
July
2007

State Water Resources Control Board
Division of Financial Assistance

WATERSHED PROTECTION PROGRAM

**GOVERNOR'S
BIENNIAL
REPORT**

No. 3
July 2007
State Water Resources Control Board

WATERSHED PROTECTION PROGRAM BIENNIAL REPORT TO THE GOVERNOR

This Report was prepared pursuant to Chapter 6, Article 2, Section 79083 (b) of the Costa-Machado Water Act of 2000 (Proposition 13), which requires the State Water Resources Control Board (State Water Board) to submit a Biennial Report to the Governor regarding the implementation of the Watershed Protection Program (WPP). Proposition 13 authorized \$90 million for implementing the Watershed Protection Program.

This is the third Biennial Report on this topic. The other two Reports were submitted in 2003 and 2005. This Biennial Report provides information on the 115 projects that have been funded to date using WPP funds and includes the required discussion relating to the extent to which the purposes of Water Code Section 79077 of Article 2, described below, are being furthered by the implementation of the Watershed Protection Program.

The purpose of the Watershed Protection Program is to assist in implementing watershed plans to:

- Reduce flooding;
- Control erosion;
- Improve water quality;
- Improve aquatic and terrestrial species habitats;
- Restore natural systems of groundwater recharge, native vegetation, water flows, and riparian zones;
- Restore the beneficial uses of waters of the state in watersheds; and
- Provide matching funds for federal grant programs.

Background on State Water Board approach to watershed management

In 2000, the State Water Board and Resources Agency initiated a study of watershed partnerships in California as required by AB 2117 (Chapter 735, Statutes of 2000). The results of the study were published in the Report, *Addressing the Need to Protect California's Watersheds: Working with Local Partnerships* (April 2002). The results have been considered, where appropriate, during implementation of the Proposition 13 Watershed Protection Program.

In December 2001, eight federal and 11 state agencies and the CALFED Bay-Delta Program entered into a Memorandum of Understanding (MOU) to provide a framework for implementing the CALFED Watershed Program Plan. The State Water Board was one of the agencies that signed the MOU. The CALFED Watershed Program was established to help achieve the goals of CALFED to restore ecological health and improve water management of the Bay-Delta system by working with the community at a watershed level. The CALFED Watershed Program provides financial and technical assistance for watershed activities that help achieve the CALFED goals. The State Water Board's FY 2001-02 budget included \$7.9 Million, and the FY 2002-03 budget

included \$12.1 Million in appropriations for local assistance from the Proposition 13 Watershed Protection Program to meet the goals of the CALFED Watershed Program.

Watershed Protection Program Project Commitments

The State Water Board has completed the award phase for three competitive grant cycles. The three phases committed all of the funding for the Watershed Protection Program, although a few grantees were not able to complete their projects and declined the funding.

The three tables below present the 115 projects that have received funding to date through the three phases. The State Water Board approved: the Phase I Project List in May 2001; the Phase II Project List in October 2002; and the Phase III Funding List in June 2004.

The Bond required that 60% of the funds be for projects in six Southern California Counties (Los Angeles, Orange, Riverside, San Diego, San Bernardino, and Ventura). The Bond also requires that 85% of the funds be used for capital outlay projects (identified below as "Implementation Projects").

Section 79084 of Proposition 13 required that at least thirty-five million dollars (\$35,000,000) be for grants to small communities. In the article, "small community" means a municipality with a population of 10,000 persons or less, a rural county, or a reasonably isolated and divisible segment of a larger municipality where the population of the segment is 10,000 persons or less, with a financial hardship as determined by the State Water Board. This section also said that if the State Water Board determines that any of the funds made available for grants under this section will not be encumbered for that purpose on or before January 1, 2007, the State Water Board may use these funds for other purposes of this article.

In the first phase, 40 projects were funded, including the four set-aside projects specifically identified in the Bond and 36 competitive grants. In the first phase, a significant amount of funding was committed to the development of Local Watershed Management Plans. These Plans are watershed specific; identify strategies to achieve ecologically stable watersheds; and identify projects for future implementation.

The second phase funding was primarily committed to implementation projects, consistent with Local Watershed Management Plans and Regional Water Quality Control Plans. The third phase projects are predominantly implementation projects selected to achieve the balance between capital outlay and planning, and to achieve the geographic distribution defined in the statute.

In Phases II and III there were 31 CALFED Watershed Program (WP) projects funded. The CALFED WP projects funded during Phase II were all in the northern half of the State and many qualified as small communities with financial hardships. The State Water Board approved the CALFED WP projects on October 17, 2002.

As projects have been completed, small amounts of WPP funds accumulated from unspent funds and from declined funds. The State Water Board used these funds to supplement its Proposition 40, Integrated Watershed Management Program (IWMP) and awarded the funds through its 2005-06 Consolidated Grants Program.

Of the 115 projects listed below, 67 have been completed and 48 are still active. Completed projects are all required to have Final Reports submitted by the grantee. These Final Reports describe: 1) the purpose and scope of the project; 2) all items prepared and submitted as required by the contract; and 3) an analysis of how the project purposes have been met. Reporting and monitoring of the projects' status and effectiveness are required as project outputs. Data on the effectiveness of projects is collected as grantees report individual project assessment evaluation and performance.

Evaluations of the project results show that the Watershed Planning Projects developed new collaborative partnerships, increased stakeholder participation, and identified pertinent implementation projects within the watersheds. The capital outlay projects that have been completed were mainly focused on reducing flooding, controlling erosion, improving water quality, and improving aquatic species habitats.

Although 48 projects are still active, most of these are more than half completed, and it can be anticipated that in the next Watershed Protection Program Biennial Report in 2009, it will be possible to fully characterize the specific benefits that were achieved by the Program as a whole.

Project Summaries

Attachment A contains summaries of completed implementation projects (non-CALFED) and selected completed planning projects. Summaries of the CALFED projects are presented in a CALFED Watershed Program Catalog that can be found at:

http://www.calwater.ca.gov/Programs/Watershed/WatershedGrantsCatalogue02_04.shtml

The purpose of most planning projects is to produce a Local Watershed Management Plan that is developed with input from all affected stakeholders. Sections 79078 (b) and (c) in Proposition 13 define the required content of these Local Watershed Management Plans. Funding for planning projects was limited to a maximum of \$200,000 per planning project by Proposition 13. In many cases partial Management Plans had been previously developed in some watersheds and the purpose of the Planning Grant was to allow for completion of these planning efforts up to the established standard. Attachment A contains Project Summaries from selected planning projects to illustrate the Watershed Management process and highlight exceptional or unique Plan elements.

The funded implementation projects accounted for about 90% of the spending in the Watershed Protection Program. These projects were to implement activities that were consistent with Local Watershed Management Plans and Regional Water Quality Control Plans. Therefore, the majority of the planning funds (see Table 2, below) were used in Phase I to ensure that local groups that wanted to later apply for implementation grants would be able to meet the requirement to have an established Local Watershed Management Plan in place.

Maps showing the approximate locations of the 115 projects are included as Figures 1 and 2, below. Figure 1 shows the locations of the planning projects and Figure 2 shows the locations of the implementation projects. The map locations are based on the addresses given by the applicants, and may not be the location of the actual project in the case of the implementation projects.

