of the stream banks, a 20-30 foot corridor of native plants was planted along 2,400 feet of the creek.

As these plants mature, they will slow down the velocity of floodwaters and reduce the scouring of valuable soils. As the creek recedes following a flood, the vegetation filters sediment from the water to reduce the amount of sediment entering the stream.

The trees planted will also serve to shade the creek, keeping water temperatures lower, and provide homes to native birds. These functions are a benefit to the farming operation and fish, as well as area wildlife.

REPLANTING A STREAM BANK

1. San Luis Obispo Creek, near South Higuera Street and the Octagon Barn.

2. Mats woven from an organic coconut fiber called *coir* protect the bank from erosion caused by rushing water. The mats take a few years to decompose completely, allowing young plants time to grow and take over the job of holding soil in place.

3. Holes are made in the mat and native vegetation is planted.

4. Biologs are flexible rolls of coir mat covered with coir netting. The biologs are placed at the base of the slope to stabilize the bank.

5. Compare this photo with number 4 to the left. The red stake that was placed to stabilize the biologs is still there, but mostly hidden by 4 - 6" diameter willows.

2

3

4

5

PHOTOS BY BRIAN STARK AND JUDITH HILDINGER

WETLAND HABITAT

One of the best known functions of wetlands is to provide habitat for birds. Birds use wetlands for feeding, resting, shelter, and social interactions. Birds also rely on wetlands for breeding and rearing young. For most wetland-dependent birds, the loss of breeding habitat translates directly into smaller populations.

FILIPPONI ECOLOGICAL AREA

This project is located on a conservation property owned by the City of San Luis Obispo. It is the highlight of a 12-acre wetland and revegetation habitat improvement project.

The settlement funds helped create a more complex and functional wetland, providing nutrient-filtering and cleansing immediately upstream of the confluence with the East Fork Tributary and the main stem of San Luis Obispo Creek. This area also serves as a flood refuge for fish during high flows.

Before the project, the stream banks were eroded and were supporting little vegetation. Parts of the bank were re-sloped to hold vegetation, using netting and biologs. Grading undertaken through this grant included reduction of the floodplain elevation along a 500-foot section of the East Fork of San Luis Obispo Creek to increase the flooding frequency of the area.

Following the grading, the banks and floodplain were replanted with a mixed palette of native plants. Approximately 400 feet of streambank was replanted. Some minor repairs were necessary following a winter flood, as was the installation of a live willow siltation baffle. The plantings thrived on this site and the area is already recruiting other native plants.

Volunteers were essential to the success of this project. Most of the planting was done by volunteers, including long-term Land Conservancy volunteer stewards who cared for the site on a regular basis by irrigating the plants and keeping weeds under control.

The California Conservation Corps also assisted with project installation and care.

1

2

3

4

REVEGETATING A FLOODPLAIN

The South Higuera Street bridge can be seen in the background of the photos above. (1, 2)
Before the project, the streambank was eroded and vegetation was sparse. Parts of the bank were re-sloped to hold vegetation, using netting and biologs. The plantings are now thriving on this site. (3, 4)

ESTUARY BIRDS USING THIS SITE

Prior to construction, a bird survey in 2002 found 33 different species of birds utilizing the site. In 2005, the total species count was over 95!

Birds found at Filipponi Ecological Area that also frequent the estuarine habitats near the mouth of San Luis Obispo Creek:

Double-Crested Cormorant
Great Blue Heron
Great Egret
Green Heron
American Bittern
Mallard
Cinnamon Teal
Hooded Merganser
American Coot
Wood Duck
Northern Shoveler
Killdeer
Least Sandpiper
Greater Yellowlegs
Long-billed Curlew
Virginia Rail
Sora
Wilson's Snipe
Ring-billed Gull
Bonaparts Gull
Mew Gull
Western Gull
(Some of these same species were injured or killed during the spill.)

PHOTOS BY
JASMINE WATTS
JUDITH HILDINGER
BRIAN STARK

The upper portion of San Luis Obispo Creek flows out of beautiful canyons that can be seen from Highway 101, fed by springs year-round along the Cuesta Grade.

UPPER SAN LUIS OBISPO CREEK

As the creek meanders through the foothills, it provides valuable spawning habitat for steelhead and feeds the wells and water troughs of homes and ranches that have been owned by local families for many generations. However, in some areas the creek has been heavily impacted by increased runoff and erosion from the freeway and historic land uses.

