

**State Water Resource Control Board
Agreement #03-100-555-0
Term November 1, 2003 thru December 31, 2006
319(h) Grant - Final Report**

Citizen-based Implementation and Effectiveness Monitoring of Best Management Practices (BMPs) and Stream Restoration in the Tributary Watersheds of the Lower Sacramento River

Executive Summary:

This grant continues previous monitoring activities and the collection of background data for streams. This project is a community-based collaboration within and between subregions of the lower tributaries to the Sacramento River. Three recognized subwatersheds will boost current site identification, restoration and protection implementation, evaluation and public outreach efforts. Building upon earlier successes, this project will result in reduced erosion and sedimentation, enhanced riparian corridor vegetation and habitat, protected reservoir capacity and enhanced water quality.

Funding supported a growing corps of citizen scientist/engineers in their application of current assessment knowledge to specific technology-based implementation actions using a variety of tools; including signage; stream bank re-vegetation; erosion control measures; and invasive species mapping, eradication, and monitoring.

Both Upper Putah Creek and Upper Cache Creek stewardship efforts have boosted their citizen-based watershed monitoring efforts and raised the level of community awareness in terms of watershed values to a higher level. Building upon earlier successes in terms of nurturing citizen volunteer teams, this project nurtured previous volunteer efforts into mature, committed, and knowledgeable watershed assessment teams. The information collected by these citizen-based stream assessment teams was gathered using recognized *Rapid Bioassessment Protocols*.

The teaching of these *Rapid Bioassessment Protocols*, also supported by this grant, resulted in the training of citizen-based assessment teams, the advancement of both their individual and team knowledge, and therefore their levels of expertise ensuring the quality of assessment information collected. Citizens learned not only protocols and assessment techniques through the use of both classroom and "in the field" training, but advanced their knowledge to another level in terms of gaining expertise in performing lab work needed to properly assess sampling information gathered. This report accompanies all the information gathered by these teams in an electronic database with backup documentation in hard copy. You will find the information to be comprehensive even in the face of unfavorable conditions that hampered data collection efforts including a lengthy contracting process followed by both unfavorable weather conditions and prevailing wage issues that hampered the use of volunteer efforts.

Another component of the grant reduced Off Road Vehicle (ORV) access, reducing erosion and sedimentation in the Dry Creek Watershed. The collaborative effort to enhance riparian corridor vegetation and habitat in the Secret Ravine Preserve area damaged by ORV use was implemented by working collaboratively with the local municipal jurisdictions, adjacent property owners, and the public through education efforts to discourage and restrict ORV use in the Preserve and conduct restoration activities to enhance riparian conditions and water quality.

Overall, a growing corps of citizen scientists/engineers applied current assessment knowledge to specific, technology-based implementation actions using a variety of tools, including signage, streambank revegetation, erosion control measures, invasive species mapping and eradication, and monitoring to protect, enhance, and preserve watershed values in their respective project areas.

Statement of Purpose:

California's increasing population continues to place pressure on the Sacramento River Watershed resulting in water resource degradation from several nonpoint sources: urbanization of formerly rural landscapes, illegal land use activities from Off Road Vehicles, sedimentation from forest roads network, stormwater and urban runoff on lands converted from agriculture, and channel modification due to increasingly urban land uses among others. Upper Cache Creek and Dry Creek are listed as Category I Priority Watersheds; Upper Putah Creek is listed as Category I Impaired Watershed.

The three watersheds were at different stages of addressing these fundamental problems, some work had been done, but much more was needed. Two watersheds needed to implement effectiveness monitoring of existing restoration projects and land/resource management practices, utilize existing and proposed monitoring data to prioritize proposed restoration projects identified in current watershed plans, and develop demonstration sites for BMPs and stream restoration measures (Upper Putah Creek and Upper Cache Creek). One watershed needed to implement nonpoint source management measures already prioritized in existing watershed plans, (Dry Creek). Public education and outreach was needed in all three watersheds to inform stakeholders of management and monitoring measures needed to assess the success of existing and planned projects. Citizen monitors were an integral part of all project implementation and effectiveness monitoring efforts. The Sustainable Land Stewardship Institute provided education training and outreach throughout the Sacramento River Watershed for training *Rapid Bioassessment Protocols*, fundamental to the citizen-based monitoring efforts.