Figure 1- Watershed Protection Program Planning Projects

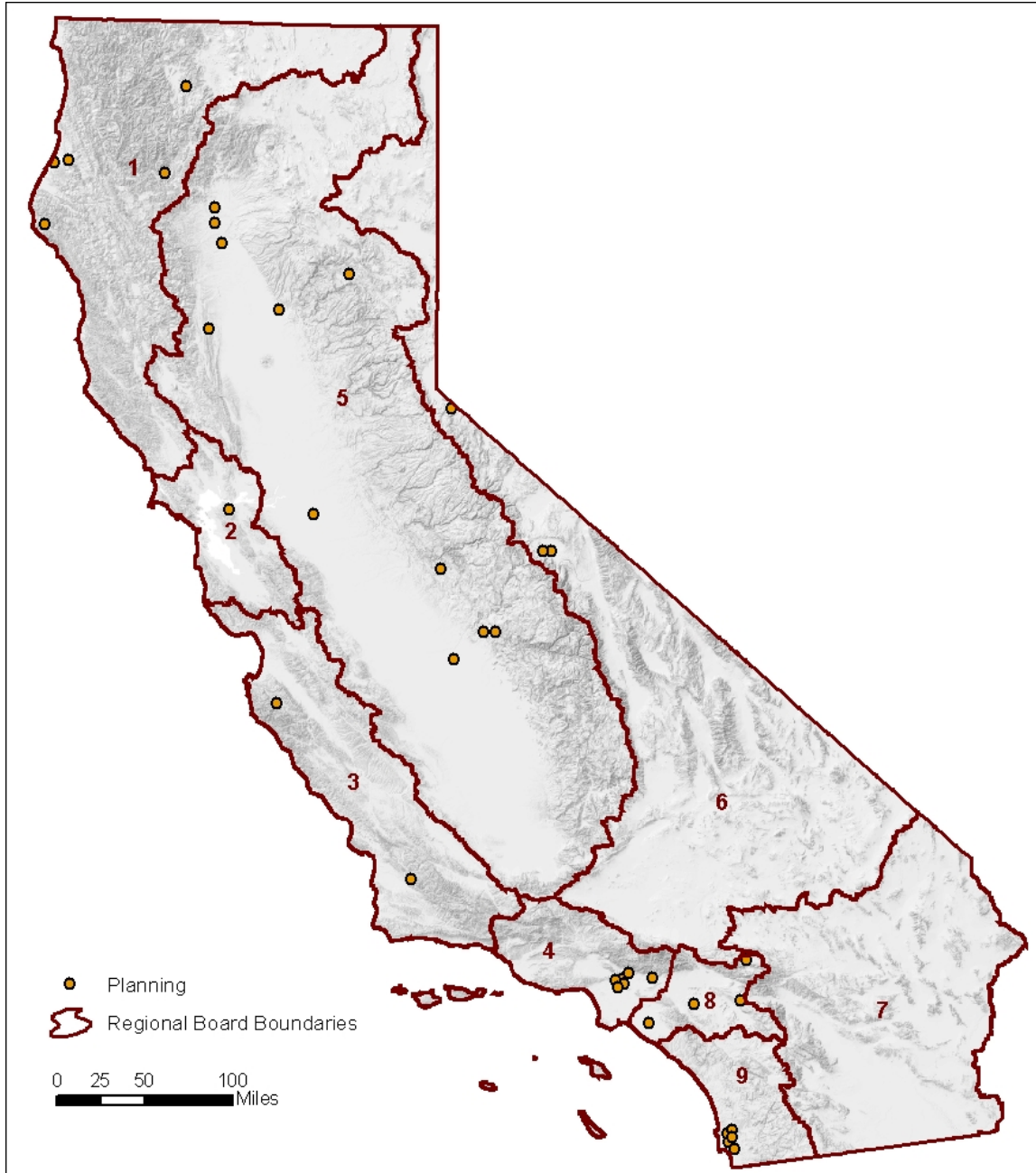
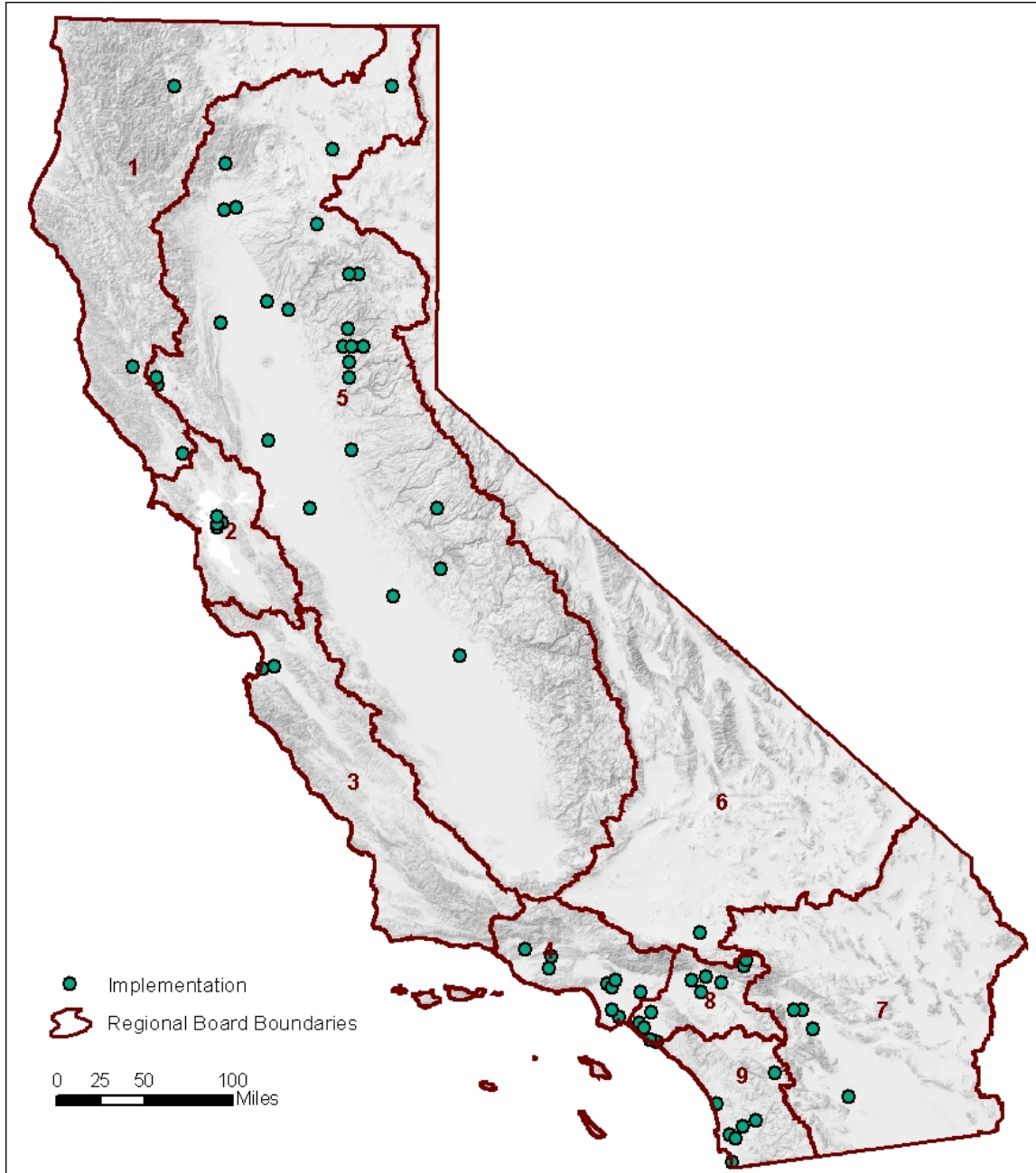


Figure 2- Watershed Protection Program Implementation Projects



Explanation of Tables

Projects are listed below in the approximate order in which they were funded. The “Region” column denotes the Regional Water Board where the project was located; and in most cases the project was managed by staff at that Regional Water Board. The 31 CALFED Watershed Program projects are noted below with a “c” after the project number, and were mostly managed by Regional Water Board staff. Planning projects are all completed except for numbers 42 and 43.

Immediately below the tables are details on the how these projects achieved the goals of the Watershed Protection Program of Proposition 13.

Regional Water Quality Control Boards

Region 1	North Coast Region
Region 2	San Francisco Bay Region
Region 3	Central Coast Region
Region 4	Los Angeles Region
Region 5	Central Valley Region (S=Sacramento; R=Redding; F=Fresno)
Region 6	Lahontan Region (SLT= South Lake Tahoe; V=Victorville)
Region 7	Colorado River Basin Region
Region 8	Santa Ana Region
Region 9	San Diego Region

Table 1. Set-aside Projects

Project #	Project Title	Grantee	Cost	Region
1	Pajaro River Watershed Study (Attachment A Page 1)	Pajaro River Watershed Flood Prevention Authority	\$2,000,000	3
2	Clover Creek Flood Protection and Environmental Enhancement Project (Attachment A Page 3)	City of Redding	\$5,000,000	5
3	Russian River Watershed Project (Attachment A Page 4)	Sonoma County Water Agency	\$1,000,000	1
4	Clearlake Basin 2000 Project (Attachment A Page 6)	Lake County Sanitation District	\$2,000,000	5

Table 2. Planning Projects

Project #	Project Title	Grantee	Cost	Region
5	Dominguez Channel WMP (Master)	Los Angeles County, Dept of Public Works	\$200,000	4
6	Sulphur Creek Watershed Assessment and Restoration Strategy (Attachment A Page 7)	Plumas Corporation	\$176,606	5R
7	San Antonio Creek Coordinated Resource Management Plan	Cachuma Resource Conservation District	\$200,000	3
8	Scott River Planning and Assessment (Attachment A Page 8)	Siskiyou Resource Conservation District	\$185,621	1
9	San Diego River Watershed Management Plan	San Diego County Dept of Environmental Health	\$183,443	9
10	Good Roads/Clear Creeks Program	Mattole Restoration Council	\$197,144	1
11	Ishi-Pishi Restoration Plan	Northern California Indian Dev. Council, Inc.	\$199,537	1
12	Ballona Creek Watershed Management Plan	Los Angeles County Department of Public Works	\$200,000	4
13	Butte County Integrated Watershed Planning	Butte County	\$191,548	5R
14	Los Penasquitos Master Watershed Management Plan	City of San Diego, City Of Del Mar, City Of Poway, County Of San Diego	\$200,000	9
15	San Jacinto Watershed Management Plan	Lake Elsinore and San Jacinto Watershed Authority	\$200,000	8
16	Watershed Management Plan for San Gabriel River Above Whittier Narrows	San Gabriel Mountains Regional Conservancy	\$200,000	4
17	Otay River Watershed Management Plan	County of San Diego	\$200,000	9
18	Santa Margarita Watershed Management Plan	San Diego County Flood Control District	\$200,000	9

Project #	Project Title	Grantee	Cost	Region
19	Carmel River Watershed Management Plan	Carmel River Watershed Conservancy	\$197,280	3
20	Tijuana River Watershed Management Plan	San Diego County Flood Control District	\$200,000	9
21	Upper Carson Watershed Stream Corridor Condition Assessment	Sierra Valley Alliance	\$200,000	6SLT
22	Lindsay Creek, Mad River Watershed	Redwood Community Action Agency	\$200,000	1
23	Big Bear Lake Watershed Restoration Plan	Big Bear Municipal Water District	\$200,000	8
24	Rio Hondo River Watershed Management Plan	San Gabriel Valley Council of Governments	\$200,000	4
25	Compton Creek Watershed Management Plan	LA and San Gabriel Rivers Watershed Council	\$179,656	4
26	Arroyo Seco Watershed Management and Restoration Plan	North East Trees	\$199,703	4
27	San Timoteo Watershed Management Program	San Timoteo Watershed Management Authority	\$195,000	8
28	Coyote Creek Watershed Management Plan	County of Orange	\$200,000	8
29	Contra Costa County Watershed Inventory and Creeks Restoration Strategy	Contra Costa County Community Development Department	\$80,000	2
30	West Walker Watershed Management Plan	Mono County	\$198,000	6SLT
31	Mono Basin and Upper Owens Watershed Management Plans	Mono County	\$198,000	6SLT
32c	Bear Creek Watershed Assessment	Western Shasta Resource Conservation District	\$140,660	5R
33c	Upper Spanish Creek Watershed Assessment and Restoration Strategy	Plumas Corporation	\$170,000	5R

Project #	Project Title	Grantee	Cost	Region
34c	Finegold Watershed Planning	Sierra Foothill Conservancy	\$102,971	5F
35c	Cottonwood Creek Watershed Management Program	Cottonwood Creek Watershed Group	\$200,000	5R
36c	Upper Merced River Watershed Management Plan	Mariposa County Resource Conservation District	\$199,729	5F
37c	Tehama West Watershed Assessment	Tehama County Resource Conservation District	\$199,500	5R
38c	Upper Trinity River Watershed Management Planning Project	Trinity County Resource Conservation District	\$200,000	1
39c	The Stewards of the Arroyo Pasajero CRMP: Sharing our Success	Westside Resource Conservation District	\$39,269	5F
40c	Stony Creek Watershed Management Program	Glenn County Resource Conservation District	\$189,586	5R
41c	Upper Mokelumne River Watershed Assessment	Upper Mokelumne River Watershed Authority	\$200,000	5S
42	Millerton Area Watershed Action Plan	Sierra Foothill Conservancy	\$200,000	5F
43	Supplemental Carmel River Watershed Action Plan	Planning And Conservation League Foundation	\$30,000	3

Table 3. Implementation Projects

Projects #44 to #70 have been completed.