Settlement funds were used here to stabilize stream banks and improve steelhead habitat in the creek by repairing a 150-foot reach of the creek that had a tight S-curve. Along the curve, the stream bounced off each bank at extremely high velocities during rain events, causing intense erosion on each turn.

One of the banks was 18 feet tall and supported a historic stagecoach road. Every winter, soil from the bank fell into the creek, weakening the road and adding sediment to the stream. Vegetation struggled to grow on either bank, thus raising the temperature of the water and reducing areas for steelhead to hide from predators.

First, the stream was diverted through pipes to protect it from construction because the project required that heavy equipment enter the streambed. To protect the banks, low-profile rock structures were constructed along the toe of the vertical banks and live willow stakes were planted. Innovative structures named rock vanes were installed to re-direct the flow away from the banks and guide the creek through the site.

At the base of the 18-foot bank a bench was created that allowed us to build "soil wraps" of biodegradable erosion control blankets and live willow branches. This provides extra strength to the slope to allow for the willows to develop strong roots and subsequently grow larger and support the slope for the long term while providing shade for the creek. On top, the planted native shrubs and trees will one day grow up to provide even more shade on the creek. In total, 40 pounds of native seed were applied, over 750 willow stakes were placed, and 130 tons of rock was set to rebuild the banks.

UPPER
SAN LUIS OBISPO CREEK
BANK STABILIZATION

1. The crumbling bank before the project began.

2. After, with rock vanes in place to help re-direct the flow away from the banks.

3. A bench was created to support the coir mats and live willow stakes.

4. The bank is replanted with native species.

5. The eroding bank was 18 feet tall and falling fast.

6. The creek was dammed and boulders were placed at the foot of the bank.

1

2

GIANT REED (ARUNDO)
Tackling just one stand of Arundo is a big job.

INVASIVE PLANT REMOVAL

The San Luis Obispo Creek Watershed's riparian areas, and the fish and wildlife that depend upon these areas for food and shelter, are vulnerable to ecological disruption from invasive non-native plants.

Among the most harmful invasive species is giant reed *(Arundo donax)*.

Plants rapidly colonize disturbed or bare areas before native species are recruited, and in some cases will crowd out existing natives.

Arundo stands can grow more than 15 feet high, and if not controlled, can create a severe ecological and flooding problem. An Arundo monoculture replaces native willow, cottonwood, and sycamore, thus eliminating many food and shelter sources for birds and fish.

Unfortunately, Arundo can spread unchecked in San Luis Obispo creeks since none of its natural predators are present.

As part of the settlement, funding was set aside to remove large stands of Arundo, a plant native to India that is similar to bamboo. The Land Conservancy developed a removal strategy which was adopted for use by the Trustee Council.

Over 130 targeted stands of Arundo from San Luis Obispo Creek, Stenner and Acacia Creeks, and nearby areas were mapped and eliminated.

3

4

5

6

PHOTOS BY
BRIAN STARK
KAILA DETTMAN
AND MARK SKINNER

STEELHEAD HABITAT ENHANCEMENT

JUVENILE STEELHEAD

Steelhead populations have declined dramatically due to poor water quality, habitat loss, and barriers to migration such as dams.

FISH PASSAGE

FINDING A WAY THROUGH THE MAZE

San Luis Obispo Creek has a long history with respect to steelhead trout. Early newspaper articles describe a creek so full of steelhead that one could walk across on their backs. Watershed-wide, steelhead populations have diminished due to poor water quality, habitat loss, and introduced barriers to migration.

Specifically, habitat studies have identified sedimentation and shortage of pool habitat as limiting factors for steelhead trout. Other limiting factors present in certain areas include lack of canopy vegetation and in-stream cover habitat.

The steelhead trout that inhabit the San Luis Obispo Creek Watershed are federally listed as a "threatened" species. Their future survival depends on their ability to access suitable habitats for spawning that are often located in the upper reaches of streams. However, access to many of these areas has been blocked by dams, culverts, and other impediments.

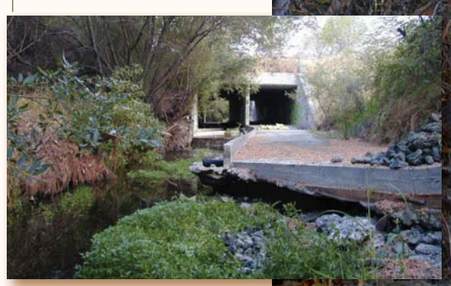
The Trustee Council chose fish passage improvement as one of the most important steps to restoring fisheries in San Luis Obispo Creek Watershed.