Project Tasks:

Task 1. Administration:

Project Task List:

Task 1.1:

The Placer County Resource Conservation District (RCD) provided all the technical and administrative services needed to ensure the completion of the Agreement. They reviewed all work performed, coordinated budgeting and scheduling assuring the Agreement was completed within budget, on schedule, and in accordance with approved procedures, applicable laws, and regulations.

Task 1.2:

The RCD ensured Agreement requirements were met through quarterly progress reports and communication with the SWRCB Project Representative. Progress reports described activities undertaken and accomplishments by task, milestones achieved, and problems encountered during the quarter being reported.

Task 1.3:

The RCD complied with all Federal Disclosure Requirements appropriate disclosures.

Task 1.4:

The RCD complied with media event reporting parameters.

Task 1.5:

The RCD completed the one page summary form as required.

Task 1.6:

The RCD fulfilled the Federal Requirement for Minority and Women Owned Business Participation.

Task 1.7:

The RCD awarded subcontracts to the appropriate organizations to perform the tasks as outlined in the Agreement and documented their activities and expenditures in quarterly progress reports.

Task 1.8:

The RCD has completed the required Natural Resources Projects Inventory Survey Form.

Reported Match:

A total match of \$4,375.00 was reported and consisted of time spent caucusing with county and local jurisdictions regarding watershed based vegetation management to reduce the risk of wildfire and therefore potential impacts to water quality.

Task 2. CEQA Documents and Permits:

Project Task List:

Task 2.1:

CEQA regulations provide exemptions for small habitat restoration projects. (Section 15333), it was determined by local jurisdiction that the exemption did apply and the projects implemented under this Agreement did not need to be processed through CEQA.

Task 2.2:

No permits were required for the projects implemented under this Agreement.

Task 3: Quality Assurance Project Plan (QAPP):

Project Task List:

Task 3.1:

A QAPP was submitted for the Dry Creek Watershed monitoring program, was approved, and signed. A QAPP was also submitted for the Upper Cache Creek and Upper Putah Creek Watersheds, was approved, and signed.

Task 4: Upper Putah Creek Stewardship (Stewardship):

Purpose and Scope of Project:

Upper Putah Creek is the only source of water for citizens of the watershed and supplies a major portion of the water in Lake Berryessa. The purpose of this project was to improve stewardship of the Upper Putah Creek watershed by demonstrating stream techniques on St. Helena Creek in downtown Middletown, identifying and eradicating invasive riparian plants in collaboration with the Lake County Weed Management Area program, training citizen monitors and nurturing Rapid Bioassessment Teams, and the establishment of a watershed education and outreach programs to schools and citizens.

The Stewardship pursued an aggressive education and outreach program, both in the schools and with the public. This was done through use of *Trout in the Classroom* and *Adopt-A-Watershed* programs; annual events: *Field Days in the Creek* and *Middletown Days*; citizen monitor training workshops; open meetings; developing, building and installing an informational kiosk in Middletown; and the establishment of a Watershed Center making educational information available to the public.

Bioassessment monitoring was conducted at numerous locations in the watershed to provide a data base on which to measure the effectiveness of restoration work and the overall health of the watershed.

The Stewardship has developed programs addressing the health of the entire region from a watershed perspective. The subtasks can be considered as parts of an overall effort to bring a higher state of the well-being to the watershed and its inhabitants.