Project #	Project Title	Grantee	Cost	Region
44	Regional Wetlands And Watershed Management Plan For Coastal Southern California (Attachment A Page 9)	Environment Now	\$607,500	9
45	Reducing Eutrophic Conditions at the Salton Sea (Attachment A Page 10)	Salton Sea Authority	\$490,247	7
46	Vegetative Conservation Practices for Water Quality and Habitat Diversity on Pajaro Valley Farms (Attachment A Page 13)	Community Alliance with Family Farmers	\$331,298	3
47	French Creek Riparian Protection and Enhancement Project (Attachment A Page 15)	Siskiyou Resource Conservation District	\$84,520	1
48	Cherokee Watershed Water Quality Monitoring Project (Attachment A Page 18)	Butte County	\$168,871	5R
49	Bluewaterhole Road Sediment Reduction Project (Attachment A Page 19)	Mendocino County Resource Conservation District	\$72,760	1
50	Nutrient Remediation Program to Implement Big Bear Lake TMDL	Big Bear Municipal Water District	\$80,000	8
51	Infiltration of Urban Runoff Demonstration Program	LA-San Gabriel River Watershed Council	\$985,000	4
52	San Diego Creek Sediment Basin and Weir Construction (Attachment A Page 20)	County of Orange	\$816,250	8
53	Upper San Luis Rey Watershed Arundo Control And Riparian Habitat Restoration (Attachment A Page 22)	Mission Resource Conservation District	\$911,000	9
54c	Lower Clear Creek Spawning Gravel Injection	Western Shasta Resource Conservation District	\$335,489	5R
55c	Restoring Deer Creek: Building Partnerships to Overcome the Legacy of Goldrush Era (Attachment A Page 24)	Friends of Deer Creek	\$360,000	5S

Project #	Project Title	Grantee	Cost	Region
56	GIS Mapping to Implement Drainage Management Plan	County of San Bernardino	\$490,000	8
57c	Water Quality Improvement in Cow Creek Watershed (Attachment A Page 26)	Western Shasta Resource Conservation District	\$66,446	5R
58	Sediment Phosphorous Control Program in Big Bear Lake (Attachment A Page 28)	Big Bear Municipal Water District	\$500,000	8
59	Hamilton Bowl Trash Reduction Project (Attachment A Page 29)	City of Signal Hill	\$783,000	4
60	Torres Martinez/Salton Sea NPS Nutrient Project (Attachment A Page 32)	Torres Martinez Desert Cahuilla Indian Tribe	\$150,000	7
61c	Plymouth Area Vineyard Erosion Control	Sonoma Ecology Center	\$451,500	5S
62	Fats, Oils, Grease Control Study to Reduce Sanitary Sewer Overflows (Attachment A Page 33)	Orange County Sanitation District	\$250,000	8
63c	Upper Pit River Watershed Enhancement and Protection Project	Central Modoc Resource Conservation District	\$585,580	5R
64	Tijuana River Valley Invasive Plant Control Program	Southwest Wetlands Interpretive Association	\$1,112,936	9
65c	Yuba River Citizen Monitoring Program Phase II (Attachment A Page 35)	South Yuba River Citizens League (SYRCL)	\$214,201	5S
66	San Diego River Park-Lakeside Conservancy Restoration and Recharge Project (Attachment A Page 36)	Lakeside River Park Conservancy	\$1,290,725	9
67	El Rio Sewer System Project (Attachment A Page 37)	County Of Ventura	\$2,430,000	4
68c	Panoche Creek Stabilization Project	Westside Resource Conservation District	\$200,000	5F
69c	Colfax Community Watershed and Fire Safe Ecosystem Project	City of Colfax	\$92,035	5S
70c	North Yuba River Watershed Improvement: Abandoned Mine Reclamation and Restoration (Attachment A Page 38)	Sierra County Board of Supervisors	\$209,591	5S

All projects below are still active

Project #	Project Title	Grantee	Cost	Region
71	Tijuana River Watershed Invasive Species Removal Project	County of San Diego Department of Public Works Watershed Protection Program	\$637,500	9
72c	Glenn County Surface Water Stewardship	Glenn County Department of Agriculture	\$275,000	5S
73c	A WRAP for Wildcat/San Pablo Creeks	Urban Creeks Council	\$750,000	2
74c	Enhancing Local Capacity in No. Richmond & Parchester Village to Manage & Restore the Lower Rheem Creek Watershed	Natural Heritage Institute	\$440,870	2
75c	Deer Creek Watershed Erosion and Sediment Control Project - Phase II Implementation	Deer Creek Watershed Conservancy	\$493,175	5R
76c	Small is Beautiful - Scaling Adaptive Management to Fit a Range of Riverine system Restoration Projects	Natural Heritage Institute	\$183,500	State
77c	Oakland Releaf Watershed Protection Program	Oakland Releaf	\$350,000	2
78	San Gabriel Watershed Nonpoint Pollution Reduction Program	Upper San Gabriel Valley Municipal Water District	\$205,275	4
79c	Clear Lake Watershed Mercury and Nutrient Assessment	Lake County Flood Control and Water Conservation District	\$147,182	5S
80c	South Yuba Watershed Project	Nevada County Land Trust	\$300,536	5S
81c	Putah Creek - Yolo Housing Authority Project	Solano County Water Agency	\$279,655	5S
82c	Invasive Species Inventory, Eradication and Monitoring	Lake County Flood Control and Water Conservation District	\$181,262	5S

Project #	Project Title	Grantee	Cost	Region
83	Cathedral City Dream Homes Septic System Elimination Project	City of Cathedral City	\$848,300	7
84	Cathedral City Cove Septic Elimination Phase Two	City of Cathedral City	\$2,500,000	7
85	The Merced River Alliance Project	East Merced Resource Conservation District	\$2,299,977	5F
86	Modifying Agriculture Practices to Reduce Nutrient and Pesticide Loading Calleguas Creek and Lower Santa Clara River	United Water Conservation District	\$820,239	4
87	Assessment of Water Quality Loadings from Natural Landscapes	Southern California Coastal Water Research Project	\$919,502	4
88	Big Canyon Creek Restoration Project	City of Newport Beach	\$200,000	8
89	Restoration of Riparian/Wetlands Habitat in the Carlsbad Hydrologic Unit	San Elijo Lagoon Cons. (SELC) on behalf of the Carlsbad Watershed Net.	\$3,960,000	9
90	Community Water-Use Efficiency Education and Training (WET) Project	Executive Partnership for Environmental Resources Training	\$754,600	4
91	Calleguas Regional Salinity Management Project	Calleguas Municipal Water District	\$2,230,000	4
92	El Rio Sewer System Project (II)	County of Ventura	\$2,500,000	4
93	Ballona Creek Stormwater Trash Capture System	City of Los Angeles Department of Public Works	\$1,400,000	4
94	Lake Perris Dissolved Oxygen Enhancement Project	The Metropolitan Water District of Southern CA	\$3,000,000	8
95	Chino Creek Park Wetlands and Ecosystem Restoration Project	Inland Empire Utilities Agency	\$1,196,900	8
96	Mojave River Watershed Invasive Weed Management Planning and Mapping Project	Mojave Desert Resource Conservation District	\$191,523	6SLT
97	Forester Creek Improvement Project	City of Santee	\$3,000,000	9

Project #	Project Title	Grantee	Cost	Region
98	San Diego River Park - Restoration and Recharge - Phase II	San Diego River Park-Lakeside Conservancy	\$1,105,700	9
99	The Lower Mokelumne River Watershed Stewardship Plan	San Joaquin County Resource Conservation District	\$1,377,884	5S
100	Red Clover Creek/McRenolds Restoration Project	Plumas Corporation	\$1,101,000	5R
101	Pit RCD Watershed Management Project	Pit River Watershed Alliance	\$305,000	5R
102	Plumas County Lake Almanor Watershed Planning and NPS Control Proposal	Plumas County Flood Control and Conservation District	\$615,200	5R
103	Caulerpa taxifolia Surveillance and Eradication Program	Agua Hedionda Lagoon Foundation	\$2,266,000	9
104c	Codornices Creek Watershed Restoration Actions, Stage 2	Urban Creeks Council	\$482,500	2
105c	Baxter Creek Restoration	City of El Cerrito	\$492,042	2
106	Integrated Ecosystem Improvements for Shasta County Watersheds	Western Shasta Resource Conservation District	\$821,727	5R
107	Building a Sustainable Upper Merced River Watershed Organization	Mariposa County Resource Conservation District	\$271,080	5F
108	Stony Creek Watershed Assessment and Watershed Monitoring Program	Glenn County Resource Conservation District	\$763,200	5R
109	Chico Urban Streams Alliance Clean Creeks Project	City of Chico	\$400,714	5R
110	Deer Creek Watershed Management Plan Implementation: Phase III.	Deer Creek Watershed Conservancy	\$457,150	5R
111	Newport Coast Watershed Program: Assessment Management and Restoration	City of Newport Beach	\$1,100,000	8
112	Big Bear Lake Sediment Load Reduction Program	East Valley Resource Conservation District	\$250,208	8
113	San Diego Watershed Ambient Water Quality Monitoring by Citizens	San Diego State University Foundation	\$497,798	9

Project #	Project Title	Grantee	Cost	Region
114	San Jacinto Watershed Improvement and Protection Program	County of Riverside	\$2,617,602	8
115	Integrated TMDL Implementation Program for Big Bear Lake	Big Bear Municipal Water District	\$2,300,000	8

Achievement of Proposition 13 goals

The specific purpose of this Proposition 13 program is to provide funds to assist in implementing projects identified in existing Local Watershed Management Plans that do the following tasks:

1. Reduce flooding;
2. Control erosion;
3. Improve water quality;
4. Improve aquatic and terrestrial species habitats;
5. Restore natural systems of groundwater recharge, native vegetation, water flows, and riparian zones;
6. Restore the beneficial uses of waters of the State in watersheds; and
7. Provide matching funds for federal grant programs.

The WPP funded a suite of projects as diverse as the watersheds they support. About 10 percent of the funds for this program were used to develop the Watershed Management Plans (WMPs) that could then be used to support future implementation projects. These planning projects are described in Table 2 (Projects 5 through 43). Most WMPs are developed to address all seven of the tasks listed above. However, given the great differences between watersheds in California, the issues of most relevance in a specific watershed would receive the primary focus during development of that Local WMP. For example, projects in forested areas in the northern parts of the State would focus mostly on issues of erosion control and improving aquatic, riparian, and terrestrial habitats (e.g., Projects 6, 8, and 11). Plans developed in Southern California watersheds may have a larger focus on issues of stormwater, flooding, and groundwater recharge.

The majority of Program funds went to support projects that implemented local WMPs. While all WMPs are designed to be comprehensive, many of the implementation projects only focused on a single, key watershed issue (e.g., control erosion or improved water quality). For example, Project 1 mostly focused on flooding issues while Project 44 focused on wetlands protection and restoration.

Tasks 1-6, above, are mostly achieved by the implementation of Best Management Practices (BMPs), and in some cases by construction of facilities (e.g., sewer treatment plants, impoundments), or a combination of the two approaches. The specific types of BMPs most commonly used in these projects are discussed below by task, however many BMPs serve to achieve multiple objectives (e.g., replanting of upland areas above streams can control erosion, restore native vegetation, and reduce flooding).

Reduced flooding is addressed by: 1) creation of detention and infiltration basins; 2) restoration of wetlands and native riparian vegetation; 3) removal of invasive species; 4) reduction of upstream sediment sources; and 5) restoration of original stream hydrology. Many of these methods are also used to control erosion, as are other BMPs such as: stormwater treatment and diversion; improved grazing and farming practices; use of filter strips, hedgerows, and buffers; reconstruction of roads and culverts; etc.

Improvement of aquatic and terrestrial habitat (Task 4) and restoration of natural groundwater recharge, native vegetation, water flows, and riparian zones (Task 5) also use many of the BMPs and methods discussed above for controlling flooding and erosion. Reestablishment of natural habitats is a newly developing science and the WPP and similar funding programs in the last decade have supported the testing of many innovative biological and hydrological techniques. Basic features include removing non-native vegetation, determining what the original biological communities were in the area, repairing man-made damages, reducing upstream sources of pollution, reestablishing an appropriate hydrologic regime, and replanting the desired plant and animal communities.