The restoration plan described 10 high-priority barriers to steelhead migration. Between 1999 and 2004, nine of these were modified to improve migration conditions (see map, page 5).

The tenth barrier was damaged by a storm and fish passage conditions improved naturally. Two additional barriers were added to the list due to available funding and thse projects have also been completed.

Highlights of two completed projects are featured here.

1



2

STENNER CREEK AT HIGHLAND DRIVE

RESTORING AN OLD FISH PASSAGE

This former fish migration barrier on Stenner Creek is located on the Cal Poly campus. The problem at this site was the vertical drop that fish had to negotiate. Juvenile fish in particular lack the jumping ability of adult fish.

In this case, the culvert under Highland Drive was already treated for fish passage using a concrete baffle system. While this system did work, the water depth during periods of low flow through the culvert spillway was still insufficient for some younger fish.

This project minimized the vertical jump by installing three boulder weirs that brought the stream elevation back up to the spillway elevation.

An additional concrete baffle at the end of the spillway was added to increase the water depth on the spillway and concentrate the low flow into a better migration channel.

The project was made more complex because this culvert has a road incorporated with it to move farm equipment under the overpass. The road had become undercut, so it was necessary to fill the undercut section to support the road and to make sure the stream flow did not travel under the road and around the passage project.

The project required some fine tuning after construction, but is now functioning well and providing easy access for migrating fish of all ages.

FIXING THE FISH PASSAGE

1. Before, the road was undercut and a steep drop created a barrier for fish.

2. The finished project allows juvenile steelhead to negotiate the creek.

3. The undercut road was filled in and shored up with boulders.

4. The barrier is reduced...

5. ...so water can flow and fish can pass.

6. Pools were created with boulders cemented in place.

3

4

5

6

PHOTOS BY BRIAN STARK AND KAILA DETTMAN

PREFUMO CREEK AT HIGHWAY 101
FISH PASSAGE PROJECT

PREFUMO CREEK
FISH PASSAGE

1. Flat concrete surface blocked fish passage.

2. New pools, after construction of baffles toslow the water and create depth sufficient for fish to swim through.

This fish barrier involved a 165-foot long concrete culvert that carries Prefumo Creek under Highway 101. The structure posed several challenges to migrating fish. First, the culvert outlet was over four feet higher than the stream below, creating a vertical jumping barrier. To complicate passage, boulders at the outlet did not allow for a pool to form, and pools are necessary for fish to generate jumping power.

In addition, during low flow periods, the creek flowed through the rocks and there was no route for fish to swim through. If a fish was able to get up the initial jump, it would land on a wide and flat concrete surface.

During low flow periods, the water depth on the culvert bottom was not deep enough for a fish to swim. During higher flows, the velocity of the water increased and fish were unable to swim against the current.

These problems were addressed first by rearranging the rocks below the outfall to make pools, then grouting the rocks so the pools would hold water. This made for four small jumps instead of one high jump. The grouting also made for permanent pools that would create a path for migrating fish. The actual culvert was modified by adding a baffle system that slows down the water flow and creates sufficient depth for fish migration. The project subsequently provided successful fish passage.

Since this project involved modifications to state-owned infrastructure, it required working closely with CalTrans. They required extensive studies of stream hydrology and engineering aspects of the project to make sure it did not increase flooding risks or other damage to the highway. The design accommodated the needs of all parties, especially the fish.

2

1

PHOTOS BY
JUDITH HILDINGER
AND BRIAN STARK

THE UPPER SAN LUIS OBISPO CREEK RIPARIAN CORRIDOR SITE

During the 2007 survey, 208 juvenile steelhead were found near this project site.
A survey conducted in 2003 found only 13 steelhead here.

Restoration work on other parts of the property and good winter rains for the last two years are most likely the primary reasons so many healthy steelhead were found here.

PHOTOS BY
LOIS ROBIN
JESSICA WHEELER

STEELHEAD TROUT SAMPLING

To assess steelhead spawning success relative to locations of the fish passage projects, Avila settlement funds were used to perform a population census of juvenile steelhead in the San Luis Obispo Creek watershed (Alley, 2008).

Electrofishing at 69 stratified random sites in various reaches of the watershed was used to estimate the steelhead population size. More than 20 miles of stream were surveyed, and habitat conditions were evaluated at each sampling site in summer 2007. (Alley, 2008).

The total steelhead population estimate was 37,000, of which 11,000 were at least 3 inches (75 mm) in length. Most juveniles less than 3 inches will remain in the stream an additional year, while these larger fish will migrate to the ocean in the winter/spring and are most likely to return as adults.