The restoration project has been a high priority with the Stewardship for years. Work on this project ties together much of the citizen training and outreach efforts, the recruitment of citizen monitors, working with students in *Field Days in the Creek*, *Trout in the Classroom*, *Adopt-A-Watershed*, and *Middletown Days* provided a meaningful experience for citizens and young people.

Techniques to do these tasks were straightforward; citizen monitoring required workshops and practical field experience while student programs involved workshops, training at retreats and camp and practical classroom experience. Restoration work included planning and actual work.

Challenges:

This contract has been a series of serious challenges. The lengthy state contracting process made for a late workplan start date. The QAPP was not in place in time to allow maximum field time for data and sample collection. Unusually heavy rainy periods the last winter followed by quick drying of streams and extreme summer weather conditions that made fire danger a critical factor effectively curtailed any meaningful field work last monitoring season therefore making it impossible to meet Agreement sampling targets and the completion of a *Final Watershed Health Analysis Report* due to incomplete information gathering and restoration re-planting efforts.

The question surrounding the use of volunteer labor on public works projects also had a dampening effect on all volunteer work involved with our projects. The Stewardship Board was very cautious about beginning any work until this issue was resolved. Fortunately it was resolved favorably, but valuable time was lost.

The restoration project was based partially on surveys done by the Weed Management Area team. Their program was based on Arundo eradication. As it turns out Arundo infestation is very minor in this location. While we geared up to eradicate Arundo we were faced with huge infestations of broom and tree of heaven. This factor necessitated adapting the workplan to deal with invasives present and required an amendment to the Agreement to allow for a shift in focus in terms of invasives eradication.

Project Task List:

Task 4.1:

Eradication work was conducted on the required 1/3 of the project area, however re-planting did not take place due to the need to re-treat the area for re-growth from eradication efforts last fall. The Stewardship does have access to plant material and will burn the removed material this winter while continuing eradication efforts and replanting next spring. This restoration project will take a number of years to accomplish. Funding for this work will come from private sources and future grant(s).

A major portion of the work performed on this task was done by a crew employed by the Lake County Weed Management Area. Their work totaled approximately 40 man days and was responsible for removing plants on the CalTrans right of way and third of the plants on the Hampton property. They cut, daubed with an herbicide, and removed or stacked the plant material. The material stacked on the land was burned last fall. The remainder of the removal effort was carried out by the Stewardship. Most of the plants removed last fall re-sprouted making it unadvisable to re-plant until re-growth has been addressed. The area worked on represents the planned for one third of the length of downtown St. Helena Creek.

Deliverables:

Pre and post photo documentation has been delivered along with copies of the newspapers articles and other public outreach materials used to raise interest and recruit participants and draw interested observers.

Task 4.2:

This project was based on the assumption that Arundo was the major problem in our area. No other invasive was considered for removal. The protocol was based on the Arundo del Norte model. After checking with the Lake County Weed Management Area it was found they had already mapped the area and there were only 13 very small sites of Arundo in the section we were working on. The remainder of the area was covered with broom and tree of heaven. For this reason we did not need to do any mapping, however, the Stewardship is developing a protocol that will allow the mapping all invasives. The Weed Management Area team removed the Arundo, the broom, and tree of heaven on the CalTrans right of way. They also removed some broom and tree of heaven on the Hampton property. Stewardship volunteers worked on removing the remainder of the invasives on the Hampton property.

Deliverables:

Lake County Weed Management Area mapped the project area and a map of the project area identifying areas of Arundo has been delivered along with an *Eradication Report* and pre and post photo documentation.

Task 4.3:

Work with the Lake County Weed Management Area team to garner their knowledge regarding the location of invasive weed infestations and assure there is no overlap of program efforts. This collaboration highlighted the fact the Weed Management Area team was concentrating on Arundo only. Efforts continue to work with this county group.

Deliverables:

No deliverables were specifically identified in the Agreement for this sub-task.