Projects that were primarily designed to improve water quality usually focused on only one or two critical pollutants or sources. For example, some projects mostly addressed problems from urban wastewater treatment plants (e.g., Projects 4, 67, 83, and 84). Some addressed specific pollutants. For example, phosphorous control was the main focus of Projects 45 and 58. Sediment control was the main focus of several projects including Projects 49 and 52. Agricultural sources of pollution were the focus of Projects 46 and 86.

Implementation projects that address in-stream and riparian restoration issues almost always address to some extent the other tasks listed above. Erosion control, water quality, flood control, and restoring beneficial uses are tasks that are normally integral to a habitat restoration project. Examples of these types of projects include Projects 47, 53, and 66. One common type of restoration project focuses on elimination of the invasive species that can cause water quality, flood control, and habitat problems (e.g., Projects 64, 71, 82, 103).

A final type of project that indirectly supports many of the tasks listed above is one that produces critical monitoring and assessment information. Although this type of project may blur the boundary between planning and implementation projects, most existing local WMPs identify the need to have better monitoring and assessment of specific water quality and environmental conditions in the watershed as a high priority. Examples of these include Projects 48, 57, 60, 65, and 79.

Finally, most of the projects discussed in this Report had components of education, outreach, and public involvement. These components are vital to ensuring that the project succeeds, and in most cases a long-term public involvement process would be put into place to allow the project to continue to produce environmental benefits after the grant funding has finished. Public involvement is a key feature of most of the restoration type projects in order to bring together the many stakeholders in the watershed to agree on the details of the project.

All the implementation projects had to have been identified in an existing WMP in order to get funded. By definition, the process of developing a local WMP includes a major stakeholder involvement component to set the priorities for projects in the watershed as well as to define the goals and objectives for environmental improvement in the watershed. Social and economic aspects of implementation projects are also considered during the watershed and project planning phases.

ATTACHMENT A

Watershed Protection Program Biennial Report to the Governor

Summaries of completed Watershed Protection Program Projects

Listed by project numbers from the WPP Biennial Report Tables

1. Pajaro River Watershed Study
2. Clover Creek Flood Protection and Environmental Enhancement Project
3. Russian River Watershed Project
4. Clearlake Basin 2000 Project
6. Sulphur Creek Watershed Assessment and Restoration Strategy
8. Scott River Planning and Assessment
44. Regional Wetlands And Watershed Management Plan For Coastal Southern California
45. Reducing Eutrophic Conditions at the Salton Sea
46. Vegetative Conservation Practices for Water Quality and Habitat Diversity on Pajaro Valley Farms
47. French Creek Riparian Protection and Enhancement Project
48. Cherokee Watershed Water Quality Monitoring Project
49. Bluewaterhole Road Sediment Reduction Project
52. San Diego Creek Sediment Basin and Weir Construction
53. Upper San Luis Rey Watershed Arundo Control And Riparian Habitat Restoration
55. Restoring Deer Creek: Building Partnerships to Overcome the Legacy of Goldrush Era
57. Water Quality Improvement in Cow Creek Watershed
58. Sediment Phosphorous Control Program in Big Bear Lake
59. Hamilton Bowl Trash Reduction Project
60. Torres Martinez/Salton Sea NPS Nutrient Project
62. Fats, Oils, Grease Control Study to Reduce Sanitary Sewer Overflows
65. Yuba River Water Quality Monitoring Project, Phase II
66. San Diego River Park-Lakeside Conservancy Restoration and Recharge Project
67. El Rio Sewer System Project
70. North Yuba River Watershed Improvement: Abandoned Mine Reclamation and Restoration

Pajaro River Watershed Study

Pajaro River Watershed Flood Prevention Authority

Award Amount: \$2,000,000

Watershed: Pajaro River (County of Monterey, County of San Benito, County of Santa Clara, County of Santa Cruz)

Water Board Region: Central Coast Regional Water Quality Control Board

Project Goals:

The goals of this project were to identify, evaluate, fund, and implement flood prevention and control strategies in the Pajaro River Watershed. The project was divided into the following phases:

Phase 1 – Streamflow Modeling

Phase 2 – Identification and Evaluation of Alternatives

Phase 3 – Selection of Projects

Phase 4 – Preliminary Design of Projects

Phase 5 – Soap Lake Project Extension and Related Studies

Project Outcomes:

Phase 1- Stream Flow Modeling

The hydrologic and sediment regimes of the watershed were modeled. This provided a better understanding of the effects that land use changes over time have on flooding frequency and magnitude.

Phase 2- Development of Flood Protection Alternatives

Project alternatives that would provide protection for the Pajaro River from the 100-year flood flows identified in Phase 1 were developed. These alternatives included conveyance and storage methods of protection.

Phase 3- Selection of Projects and CEQA Analysis

Soap Lake Floodplain Preservation Project was identified as critical to the Army Corps of Engineers downstream flood prevention projects. The CEQA document and other studies including definition of the floodplain were prepared.

Phase 4- Flood Protection Implementation

An implementation plan for the selected project was developed and the CEQA document finalized. Evaluation studies of sediment impacts, flood forecasting capabilities, and fisheries conditions were completed.

Phase 5- Soap Lake Project Extension and Related Studies

The four major tasks of this project contributed to flood protection for the Pajaro River Watershed. These four tasks included:

1. Soap Lake Floodplain Preservation Project Implementation Plan: This task defined an implementation plan for the preferred project identified and analyzed in Phase 3 of this study. A land acquisition strategy and program was developed and conservation easement provisions created. Funding opportunities for the Soap Lake Floodplain Preservation Project and action items for each county were identified in this report.
2. Pajaro River Watershed Sediment Studies: Three models were created for this task. The Sediment Trap Feasibility Analysis evaluated the feasibility of using upstream sediment trapping to limit excess sediment delivery and deposition in the lower channel. In a separate study, a two-dimensional hydraulic and sediment transport model assessed the feasibility of using lowered benches cut into the Pajaro River banks to act as vegetation corridors and sediment trapping areas. The third model determined the sediment flux to the Pajaro River from the San Benito River for various frequency floods in the lower San Benito River.
3. Improve Flood Forecasting Capability: There were several areas of capability improvement made available in the Pajaro River Watershed. A new rating curve of the flow gauge on the San Benito River at Highway 156 was developed and compared to the existing rating curve. Streamflow, rainfall, and reservoir gauges in the Pajaro River Watershed were evaluated as elements within the existing ALERT system. Time-of-travel curves were developed to supplement the ALERT system within the watershed. Existing streamflow gauges on Pacheco Creek at Walnut Avenue in Santa Clara County and on the San Benito River at Willow Creek in San Benito County were evaluated for potential rehabilitation and upgrade options.
4. Fisheries Study of San Felipe Lake: This task provided baseline information for local species and habitat for use in future analyses and studies. The Fisheries Study determined which anadromous and other fish species inhabit San Felipe Lake and use Miller's Canal as a migration route. The findings of this study provide the background information necessary to pursue a more focused investigation of the fisheries in the greater Soap Lake region.

Clover Creek Flood Protection and Environmental Enhancement Project

City of Redding

Award Amount: \$5,000,000

Watershed: Clover Creek Watersheds (Shasta County)

Water Board Region: Central Valley Regional Water Quality Control Board

Project Goals

The purpose of the project was to prevent flooding by creating a 46-acre detention basin on 128 acres of land and bypassing 3500 feet of Clover Creek with a 60" to 72" storm drain pipe. In addition, new wetlands, vernal pools, a lake, seasonal stream and 2 miles of hiking trails and 2.5 miles of paved bicycle path were to be created.

Project Outcomes

- The storm drain system was constructed and will convey approximately 133 cubic feet per second (cfs). Also, about 25 cfs will flow out of the basin immediately downstream of a dike into the existing stream channel that is estimated to be able to adequately handle up to 90 cfs.
- A seasonal creek 2700 feet in length was created in the basin along with another 2700 feet of diversion stream.
- Eight acres of new wetlands was created in the Blue Oak Enhancement area.
- A 6.7 acre year-round lake will be created in the basin fed continuously from a redeveloped water well. This lake will be used to provide irrigation water for the drip irrigation system installed to help the new native plantings become established.
- 22,000 plants have been planted including 8,000 oak trees.
- Two miles of 6 feet wide decomposed granite hiking trail with interpretative signage was constructed.
- A perimeter 12-foot wide asphalt concrete bike path nearly 2.5 miles long was constructed.

Russian River Watershed Project

Sonoma County Water Agency

Award Amount: \$1,000,000

Watershed: Russian River (Sonoma County)

Water Board Region: North Coast Regional Water Quality Control Board

Project Goals

The Project goals were to significantly improve the health of the Russian River with watershed restoration efforts. This project helped restore listed salmonid habitat in the watershed, and addressed other restoration and water quality considerations in the riparian corridor.

Project Outcomes

Rancho Cotati High School Project

Conducted water quality monitoring of the Southern Laguna Tributaries of the Russian River Watershed. The monitoring provided useful data on the four creeks traversing Rohnert Park that empty into the Laguna de Santa Rosa.

Willow Creek Watershed Project

Produced a Watershed Management Plan and Channel Feasibility Analysis that included four years of water quality monitoring data from three locations in the watershed. Continued on-going education and service learning projects for 5-10 classes each year through the Watershed Education Program.

Environmental Education

High school and elementary school students installed 1,650 plants and propagated 10,000 plants. Project monitoring and bioassessment was done over a five-year period that produced real data to be used to measure the effectiveness of the restoration sites.

Donnels Property Sediment and Rehabilitation Analysis

The Donnels dam site was monitored for five years and included measurement and photo analysis by LandPaths. This site has been the major source of fine sediment in the upper Santa Rosa Creek watershed since its construction over 40 years ago.

Copeland Creek Watershed Assessment

The Sotoyome Resource Conservation District prepared a comprehensive assessment of the Copeland Creek Watershed.

Giant Reed Removal Project

Over 50 acres of arundo donax were removed. Private landowners were educated in identification and removal techniques to increase project sustainability. On-site composting of the invasive weed occurred at several sites to lessen the need to burn or dump the large amounts of biomass generated in the removal process.

Asti Stream bank Stabilization and Riparian Re-vegetation Project

1200 feet of stream bank were stabilized to increase the ability of salmonids and other riverine animals to migrate. Educational interpretive panels were been installed at the site.

Lower Green Valley Creek Habitat Restoration and Enhancement Project

Conducted riparian plantings of about 540 native-species trees and got four-year agreements with private landholders to exclude livestock from the area to allow tree growth. Approximately 2400 feet of riparian habitat was restored.

Russian River Cleanup

The Russian River Watershed Cleanup Committee annually sponsored a volunteer Clean Up Day of the Russian River Watershed from Cloverdale to Jenner. About 340 volunteers along with various other agencies combed the river's main stem and tributaries removing debris.