Densities of the larger juveniles are also most affected by habitat quality.

The best habitat and highest population contribution of larger juveniles was found in the lower San Luis Obispo Creek mainstem.

Consisting of about 30% of the surveyed stream miles, it produced an estimated 34% of the larger juveniles, and most of those were fast-growing young-of-the-year (YOY) fish.

Streamflow was much higher here, the pools were the deepest of any reach, and fastwater habitat (runs and riffles) was deep enough to be heavily used by YOY steelhead. Escape cover was also relatively high in all habitats.

The lowest densities of juveniles occurred in the Upper Stenner reach (11% of the surveyed stream miles, only 2% of the smaller fish (YOY) and 4% of the larger juveniles), where difficult fish passage conditions were observed, indicating that adult spawning access might have been impeded the previous two winter/springs.

Low quality habitat in Upper Stenner also contributed to low steelhead density. Low winter flows combined with physical obstacles were limiting adult fish passage in the dry year of 2007. Future fish sampling could tell us more about the value of fish passage improvement projects.

Low YOY densities and good yearling densities in other reaches of the watershed in 2007 indicated that adult spawning access likely occurred in the relatively wet winter/spring of 2005-2006 but may have been impeded in the dry winter/spring of 2006-2007.

One of the longest trout found in lower San Luis Obispo Creek in August, 2007 measured over 12 inches.

COMMUNITY OUTREACH & EDUCATION

WATERWAY PROTECTION DAY – STICKING IT TO STORMWATER POLLUTION

It was critical to the Avila Trustee Council that some funds provide for public education about the watershed, and two major projects were implemented:

"Sticking It to Storm Water Pollution" drain markers and "Watershed & Steelhead" interpretive signs.

In May 2006, The Land Conservancy in partnership with San Luis Obispo County, the City of San Luis Obispo and local residents, gathered to review maps and then spread out all over the town to install sturdy, permanent bilingual storm drain markers reading "Drains to Creek".

Teams were also sent out in Avila Beach, where San Luis Obispo Creek enters the ocean, to install markers reading "Drains to Ocean". A kick-off event held the night beforehand featured San Luis Obispo Mayor Dave Romero (below right) and other dignitaries "sticking it" to stormwater pollution along the beach in Avila.

With the help of more than 250 local kids and families, over 1,450 drains were marked in neighborhoods throughout the City of San Luis Obispo. An additional 1,550 markers were installed at California Polytechnic State by University personnel and throughout the County by maintenance crews.

This event promoted (and continues to promote) the importance of keeping our creeks clean. Participants found out first hand just how many drains are potential pollution sources throughout the urban area of the watershed. They learned we all have a vested interest in recognizing that the water we drink, the creeks and beaches where our children play, and the waterways that steelhead and other wildlife live in are all directly impacted by the pollutants that flow into them via storm drains throughout the county.

STICKING IT TO POLLUTION

Sabina Zink and Chase Doyle join the fun.

San Luis Obispo mayor Dave Romero helps out.

WATERSHED & STEELHEAD SIGNAGE SERVING AS A CREEKSIDE DOCENT FOR THOUSANDS OF VISITORS

Illustrating the value of San Luis Obispo Creek to the thousands of locals and visiting tourists who frequent much of the area originally affected by the oil spill is an important investment in community support for restoration and rehabitation projects.

Attractive signage is an asset to the landscape, and will provide a long-term benefit to the community originally affected by the spill.

Six interpretive signs were installed at popular localities along San Luis Obispo Creek. The signs are of similar design, most featuring a large steelhead trout to evoke familiarity if the visitor reaches more than one site.

The uppermost location, at Cuesta Regional Park north of the City of San Luis Obispo, features signage about steelhead spawning in the headwaters of San Luis Obispo Creek.

In Santa Rosa Park, along an urban stretch of Highway 1, one sign describes the importance of the tributary Stenner Creek for spawning trout.

At Mission Plaza in downtown San Luis Obispo, where thousands of tourists come each year to see the mission and wander along the creek, another sign was installed explaining San Luis Obispo's unique urban interaction with the creek.

A fourth sign has been installed along the Bob Jones Bike Trail at the Bill Roalman memorial site in southern San Luis Obispo, which discusses industrial impacts on the creek.

And at Avila Beach Community Park, where the creek enters the ocean, one sign discusses estuarine life and the steelhead trout lifecycle, while another is dedicated to ocean birdlife.