Task 4.4:

Citizen training efforts were well executed in collaboration with the Upper Cache Creek watershed efforts of West Lake Resource Conservation District and the Stewardship. These efforts included conducting four training workshops and many field training sessions. More details of the joint training effort are reported under Task 5.1. Two of the sessions took place on the Montesol Ranch, one at Robinson Rancheria, and one at Yuba College. Data training was received at the workshops and one calibration session took place at the Robinson Rancheria workshop.

Deliverables:

Training received by citizens has been outlined and sign-up sheets provided.

Task 4.5:

Years 2004 and 2005 served about 200 students over the two day period. 2006 saw a revision and was estimated to serve about 150 students. The event was limited to one day for all fifth graders in local district schools. The reason; difficulty in scheduling presenters for a two day period and a desire on the part of the schools to have it for one grade level, thereby assuring that all students would eventually have this experience. It also made it easier for the presenters in that they could appropriately frame their talks for one grade level.

The *Adopt-A-Watershed Program* got off to a good start with the support of the local Middletown Unified School District administration; three training sessions were attended and resulted in an active team comprised of two teachers, three high school students and three citizens. We also have a *Steelhead in the Classroom Program* in two of our elementary classrooms. Teachers have been trained and steelhead fry were released to a designated stream this last spring.

The Watershed Center has been operational since June 2004 and is used for the regular daytime meetings of the Stewardship as well as serving as a location for training.

An informational kiosk was assembled and installed. Information is being posted. Photos and landowner agreement for kiosk placement were obtained and delivered.

Deliverables:

A report on student programs and activities has been delivered. An MOU is in existence and a copy has been delivered.

Task 4.6:

It proved to be a huge challenge to conduct bioassessment on twenty (20) streams in the watershed due to the lengthy state contracting process, QAPP approval, and unfavorable weather conditions including heavy rains resulting in high flow conditions immediately followed by early drying of ephemeral streams. In spite of all these challenges, we were able to complete 14 samples, have them analyzed, and prepare an assessment. The Stewardship was able to provide baseline data (pre) on the projects, but as they are not completed as of this date, post data collection will not be accomplished within the Agreement timeframe and precludes producing the Watershed Health Analysis; however, comments on the overall conditions disclosed by field sampling were provided.

Bioassessment data to be entered into the State Water Ambient Monitoring Program (SWAMP) was instead compiled in an Excel-database as SWAMP was not yet ready to accept data. We will forward it when SWAMP is ready to accept data.

An aquatic insect collection was produced and made available for public viewing at the Watershed Center.

Deliverables:

The Bioassessment database, comments on the overall health of the watershed, and photo documentation of the aquatic insect collection were all delivered. A full Watershed Health Analysis was not completed as envisioned due to negative impacts resulting from the delay in the contracting process, QAPP delays, and unforeseeable weather conditions. Overall the intent of the task was implemented as fully as possible under the circumstances.

Reported Match:

Total match came to \$28,113.99 and consisted of volunteer time and included Solano County Water Agency funded bioassessment laboratory fees totaling \$7,350.00.

Task 5. Upper Cache Creek Watershed:

Purpose and Scope of Project:

The goal of the project was to educate and involve stakeholders in the Upper Cache Creek watershed by engaging them in the monitoring and evaluation of existing and potential restoration sites within the watershed. A series of bioassessment workshops, along with ongoing field training, were tools used to educate citizens about the contributions they could make toward improving water quality. Stakeholders learned that they can contribute and play a major role in the health of their watershed. The results of volunteer monitoring efforts are displayed in the photos of the aquatic reference collection, along with a GIS map reflecting the sites where monitoring occurred during the term of the Agreement. These efforts have also been captured in a GIS database. An additional tool, developed to contribute to water quality in the region, was a list of nine Best Management Practices (BMPs). These practices will be part of a coordinated permitting program in the Upper Cache Creek and Upper Putah Creek watersheds, developed in partnership with the Natural Resources Conservation Service that will assist stakeholders with the

implementation of restoration projects using specific BMPs. The local demonstration site in the Scotts Creek sub-watershed of the Upper Cache Creek watershed exhibits several of these BMPs.