Clear Lake Basin 2000 Project

Lake County Sanitation District

Award Amount: \$2,000,000

Watershed: Clear Lake (Lake County)

Water Board Region: Central Valley Regional Water Quality Control Board

Project Goals

Lake County Sanitation District's (LACOSAN) Clear Lake Basin 2000 Project is a clean water initiative to upgrade wastewater collection and treatment, and recycle effluent to improve Clear Lake water quality, create wildlife habitat in constructed wetlands, and generate geothermal power. The first phase of the initiative has been operating since 1997. This current phase went into full operation in January 2003.

Project Outcomes

The Proposition 13 funded approximately 66% of the construction cost of upgrading LACOSAN's Northwest Regional Wastewater Treatment Plant. Treatment plant improvements included: earthwork, aerated lagoon cells, junction boxes, sodium hypochlorite feed system, site work, and yard piping.

The original treatment system had reached its hydraulic capacity by the late 1980's and could no longer contain treated wastewater in its effluent storage reservoir. This resulted in several treated effluent discharges into Clear Lake that violated LACOSAN's waste discharge permit. The Central Valley Regional Water Quality Control Board placed a sewer connection moratorium on the facility in 1994. This moratorium was not to be removed until the system improvements mentioned had been completed. The improvements from this project resulted in the Central Valley Regional Water Quality Control Board removing the connection moratorium on March 14, 2003. The removal of the moratorium allowed the growth planned for in the Lake County General Plan to proceed.

The average dry weather flow treatment capacity of the new treatment system is 2 million gallons per day (mgd). The average wet weather flow (awwf) 1-in-10 year capacity is 3.8 mgd. The awwf 1-in-100 year capacity is 4.1 mgd. The peak month average capacity is 5.6 mgd; peak day capacity is 8.5 mgd; and peak hour capacity is 10 mgd. With the 21-mile effluent recycling pipeline in operation, the system is able to deliver 4 mgd to the existing Geysers Effluent Pipeline to enhance electricity production from the Geysers production area.

Sulphur Creek Watershed Assessment and Restoration Strategy

Plumas Corporation

Award Amount: \$176,606

Watershed: Sulphur Creek (Plumas County)

Water Board Region: Central Valley Regional Water Quality Control Board

Project Goals

The goal of this project was to address active erosion of stream banks in the watershed. Landowners had approached the Feather River Coordinated Resources Management Group for assistance. This project investigated the causes of erosion and developed a prioritized watershed-wide strategy to implement restoration.

Project Outcomes

Sulphur Creek Watershed Restoration Strategy

A restoration strategy was developed based on the following items: 1) a set of desired conditions for the Sulphur Creek watershed, 2) opportunities within the watershed, 3) constraints that may hinder or reduce achievement of the desired conditions, 4) a ranking system was developed for highest priority areas and projects which would be periodically updated to meet social and economic changes, changes in the watershed.

A listing of potential projects was developed to address the following areas: 1) Middle Sulphur at Barry (sediment reduction); 2) High Risk Tributary Stream Channels (sediment reduction, erosion reduction, and restore tributary channels and floodplains); 3) Mohawk-Chapman Road (reduce size and intensity of debris flows); 4) Whitehawk Ranch Reach (stream channel and floodplain restoration); 5) Livestock Management; 6) Lower Sulphur Creek Reach (stream channel and floodplain restoration); 7) Sulphur Creek Constriction near confluence with the Middle Fork Feather River (channel and flow restoration); 8) Bridges (replace bridge and channel adjustments); 9) McNair Meadow (restoration); 10) Yarrington Meadow restoration; and 11) Roads (reconfigure roads, drainage, and streamflows).

Citizen's Monitoring

Volunteers provided services to conduct flow measurements, and water quality testing for dissolved oxygen, pH, turbidity, and temperature.

Scott River Watershed Planning and Assessment

Siskiyou Resource Conservation District

Award Amount: \$185,621

Watershed: Scott River (Siskiyou County)

Water Board Region: North Coast Regional Water Quality Control Board

Project Goals

The project goals were twofold, first to: coordinate and draft the *Scott River Strategic Action Plan*, with the over-all goal of improving the effectiveness of natural resource protection and enhancement projects; and second to complete a watershed level assessment of in-stream habitat, and collect baseline data on water quality, habitat, and stream flow. This data will provide scientific guidelines for future restoration project development and prioritization. In addition, this information will help identify stream reaches with the most fish habitat restoration potential.

Project Outcomes

Photo point monitoring at Dockery Gulch

Photo points were established in Dockery Gulch depicting each enhancement project site. These photo points will serve to represent changes in vegetation types in the treatment plots over time. No significant difference in vegetation was seen in the two years since the treatment but future monitoring is needed. These photo points will be useful for long-term (5-10 year) monitoring of the treatment sites.

Well levels

Well levels in Dockery Gulch were measured approximately every 10 days. The typical pattern in the Scott Valley is for well levels to be highest in the spring following winter rains and lowest in the fall. Well levels rise with the fall rains and dormancy of plants, and reach the highest level in late spring. Well log levels collected during this project indicate that the well in Dockery Gulch did not recover to spring levels in 2004, compared to the same period in 2003 (a difference of 7.6 feet deeper in 2004). Precipitation data collected at the USFS station indicates that precipitation at Fort Jones is below the 30-year average at that location, with 2004 receiving less than 2003. However, given the short time frame of monitoring, the baseline recharge state is not known. Additional years worth of data will need to be collected to sort climate effects from vegetation effects. A rain gage was placed in Dockery Gulch in November 2003 to provide further site-specific precipitation data. It may be needed to revisit the treatment sites to remove any encroaching brush.

Regional Wetlands and Watershed Management Plan for Coastal Southern California

Environment Now

Award Amount: \$607,500

Watershed: Santa Barbara, Ventura, Los Angeles, Orange, and San Diego County watersheds

Water Board Region: San Diego Regional Water Quality Control Board

Project Goals

The purpose of this grant is to provide a regional watershed planning assessment, an inventory of restoration projects, a Southern California volunteer network, a model watershed ordinance, and a regional wetlands and watershed plan for Southern California. This will help to achieve the goals of: (1) preserving and restoring coastal wetland ecosystems; (2) preserving and restoring stream corridors and wetland ecosystems in coastal watersheds; (3) recovering native species diversity; (4) integrating wetlands recovery in other public objectives; (5) promoting education and compatible access related to coastal wetlands and watersheds; and (6) advancing the science of wetlands restoration and management in Southern California.

Project Outcomes

The general purpose of the grant was to coordinate watershed planning on a regional basis. The watershed coordinators identified some key gaps related to watershed issues in each county (e.g., educational, institutional, technical assistance, planning, and project development) and encouraged others to help fill them. They identified and helped people write grants totaling over \$8 million of which about \$2.5 million was funded, and most of the rest is still under review. They engendered key cross-county work related to Rincon Creek (Santa Barbara/Ventura), the Santa Clara River (Ventura/Los Angeles), and the San Gabriel River (Los Angeles/Orange).

In addition, WaterWatch volunteers fanned out across the region teaching classes, cleaning up rivers, monitoring water quality and participating in restoration work. This established a network of elementary school teachers, university student organizations, and university faculty that can continue this work. Finally, the grant served to heighten appreciation for the role of local land use decision-making processes as a focus for wetlands and watershed protection and, in particular, helped to facilitate a pilot effort by the Ventura County Planning Department.

Reducing Eutrophic Conditions at the Salton Sea

Salton Sea Authority

Award Amount: \$490,247

Watershed: Salton Sea (Imperial County)

Water Board Region: Colorado River Basin Regional Water Quality Control Board

Project Goals

The overall goal of the project was to evaluate the efficacy of chemical flocculation and the Controlled Eutrophication Process (CEP) to remove phosphorous from tributaries that discharge into the Salton Sea and to determine whether positive synergies exist that make it prudent to utilize both these treatment strategies in tandem. Because internal phosphorous loading in the Salton Sea is low and external phosphorous loading to the Sea is high, reduction of tributary phosphorous loading to the Salton Sea may reduce eutrophication.

Project Outcomes

Pilot projects were performed to determine the efficacy of using alum and polyacrylamide (PAM) together, and Controlled Eutrophication Process (CEP) to treat agricultural drainage water (tail water) which currently discharges to the Alamo, New, and Whitewater Rivers, which then discharge to the Salton Sea.

The CEP was shown by the pilots to be capable of removing approximately 75% of the nutrients present in the Whitewater River. Removal of both nitrogen and phosphorus occur in the CEP process as opposed to only phosphorus removal with chemical treatments. The CEP concept requires significant capital costs, but after they are incurred the operational costs should be less than chemical treatments. The amount of land required for the CEP has been estimated in the past to be approximately 4,000 acres and may cost \$2,500 per acre if purchased. Constructing the CEP units, including labor and materials, will require a majority of the capital, estimated to be about \$22,500 per acre. The total estimate capital cost for construction of the CEP units on the Whitewater River would be roughly \$100,000.

CEP operating costs include labor, energy and chemicals. Labor may cost about \$3 million per year and chemicals approximately \$4 million per year. A primary settling chamber may be required in conjunction with the CEP (to remove heavy sand particles), which may add an additional \$10 million per year in operating cost. An approximate estimate is the CEP operating costs could amount to about \$17 million per year.

Based on very rough approximation, the following table provides a comparison of the three principal methods of phosphorus and sediment reduction, from the three major tributaries flowing into the Salton Sea examined during this study. These preliminary

figures indicate that the CEP method may be the less expensive approach, but there is considerable additional work to be done to determine whether this is in fact correct.

Method	Sediment Reduction	Total P Reduction	Initial Capital Cost	Annual Operating Cost
Alum Flocculant Additions (4mg Al/L)	80-90%	70-85%	N/A	\$52 million/yr.
PAM Flocculant Additions (2 mg/L)	95%	30%	N/A	\$36 million/yr.
Controlled Eutrophication (4,000 acres)	85-95%	70-80%	\$100 million	\$17 million/yr.

Reducing Eutrophic Conditions of the Salton Sea



Simulated drainage ditch construction.



Injection tubes dripping PAM and alum solutions into the inflow monk box and a view from the drain monk box.

Vegetative Conservation Practices for Water Quality and Habitat Diversity on Pajaro Valley Farms

Community Alliance With Family Farmers

Award Amount: \$331,298

Watershed: Pajaro River (Santa Cruz County)

Water Board Region: Central Coast Regional Water Quality Control Board

Project Goals

The project goals were to improve water quality and enhance habitat value by implementing Best Management Practices to:

- Reduce sediment transport by providing vegetated buffers between farmland and waterways that slow water flow and settle out sediment, thus reducing turbidity.
- Reduce nutrient load by providing hedgerows, and buffer strips of grass, sedge and rush, which perform nutrient uptake.
- Reduce runoff of pesticides that adhere to soil particles, reduce pesticide use by increasing biological pest control from beneficial insects in flowering hedgerows, and by monitoring and reporting to farmers on pest and beneficial populations.
- Improve habitat for beneficial insects, terrestrial animal and plant species.