EDUCATIONAL SIGNAGE

The bird identification sign at Avila Beach is viewed by thousands of visitors and residents each year.

This sign at Mission Plaza is located in one of San Luis Obispo's most popular visitor destinations.

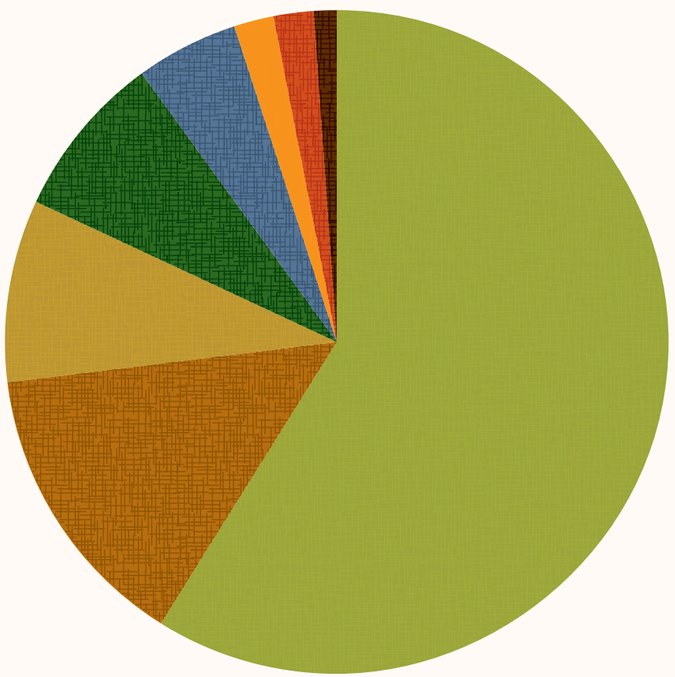
PHOTOS BY JUDITH HILDINGER AND KAILA DETTMAN

FINANCIAL SUMMARY

AVILA 1992 UNOCAL OIL SPILL SETTLEMENT FUND WATERSHED ENHANCEMENT EXPENDITURES APRIL 1998 – MARCH 2008

A total of $1,208,000 was used from settlement monies (the $950,000 originally granted, plus interest earned) to accomplish the projects outlined in this report. Over 75% of the funds were used directly on revegetation and bank repair, fish passage improvement, invasive species removal, fish census, and community education projects. The remainder was spent on planning, administration, project monitoring and repairs.

Fish Passage, Revegetation, Bank Repair	$ 716,000	59%
Project Monitoring and Repairs	167,000	14%
Project Administration, Planning, and Permitting	105,000	9%
Invasive Species Plan, Plant Removal	101,000	8%
Steelhead Census	60,000	5%
Educational Signage	25,000	2%
Restoration Plan	20,000	2%
Storm Drain Markers	14,000	1%
Total Project Monies	$ 1,208,000	100%



- 59% Fish Passage, Revegetation and Bank Repair $716,000
- 14% Project Monitoring and Repairs $167,000
- 9% Administration, Planning, Permitting $105,000
- 8% Invasive Species Plan and Plant Removal $101,000
- 5% Steelhead Census $60,000
- 2% Educational Signage $25,000
- 2% Restoration Plan $20,000
- 1% Storm Drain Markers $14,000

TOTAL PROJECT MONIES $1,208,000 100%

REFERENCES

Alley, D.W. & Associates, *Population Census of Juvenile Steelhead in San Luis Obispo Creek Watershed,* report for The Land Conservancy. January 2008

Avila Beach Trustee Council, *Final Plan For Restoration Actions Within the San Luis Obispo Creek Watershed: Unocal Oil Spill, Avila Beach, 1992.* CA Department of Fish & Game, Office of Oil Spill Prevention & Response; U.S. Fish & Wildlife Service. 1999

Cleveland, Paul A., *San Luis Obispo Creek Steelhead Trout Habitat Inventory and Investigation.* Land Conservancy of San Luis Obispo County. 1995

The Land Conservancy of San Luis Obispo County. *Final Plan for Restoration Actions within the San Luis Obispo Creek Watershed.* March 1999

The Land Conservancy of San Luis Obispo County. *San Luis Obispo Creek Watershed Enhancement Plan.* January 2002

The Land Conservancy of San Luis Obispo County. *San Luis Obispo Creek Watershed Invasive Plant Management Plan for Riparian Areas.* January 2004

Payne & Associates, *Distribution and Abundance of Steelhead in the San Luis Obispo Creek Watershed, CA*; report for City of San Luis Obispo. April 2004