Challenges:

The same set of challenges were experienced in the Upper Cache Creek watershed and the Upper Putah Creek watershed and detailed above under Task 4.

Project Task List:

Task 5.1:

An active citizens' water quality monitoring group, the Upper Cache Creek Stream Team, a group of volunteers, was stewarded and nurtured by both the East Lake and West Lake Resource Conservation Districts (RCDs). Development of this group was the result of a number of various techniques used to stimulate volunteer participation. First and foremost was a series of four workshops in partnership with the Upper Putah Creek Stewardship (*Task 4*) and Sustainable Land Stewardship Institute (*Task 7*). The first set of workshops was held at a facility which allowed the volunteers to camp overnight. Sharing meals, stories, and songs over a three-day period allowed the volunteers to form friendships and develop a bond based on shared conservation values. This set of workshops was sponsored by the East Lake and West Lake RCDs in collaboration with the Upper Putah Creek Stewardship, and hosted by the Montesol Ranch. Support was also provided by the Lake County Department of Public Works and Carle` Continuation High School.

The second set of workshops reflected increased participation with local tribal communities. Part 1 of this series was hosted by Robinson Rancheria, who generously provided funds for morning refreshments and lunch. Part 2 was hosted by the Yuba College, Clear Lake Campus, which provided laboratory facilities at no charge. Both workshops were again sponsored by the East Lake and West Lake RCDs along with the Upper Putah Creek Stewardship, with support from the Lake County Community Development Department, Lake County Department of Public Works, and Carle` Continuation High School. Attendees for these workshops have been primarily local, apparently not as common as one might expect. Comments made by Jim Harrington from SLSI made it clear that it is unusual to see such strong local participation in these workshops. We have also hosted students from U.S. EPA Region 9, neighboring RCDs and counties, and tribal members from other areas of California and Nevada. Additional training was provided "in the field" on an ongoing basis throughout monitoring seasons. Physical Habitat training was also provided to local watershed groups who continue to use the forms for sub-watershed assessments. Not only did the workshops and field training instruct volunteers on the techniques of stream monitoring, they resulted in a group of volunteers that have become more concerned and aware of water quality issues in general. Working with bioassessment forms, along with actually being out in the watershed, has opened their eyes and made them more aware of the environment. Increased citizen awareness of erosion control and water quality played a role in the recent development of an Off Highway Vehicle ordinance for Lake County. There are more eyes on the environment of Lake County than ever before.

Challenges:

Actual monitoring efforts were hampered by a shortened time frame of the Agreement, along with two years of unusual weather. The first monitoring season saw creeks going from too high to too dry in a matter of days. Two creeks were missed in the first season because flows literally disappeared within two days. Seasonal creeks become dry during the warmer months, and the first season was a lesson in better planning and coordination. It was a harsh lesson in how quickly irrigation can drain our streams, but a valuable education in water availability and overuse of resources.

The second season was very successful; however, the only perennial creek was not accessible until mid-October as its flow is controlled by a neighboring county's irrigation district and is too high until late fall.

The safety of volunteers is first priority when planning outings and likely one of the reasons the program has been a success. Care has been taken with site preparation for safe access, drinking water is always at hand, and refreshments are provided at the end of the monitoring day.

Plans to establish a stronger High School Stream Team were unfortunately delayed; however, interest is still strong, and we are hopeful that it will continue to develop this coming season.

Special efforts were taken during the local County Fair to highlight the "adventures" of the Stream Team and give them recognition within the community. A brochure was developed to recruit new members for the Upper Cache Creek Stream Team; along with an extremely successful interactive display, a stream table, the perfect tool to educate both adults and children. The stream table demonstrates stream dynamics and the effects of flooding, erosion, sediment control, and pollution. Manned by a group of 24 volunteers over the four-day period of the Lake County Fair, the display was enjoyed by children and adults alike. It provided the perfect opportunity to discuss erosion control and water quality while recruiting more members for the Upper Cache Creek Stream Team. This highly effective display will be a valuable model for water quality education in the future.