Project Outcomes

This project successfully combined ecological restoration and conservation activities with farmer outreach and education to protect and improve surface and ground water quality in the Pajaro River watershed. The project brought together farmers, agricultural professionals and technical specialists who shaped a program that enabled farmers to implement practices and improve their stewardship of natural resources. The project accomplishments included:

- Installation of over 16,000 linear feet of hedgerows and grassed waterways.
- Prevention of sediment from entering the Pajaro River system and Monterey Bay.
- Overcoming technical and social barriers to non-crop vegetative plantings.
- Creation of a greater level of awareness and understanding of these practices among the population of farmers and the general public in California's Central Coast through outreach and publicity.
- Development of a color brochure entitled "Hedgerows: Benefits to Farmers, Benefits to Wildlife," in collaboration with the Santa Cruz Resource Conservation District.
- Through insect monitoring, the initial building of a quantitative base of knowledge about the use of four commonly used native plants by beneficial and pest insects.
- Developed new sampling strategies for water quality monitoring on Central Coast farms.

Vegetative Conservation Practices for Water Quality and Habitat Diversity on Pajaro Valley Farms



A grassed pond bank at Dutra Farms



Grass buffer strip and hedgerow two years after planting at High Ground Organics



A seeded roadway at Garroutte Farms

French Creek Riparian Protection and Enhancement Project

Siskiyou Resource Conservation District

Award Amount: \$84,520

Watershed: French Creek (Siskiyou County)

Water Board Region: North Coast Regional Water Quality Control Board

Project Goals

The goals of this project were to decrease sediment contribution and increase sediment trapping through riparian establishment/protection practices that will improve channel conditions throughout the approximately 4.5 miles of the project reach, and a portion of the Scott River main stem.

Project Outcomes

This project involved a multitude of improvements that were completed as follows:

- The installation of 20,400 feet of new riparian fence, and improvement of 2,200 feet of existing riparian fencing for a total of 22,600 feet. Livestock exclusion fencing was installed to provide continuous riparian protection along French and Miner Creek and the Scott River to keep livestock out of the riparian zones.
- Planting of 5.5 acres of riparian trees with the intention to: expand riparian width to reduce floodplain erosion, increase sediment trapping potential of riparian areas and develop contiguous riparian vegetation and eventual improved riparian canopy.
- Developed and installed two alternative stock watering systems to provide alternate source of water to livestock and eliminate the need to divert surface flows in the fall when diversions are at conflict with adult anadromous fish moving into the systems to spawn.
- Repaired and reprofiled irrigation ditch by piping through 480' of ditch where water loss is high.
- Completed two minor channel modification projects on the lower reaches of French Creek and on the Scott River to increase channel stability.

The riparian area is now protected from livestock for the first time in over 100 years. Water delivery efficiency and efficient use of water is an important component in improving water quality in these streams by improving stream flow volume. By improving delivery efficiency and providing efficient livestock watering systems as an

alternative to diverting surface flow, water quality and instream habitats are improved. The Siskiyou RCD has a long-term relationship with many of the participants in this project and is confident they will maintain and abide by the intent of the project.



Fencing Photopoint # 3 – Before



Fencing Photopoint # 3 – After



Ditch reconstruction – Before



Ditch reconstruction - After

Cherokee Watershed Water Quality Monitoring Project

Butte County

Award Amount: \$168,871

Watershed: Cherokee (Butte County)

Water Board Region: Central Valley Regional Water Quality Control Board

Project Goals

The project goals were to better manage and understand water issues in the Cherokee Watershed by doing the following:

1. Hire a Watershed Coordinator and build formal organizations;
2. Conduct outreach via watershed meetings and tours;
3. Initiate citizen monitoring training and sampling;
4. Retain water quality monitoring expertise to support citizen efforts; and
5. Gather and analyze data and produce reports.

Project Outcomes

The project achieved the creation of partnerships and public education events. Examples of partnerships that supported the success of public education and awareness include: 1) joining with the Butte County Resource Conservation District and three other watersheds in Butte County in the successful application for Department of Conservation funding to support ongoing watershed activities; 2) partnering with Butte County Departments of Planning, and Water and Resource Conservation to offer a public education event on Groundwater Recharge; 3) partnering with the Department of Water Resources and Loafer Creek LLC to offer a groundwater recharge tour by land and a watershed tour by helicopter; 4) partnering with the Natural Resource Conservation Service to investigate the sources of sedimentation and assess the potential for flooding along the Cherokee Canal; and 5) partnering with the Paradise Horsemen's Association and the Fire Safe Council to provide workshops to support watershed health through healthy horse management practices and reducing forest fire danger through landowner practices.

Some of the project conclusions and recommendations include: 1) observed water quality in the Cherokee water appears to be generally good; 2) future monitoring should focus on mercury, sediment, and turbidity; 3) bioassessment monitoring should be repeated with an emphasis on Cottonwood Creek, Gold Run Creek, and the Cherokee Canal; 4) the overall water quality survey should be repeated on a periodic basis of three to five years; and 5) continue to track significant changes in the watershed that may include; significant expansion of surface mining, increased urbanization, major flood events that trigger significant channel alterations, flow alterations related to surface water or groundwater management, or extended drought conditions.

Bluewaterhole Road Sediment Reduction Project

Mendocino County Resource Conservation District

Award Amount: \$72,760

Watershed: Garcia River Watershed (Mendocino County)

Water Board Region: North Coast Regional Water Quality Control Board

Project Goals

The primary purpose of this project was to minimize chronic winter erosion that subjects Bluewaterhole Creek to persistent turbidity, and to minimize the potential for episodic fill failures caused by undersized culverts during 50-year or 100-year floods. A secondary purpose was to educate students on the topic of ecologically effective road reconstruction and storm proofing measures during construction.

Project Outcomes

This project storm-proofed 36 stream crossings on 4 miles of native surfaced road on the eastside of Bluewaterhole Creek. There was a total of 360 cubic yards of rock that was utilized for this project. Pre-treatment conditions included numerous class III steams, which were diverted by the main road and/or skid trails, and undersized culvert class III crossings. Workshops were also held during two days of construction (July 1 and 2, 2003) and on a follow up day in spring (March 4, 2004). Participants observed the successes and failures of the project in flowing water conditions. During construction, workshop participants observed sites in their pre-treatment and during treatment conditions.

Photo monitoring of the project documented pre and post-treatment conditions of the project. Some post-treatment locations could not be found because the photographer could not locate station markers of where the improvements were made.

This project most closely met Goal #6 of the Garcia Watershed Enhancement Plan, published by the Mendocino County Resource Conservation District. This goal was to "Identify and target for treatment, areas of accelerated erosion which impact water quality and fisheries. These areas include roads and other land-use associated problems."

San Diego Creek Sediment Basin and Weir Construction Project

County of Orange

Award Amount: \$816,250

Watershed: San Diego Creek (Orange County)

Water Board Region: Santa Ana Regional Water Quality Control Board

Project Goals

The goal of this Project was to remove sediment from San Diego Creek In-Channel Sediment Basin #2 so the sediment would not be transported to Upper Newport Bay and to increase the sediment trapping efficiency of this facility. The goal of raising the Jamboree Weir across San Diego Creek was to prevent In-Channel Sediment Basin #1 from being a source of sediment to upper Newport Bay.

Project Outcomes

The excavation of San Diego Creek In-Channel Sediment Basin #2 was completed on March 30, 2005. 16,000 cubic yards of material was removed from the creek and transported to the upper San Diego Creek Watershed. The disposal site was Planning Area Number 6 just north of the former El Toro Marine Base. The weir portion of the contract was not constructed due to the unfavorable response towards the project by the California Coastal Commission and the U.S. Army Corps of Engineers. Grant objectives were met since the elevation of San Diego Creek Sediment Basin #2 was lowered from elevation 5.0-ft msl to elevation 2.5-ft msl. There was a total project savings of \$184,000 within the grant agreement. The project savings were shared 78 percent State and 21 percent County based on the corresponding contributions to the grant.

It appears that there may be just as many environmental impacts in dredging the San Diego Creek In-Channel Basins as there is in dredging the Upper Bay. The ultimate solution is to prevent erosion where it occurs rather than dredge Upper Newport Bay or Lower San Diego Creek. Based on sediment TMDL workshop in early 2005, the Santa Ana Regional Water Board discussed armoring existing earthen channels since it appears that the majority of the sediment is coming from horizontal and vertical expansion of the earthen flood control channels in the mid and upper watershed. The erosion has been most prevalent since the 1960s when the area began to be developed. These channels will have to be armored with native vegetation some rock riprap. This project should allow rock grade stabilizers and some type of structural armoring to accept native plants.

The first of the three photos on the next page shows the pre-project conditions of the Creek and the next two photos show sediment removal in process.

San Diego Creek Sediment Basin and Weir Construction Project



**Upper San Luis Rey Watershed Arundo Control
and Riparian Habitat Restoration**
Mission Resource Conservation District

Award Amount: \$911,000

Watershed: Santa Margarita and San Luis Rey Watershed (San Diego County)

Water Board Region: San Diego Regional Water Quality Control Board

Project Goals

The purpose of the Upper San Luis Rey Watershed Arundo Control and Riparian Habitat Restoration project was to complete a key component of Arundo removal within a watershed-wide riparian habitat restoration program. A minimum of 40 acres of Arundo along the San Luis Rey River and four tributaries: Keys Creek, Rice Canyon, Stewart Canyon and Double Canyon were treated under this project. The overall objectives were to reduce the likelihood of flooding and fire, reduce erosion, improve habitat quality, restore natural water flows and native riparian habitat, and involve and educate watershed stakeholders.

Project Outcomes

This project was highly successful at treating 78.2 acres of Arundo on the San Luis Rey Watershed in northern San Diego County. Nearly twice the specified minimum 40 acres of Arundo was treated and the efficacy of Arundo control and native planting survival was high. The project treated the entire upper watershed, allowing future treatment projects to continue on the main stem of the San Luis Rey River. The program will have long-term benefits, as Arundo propagules will not spread into cleared sites or to any downstream areas.

Specific functions that have been restored include: flood and flow regimes that control sedimentation, habitat structure and flood resources, water quality (temperature regimes, nonpoint source pollution contamination reduction from illegal housing and nutrients), and water quantity. All these improvements enhance the watershed for wildlife and its inhabitants.

There was also a water savings (reduced transpiration) benefit of this project which, when the Arundo was removed, saved approximately 361.8 acre/ft per year.

Upper San Luis Rey Watershed Arundo Control and Riparian Habitat Restoration



Sept 2003:
Prior to *Arundo* control



Feb 2004:
Mowing dead *Arundo*



June 2004:
After mowing and native
planting

Restoring Deer Creek: Building Partnerships to Overcome the Legacy of the Gold Rush Era

Friends of Deer Creek

Award Amount: \$360,000

Watershed: Deer Creek (Nevada County)

Water Board Region: Central Valley Regional Water Quality Control Board

Project Goals

The goals of this project were to create a model of how a rural community can develop a partnership that spans City and County government, federal agencies, local nonprofit organizations, land owners, and educational and youth groups to turn a degraded creek that flows through the center of a small town into a resource for aquatic organisms, for education, and for the direct benefit of the citizens of Nevada City and the surrounding area.