State of California Resources Agency, Department of Fish & Game. *California Salmonid Stream Habitat Restoration Manual, 3rd Edition.* January 1998

PARTNERS

The Avila Beach Trustee Council and The Land Conservancy would like to thank the following people and agencies indispensable to the success of the Avila Restoration Projects:

AGENCIES

Avila Beach Civic Association
Avila Beach Fish & Farmer's Market
California Department of Transportation, District 5
California Department of Fish & Game
City of San Luis Obispo
County of San Luis Obispo
County of San Luis Obispo Public Works Department
San Luis Coastal Unified School District
United States Army Corp of Engineers
United States Fish & Wildlife Service

PARTNERS

California Conservation Corps
Cal Poly San Luis Obispo State University
Fossil Inc.
Gaia Graphics & Associates
LSA Associates
Landowners who graciously allowed access and project completion
Mustang Village
RJ Burke Corporation
Specialty Construction
Volunteers of all ages

AVILA BEACH TRUSTEE COUNCIL

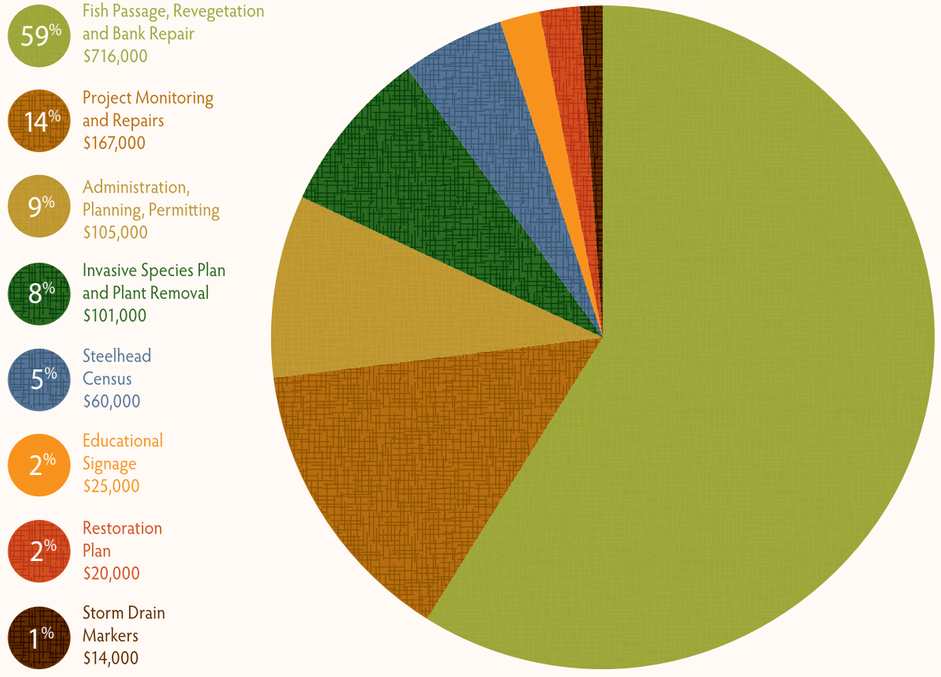
The Land Conservancy OF SAN LUIS OBISPO COUNTY

FINANCIAL SUMMARY

AVILA 1992 UNOCAL OIL SPILL SETTLEMENT FUND WATERSHED ENHANCEMENT EXPENDITURES APRIL 1998 – MARCH 2008

A total of $1,208,000 was used from settlement monies (the $950,000 originally granted, plus interest earned) to accomplish the projects outlined in this report. Over 75% of the funds were used directly on revegetation and bank repair, fish passage improvement, invasive species removal, fish census, and community education projects. The remainder was spent on planning, administration, project monitoring and repairs.

Fish Passage, Revegetation, Bank Repair	$ 716,000	59%
Project Monitoring and Repairs	167,000	14%
Project Administration, Planning, and Permitting	105,000	9%
Invasive Species Plan, Plant Removal	101,000	8%
Steelhead Census	60,000	5%
Educational Signage	25,000	2%
Restoration Plan	20,000	2%
Storm Drain Markers	14,000	1%
Total Project Monies	$ 1,208,000	100%



TOTAL PROJECT MONIES $1,208,000 (100%)

REFERENCES

Alley, D.W. & Associates, *Population Census of Juvenile Steelhead in San Luis Obispo Creek Watershed,* report for The Land Conservancy. January 2008

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