Project Outcomes

Under this project, Friends of Deer Creek developed a benthic macroinvertebrate sampling and training program (including a training manual) that is modeled in other communities. The bacteria sampling and analysis program is not commonly found in watershed groups and is used by Nevada County to help diagnose contamination in Squirrel Creek, a major Deer Creek tributary. The restoration in Pioneer Park was designed in a public park to act as a model for good restoration practices, community partnerships in a project, and low costs. The macroinvertebrate data is suggesting that the health of the creek is improving from these practices and the community seems to be more educated about restoration, as revealed from the audience of a recent local land stewardship conference.

It was shown that by collaborations with the County and City, problems can be addressed without litigation, and, instead, can be solved using scientific data, compromise and practical solutions. A good example of this is working with Nevada City Public Works Department to install storm drain traps to reduce sediment flows to Deer Creek. The Prop 13 funding was used to buy the traps and the City used its money for labor and maintenance costs.

Collected baseline data has also allowed for submission of two applications for a 303(d) listing for impaired watersheds, one of which was accepted in 2001 and one of which is pending. These listings will allow future studies and solutions to some of Deer Creek's most immediate and pressing problems. In addition, the baseline data will form a picture of the watershed changes occurring in the future, showing how development, logging, and farming influences along with climate change can affect the water quality and riparian habitat health.

All of Friends of Deer Creek's work and scientific studies have been shared with the community in a manner that involved their labor and input and was helpful in their education as citizens and their identification as stakeholders in the watershed.

Installation of Storm drains



BMPs written to help homeowners prevent erosion like this in new development



Water Quality Improvement in Cow Creek Watershed

Western Shasta Resource Conservation District

Award Amount: \$66,466

Watershed: Cow Creek (Shasta County)

Water Board Region: Central Valley Regional Water Quality Control Board

Project Goals

The project goal was to establish water quality baseline conditions in the watershed while fostering watershed-based management efforts of the project. This was done by doing the following steps: identifying the sources of fecal coliform in the Cow Creek Watershed and developing options to remedy the problem; monitoring water temperature in various locations to determine the capacity within the watershed to lower elevated temperatures to improve anadromus-fish habitat; supporting an ongoing monitoring program to implement adaptive management. In addition, the project facilitated and improved collaboration among government agencies and the Cow Creek Watershed Management Group to conduct a monitoring program based on sound science. The monitoring program included a wide range of participants in the decision-making process for watershed health enhancement and disseminated information throughout the watershed (including local, regional, and state groups). The resulting implementation plan included a priority list of projects with estimated costs and a list of potential funding sources.

Project Outcomes

Precipitation and Stream Flow

Precipitation and stream flow conditions have a large effect on water temperature and microbial activity in lotic waters. Over the period of this study Chinook salmon were first observed in lower tributaries the second week of October in 2004 and 2005, generally following the first significant precipitation event of the season. These spawning adults were most likely fall-run Chinook. Water temperature noticeably lowers after precipitation events. Some streams show peak microbial activity as flows decrease leaving isolated pools.

Temperature

Stream water temperature fluctuated daily and throughout the season at all 22 sites measured. Daily temperatures ranged as much as 10°C in the downstream reaches, and a few upstream tributaries. Seasonal temperatures differed by as much as 30°C, and a little as 10°C in the upper elevation tributaries. Although only higher elevation sites maintained coldwater habitat year round, lower elevation sites had suitable temperature during the fall spawning period in mid-October. Adult Chinook

salmon did not migrate into the Main Stem of Cow Creek until the first heavy precipitation events in October. In general, cold-water habitat persisted in the Main Stem until about the first week of June.

E. coli

Concentrations of *E. coli* varied greatly across the Cow Creek Basin and throughout the study period. Over half of the samples collected at various sites exceeded the single sample safe public contact threshold proposed by the State Water Board in the 2002 Amendment to the Basin Plan for the Sacramento River and its Watersheds. Other sites regularly exceeded this threshold or had one or more samples that exceeded the measurement capacity of the technique used. High *E. coli* concentrations at all sites were generally associated with storm runoff events following periods of no rain. However, sites that regularly exceeded the safe public contact threshold listed above also did so during the May - September dry seasons.

Public Outreach

For the project, the Western Shasta RCD worked with landowners and stakeholders in the Cow Creek Watershed Management Group and the greater community at large. The education and outreach incorporated into the project ensured continued involvement of the community. Outreach included quarterly newsletter articles, public service announcements, periodic news articles to the local media, and community meetings. Representatives of the community were also invited to participate on the Technical Advisory Committee. Landowners were contacted and Temporary Entry Permits signed to give those implementing the project permission to place sensors and conduct water sampling. The final results of the monitoring project were then presented to the Cow Creek Watershed Management Group at a public community meeting.

Sediment Phosphorous Control Program in Big Bear Lake

Big Bear Municipal Water District

Award Amount: \$500,000

Watershed: Big Bear (San Bernardino County)

Water Board Region: Santa Ana Regional Water Quality Control Board

Project Goals

The primary goal of this project was to conduct a full-scale alum application in Big Bear Lake to reduce the internal loading of nutrient phosphorus and to collect data to demonstrate the success of the alum application.

Project Outcomes

The 2004 alum application was applied over a portion of the critical lake bottom and the dose was estimated to last for 5 years. Lasting control of the sediment phosphorus pool would require a single alum dose about 10 times greater than that applied in 2004 to inactivate the entire sediment phosphorus pool. Thus, continued control over the release of phosphorus from lake sediment will require re-application of alum doses similar to that applied in 2004 over time.

The results of this study clearly demonstrated that the 2004 full-scale alum application was successful in controlling nutrient phosphorus releases from the lake sediments and had a profound affect on the internal nutrient loading rates. The alum application was also successful due to the following:

- The alum application produced measurable improvements in the overall water quality of Big Bear Lake. Specifically, the 2004 full-scale alum application reduced water column nutrient concentrations and chlorophyll levels, while simultaneously improving water clarity.
- The alum application did not produce acidic pH levels, which in turn protected aquatic life within the lake from aluminum toxicity. Further, the lake's pH level was optimum for the formation of alum floc and a reactive alum barrier.

In conclusion, the results of this study indicate that alum application is a viable lake nutrient remediation option for Big Bear Lake.

Hamilton Bowl Trash Reduction Project

City of Signal Hill

Award Amount: \$783,000

Watershed: Los Angeles River (Los Angeles County)

Water Board Region: Los Angeles Regional Water Quality Control Board

Project Goals

The goal of this project was the installation and evaluation of four styles of trash capture systems placed on or in-line on ten outfalls or storm drain lines in the Hamilton Bowl stormwater runoff detention basin located in the City of Long Beach. It is a 15-acre detention basin with surrounding earthen embankments approximately 10 feet in height. The Bowl has an approximate storage capacity of 160 acre-feet.

Project Outcomes

Under this project, BMPs consisting of various styles and sizes of commercially available trash capture systems were installed and their effectiveness in reducing the trash loading of the Los Angeles River was evaluated. Four styles of trash capture systems were selected and installed: (1) trash nets, (2) centrifugal vortex system, (3) basket insert for catch basins and (4) slotted cylindrical pipe.

Based on this study, 3,647 lbs of trash and debris was captured at Hamilton Bowl by the trash capture systems during a one-day rainstorm event with 0.19 inches of precipitation. Out of the 3,647 lbs of debris captured, 344.5 lbs (9.5%) was concluded to be anthropogenic litter. Overall, plastic items were observed to be the largest component ranging from 4 -30 percent (by weight varying for each outfall unit) of the total amount of litter captured. The category containing the least amount of litter was glass materials. The data shows that percentages of litter composition in all seven outfall units, in all five categories, remained relatively constant.

All trash capture systems performed as reasonably expected. All systems captured anthropogenic trash and debris and there were no system failures or citizen complaints during the evaluation period.

The following four photos and one diagram show the conditions in the detention basin and the type of treatment systems installed.

Hamilton Bowl Trash Reduction Project



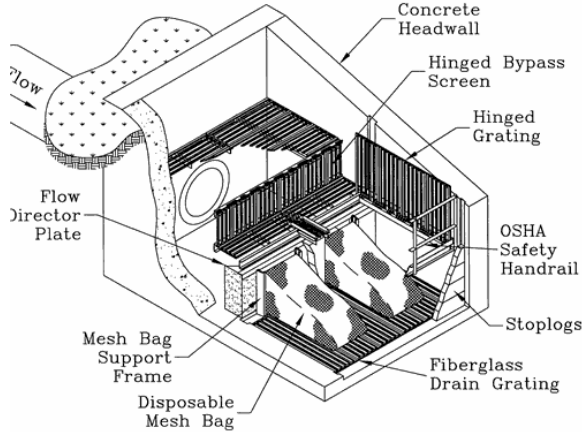
Trash & litter on ground



Same general area after trash capture systems installed on four outfalls

Hamilton Bowl Trash Reduction Project

End Of Pipe Netting TrashTrap®



Continuous Deflective Separation Unit (CDS)



Filter installed in Catch Basin

Torres Martinez/Salton Sea Nutrient Project

Torres Martinez Desert Cahuilla Indian Tribe

Award Amount: \$150,000

Watershed: Salton Sea (Imperial and Riverside County)

Water Board Region: Colorado River Basin Regional Water Quality Control Board

Project Goals

The goal of the project was to study and document nutrient and other pollutant loading in the Whitewater River inflows going to the Salton Sea and to provide guidance for immediate Best Management Practices implementation. The objectives of this study included the following: (1) summarize generated stream water quality data for the Whitewater River; (2) evaluate Tribal standards exceedances for nutrients and other pollutants; (3) present possible sources of pollutants that contributed to the standard exceedances; and (4) gather data associated with BMP's as monitoring occurs.

Project Outcomes

This project produced a Nutrient Loading Assessment Report which presented a summary of the sampling data, an evaluation of Tribal water quality standards, and recommendations based on the results of the water samples. This report took the nutrient data collected from the water quality monitoring program and drew solid conclusions concerning pollution loading in the Whitewater River that eventually leads to the Salton Sea. Another report on Nutrient Management BMPs was completed that identified and recommended BMPs for eliminating or reducing the nutrient problems identified in the Nutrient Loading Assessment Report. After evaluation of many BMPs, wetlands were identified as the target BMP for this project. Lastly, the project data and interpretations were made available to the public and other interested public/private agencies through a website that was developed and available at www.tribalwater.net.

Fats, Oil and Grease Control Study (Phase II) to Reduce Sanitary Sewer Overflows

Orange County Sanitation District

Award Amount: \$250,000

Watershed: Santa Ana River Basin (Orange County)

Water Board Region: Santa Ana Regional Water Quality Control Board

Project Goals

Phase I of the Study, completed in June 2003, identified 12 potential building blocks for an effective fat, oil and grease (FOG) Control Program. However, the Study also concluded that there are relatively new promising FOG control technologies in use at food service establishments (FSEs) and in sewer lines that may provide substantial FOG control benefits, but their level of objective scientific evaluation is limited. Therefore, the Study recommended that these technologies should be evaluated before they are included as building blocks for local FOG Control Programs. This Phase II Study was designed to evaluate these technologies.

In order to provide practical findings and recommendations for the stakeholders of the Study, the primary goals of the Study for the various technologies were as follows:

- Additives, Sewer Line applied – to identify if and under what conditions this technology may be acceptable as an alternative to, or enhancement of, sewer line cleaning.
- Additives, food service establishments (FSE) applied – to identify if and under what conditions this technology may be utilized as an alternative to the requirement to install a conventional grease interceptor for FSEs that cannot install a conventional grease interceptor.
- Non-conventional Grease Traps – to identify if and under what conditions this technology may be suitable as an alternative to a conventional grease interceptor.
- Interceptor Monitoring Devices – to identify if and under what conditions this technology may be utilized as an alternative to, or in addition to, conducting inspections of conventional grease interceptors.

Project Outcomes

Additive, Sewer Line applied

Based on the results of these evaluations, the Sewer Line-applied additives do not appear to be comparable to effective line cleaning based on the TV images of cleaned sewer pipe compared to the TV images after 4 to 6 months of utilization of the additive.

Additives, FSE applied

The encouraging results at 4 of the 5 FSEs may provide some evidence that FSE-applied additives could be considered as an alternative to the requirement to install a grease interceptor at FSEs that cannot install a grease interceptor. Further study of FSE-applied additives should be conducted that evaluates the effectiveness of the additive after improved kitchen BMPs have been implemented. The report provides suggestions on how a future study could be designed.

Non-conventional Grease Traps

Based on the evaluations in this Study, grease removal devices (GRDs) may work effectively on the fixtures they are properly connected to as long as they are properly sized, installed, and maintained. However, inspectors approving installations must assure that all GRDs are sized and installed correctly and that the isolation-type GRDs are connected to all potential significant grease waste drains. Additionally, frequent maintenance inspections by a regulatory agency will be required in order to ensure that the GRDs are properly maintained.

Interceptor Monitoring Devices (IMD)

Based on the data evaluated in the Study, IMDs should be seriously considered for use in Orange County FOG Control Programs provided they are inspected for proper installation, calibration, and accuracy over time. FSEs should be encouraged to utilize IMDs, and FOG Control Program Managers should take advantage of the potential monitoring and enforcement benefits of this technology. Based on the results of this evaluation, there will be some measurement accuracy issues at some installations. However, as long as agencies do not view IMDs as a technology that will completely remove the need for agencies to inspect conventional grease interceptor altogether, the use of IMDs should reduce the frequency of agency interceptor inspections and, therefore, reduce agency costs.

The Yuba River Citizen Monitoring Program Phase II

South Yuba River Citizens League

Award Amount: \$214,201

Watershed: Yuba River (Nevada County)

Water Board Region: Central Valley Regional Water Quality Control Board

Project Goals

The goals of this project were to:

- Design and execute scientifically credible studies, which assess the condition of the Yuba River ecosystem.
- Empower citizens to be responsible stewards and decision makers.
- Identify valued resources and watershed characteristics for setting management goals.
- Identify physical watershed characteristics influencing pollutant inputs, transport and fate.
- Identify the status and trends of biological resources in and around the Yuba aquatic environment.
- Assess the waterbody by screening for water quality problems.
- Establish trends in water quality for waters that would otherwise be unmonitored.
- Develop a Citizen Monitoring Handbook.
- Produce a Citizen Monitoring Conference.
- Add new monitoring parameters as necessary including lead, chromium, ammonia, nitrogen, and phosphates.

Project Outcomes

After four years, the effects of the project are still being revealed. To date this project has resulted in the following:

- A large volume of scientifically verifiable water quality data collected using accepted quality control measures, providing Upper Yuba River stakeholders with necessary information to make informed management decisions.
- A model volunteer water quality monitoring program that is being exported to other watersheds.
- A strong community partnership that fosters awareness of watershed issues and local watershed stewardship.
- A well-developed series of educational workbooks about Citizen Monitoring.
- A well-attended Monitoring Conference.

San Diego River Park – Lakeside Conservancy Restoration and Recharge Project

Lakeside River Park Conservancy

Award Amount: \$1,290,725

Watershed: San Diego (San Diego County)

Water Board Region: San Diego Regional Water Quality Control Board

Project Goals

The three major goals of this restoration project which is located along a 100 acre reach of the San Diego River were to: improve water quality, restore native habitat, and increase flood protection.

Project Outcomes

Construction on the Constructed Wetland (CW) and Expanded Bioswale systems was completed in January 2007. However, the systems will require time for the seeded vegetation to sprout and grow and for plantings to mature and expand into dense communities. In addition, time is needed for the disturbed soils to once again settle and for necessary microbial communities to flourish and perform processes like nitrification and de-nitrification. Thousands of plants were installed to slow flow rates to enable particulate pollutants to settle or become lodged in the working interstices of the system, to provide a matrix for microbial life, to draw up nutrients from the water column and from the substrate, and to serve as filters.

The CW system already is meaningfully reducing nitrate, copper and TSS concentrations. While some of this early CW success may be due to its zeolite layers, the Expanded Bioswale also has provided positive evidence that phosphorus is being removed. The 44% reduction in E. Coli concentrations in the Expanded Bioswale during the February 13, 2007 Rain Event is notable. The grant prescribed the requirement for the reduction of any pollutant. Reductions of more than one pollutant have been shown in each system, yet these are the very early stages of system performance.

Although the new filtration systems have immature vegetation, they already have demonstrated pollutant reductions in the urban stream course before it enters the river. Habitat acreage has grown. Acres of invasive Arundo Donax and Tamarisk, along with other non-natives have been eradicated. Flood control has increased. Excavation and removal of 90,000 cubic yards from the riverway has eliminated the constriction near Channel Road and dropped the 100-year flood level by four feet.

El Rio Sewer System Project

County of Ventura

Award Amount: \$2,500,000

Watershed: El Rio Forebay (Ventura County)

Water Board Region: Los Angeles Regional Water Quality Control Board

Project Goals

This Project's goal was to construct a conventional sewer system for the Strickland Tract area of the El Rio Community, and a connection line to the Montgomery Lift Station near the County of Ventura Juvenile Justice Center (JJC) to transport the effluent to the City of Oxnard Water Treatment Plant. The effluent from the Strickland Tract is transported to the City of Oxnard sewer system for treatment and disposal at the City of Oxnard Wastewater Treatment Plant. The project provided for 130 lateral connections (125 residential and five commercial/institutional), and facilitated the abandonment of 145 septic tanks.

Project Outcomes

On December 29, 2005, the property owners were given a 90-day connection notice to connect to the newly constructed sewer collection system. The County of Ventura Public Works Water Resources Division estimates that each tank removed will result in an annual reduction of approximately 164 lbs. in nitrates discharged into the Oxnard Forebay (Forebay). These estimates are used to evaluate the success of the project. Sampling the water would be a much less dependable means of testing the results. The water table in the Forebay varies and shifts so often the samples would not be trustworthy.

The project was completed on December 14, 2005, and accepted sewage from individual property owners. Approximately 11,150 linear feet of sewer pipe was installed, which facilitated the abandonment of 127 residential septic tanks and five septic tanks at commercial properties.

When all of the Strickland Tract homeowners and businesses have connected to the new sewer system, there will be an annual reduction of approximately 23,780 lbs of nitrates (145 tanks x 164 lbs.) discharged into the Forebay groundwater, which is the source of water supplied to the El Rio Community. Homeowners must comply with the Los Angeles Regional Water Quality Control Board adopted Resolution No. 99-13 which prohibits discharges from septic systems within the Forebay, effective January 1, 2008. Property owners within the Forebay who do not comply with the septic tank prohibition may be fined up to \$10,000 per day, by the State.

North Yuba River Watershed Improvement Project: Abandoned Mine Reclamation and Restoration

Sierra County Board of Supervisors

Award Amount: \$217,000

Watershed: North Yuba (Sierra County)

Water Board Region: Central Valley Regional Water Quality Control Board

Project Goals

The goals of the project were to accomplish watershed restoration at abandoned mine sites. The objectives were to reduce sediment, provide geomorphic stabilization in disturbed areas, improve water quality to benefit habitat for fish and wildlife, and additionally, improve the human experience, including recreation, in the North Yuba watershed and downstream.

Project Outcomes

This reclamation project was multi-faceted and involved four project locations. Accomplishments for each are as follows:

Howard Meadows

Gully restoration: The headcut was stabilized and 200 feet of stream channel was restored.

Road decommissioning: 2.1 miles of road obliteration was completed.

Meadow restoration: 8 acres of meadow were restored, which included the backfilling of diversion ditches that were dewatering the meadow.

Brandy City Diggings

Road decommissioning: 3 spur roads, totaling 1.95 miles, were decommissioned and obliterated.

Gully restoration: 625 feet of gully were restored which included the removal of 3 log check dams and the repair and stabilization of a large headcut.

Brush Creek Mine

Road decommissioning: Decommissioned and obliterated 2.3 miles of mine road in the inner gorge of Woodruff Creek.

Klondike Mine

Road decommissioning: Obliteration of 0.2 miles of abandoned mine road.

Mine restoration: 7.3 acres of mine restoration that included the removal of settling ponds, construction of slope stabilization structures, installation of surface run-on/runoff drainage control structures, installation of subsurface drain, scarification of the mine pad, and the placement of mycorrhizal inoculated seed matting.

Next Steps

The Tahoe National Forest will utilize appropriated funding to continue to monitor the project effectiveness. If necessary, appropriate operational and maintenance work will be completed with the same funding.

Photos

The photos on the following two pages document some of the improvements made as a result of this project.

North Yuba River Watershed Improvement Project



Headcut at Lower Brandy City Diggings



Headcut after stabilization work.



Road obliteration "before" photo



Road obliteration After photo



Culvert Removal "Before"



Culvert Removal "after"

North Yuba River Watershed Improvement Project

Klondike– The project conducted remedial grading operations to recontour waste dump fills and and backfill the abandoned settling pond located on the work pad. Existing soil/rock from the abandoned pond berm was utilized.



View of mine pad after demolition of the building

Benefits – Restoration of wildlife habitat and restoring the site to natural resource production. Stabilizing the hillslope to enhance fish habit impacted by eroding mine waste dump soil.

Work Performed – The project conducted some remedial grading to re-channel non-desirable drainage at the bottom of the dump by constructing log erosion barriers on the steep eroding fill slopes and placing native and waste mine rock on the slope to help stabilize it. At the Telegraph Mine pad, a culvert along the abandoned mine road had the potential to plug and cause future problems. This culvert was removed with an excavator and a functioning drainage channel was reconstructed across the mine pad. The project used mechanized equipment to strategically place boulders, logs, and other native materials to improve micro-climates and water holding capacities.



View of Klondike Settling pond before reclamation of the work pad