Another beneficial education and recruiting tool has been the highly praised *Kids-in-the-Creek* program. In a single morning, this program sees approximately 120 students rotating through nine watershed-education stations which cover a number of topics. One of these stations involves aquatic biology and introduces them to the use of benthic macro-invertebrates as stream health indicators. It's been extremely rewarding to see the same youngsters who attended *Kids-in-the-Creek* in their younger years participating on our High School Stream Team. We start recruiting young! We believe strongly that the education of our youth builds a better future for the health of our watersheds. Members of our local tribes, staff from the U.S. Forest Service, Natural Resources Conservation Service, U.S. EPA, and various county agencies, all participate in this valuable program.

Deliverables:

Task related materials including sign-up sheets, and photographs have been delivered.

Task 5.2:

Another excellent tool to assist citizens in the protection and improvement of water quality in the Upper Cache Creek watershed is a list of nine Best Management Practices (BMPs). These BMPs are composed of practices that are practical and useful for Lake County watersheds, and were primarily developed through a program known as *Partners in Restoration*. Partners and granting agencies participating in this effort are the East Lake and West Lake RCDs, Sustainable Conservation (a non-profit group from San Francisco), and the Natural Resources Conservation Service (NRCS). The RCDs and NRCS are working with Sustainable Conservation to develop a coordinated permitting program in Lake County which will assist stakeholders in the implementation of BMPs. These practices are "soft" practices that are practical for the average land owner to install and will improve habitat, reduce erosion, and reduce the flow of sediments to Clear Lake and tributaries of the Upper Cache Creek watershed. These practices have been reviewed by local tribes, the Army Corps of Engineers, the Department of Fish and Game, the U.S. Department of Fish and Wildlife Service, and the Central Valley Water Quality Control Board. In fact, it is our understanding that the majority of these practices have been adopted for use in the proposed Clear Lake Nutrient TMDLs. Many of these BMPs have been utilized in the Scotts Creek sub-watershed demonstration site.

Deliverables:

The list of BMPs developed has been delivered.

Task 5.3:

The RCDs have been fortunate to have the U.S. Bureau of Land Management (BLM) as a partner in the Scotts Creek sub-watershed demonstration site. Over a period of years, BLM and the RCDs have worked together to introduce this area to a number of students and citizen groups as an example of a “living” demonstration site. Citizen participants and students have worked to gather and plant native seeds and control invasive weeds as contributing partners to this valuable project. Students from local high schools have been actively involved in on-going site maintenance. They have received a first hand look at successful restoration efforts and the often unexpected harshness of Mother Nature. We have had both state and national recognition for this project through a video produced by the NRCS. The demonstration site was used as a backdrop for this film, and was presented as an example of restoration work and partnerships at their best. A portable display of the demonstration site has been created and presented at various public buildings throughout the county. One of our young Stream Team members also gave a power point presentation on the demonstration site to his high school biology class. There is a great deal of local awareness of this project, and there is a real sense of pride in the citizens and students who have been involved with its success. It serves as an example of the benefits of BMPs in the implementation of restoration work.

Deliverables:

Photos and related materials have been delivered.

Task 5.4:

One of our most difficult tasks has been the recovery of funding for taxonomic costs associated with the collection of macro-invertebrates. While waiting for the contracting process to conclude major funding to assist with these expenses was lost for “lack of use.” Fortunately, the local Farm Bureau has very generously covered expenses for most of our creeks. Without their assistance, these expenses would have been very difficult to manage. With their help we were able to have specimens analyzed for nine of the creeks that we have monitored. We are particularly grateful that they have pledged continued funding for this aspect of the program. We had hoped to develop a booklet of photographs of the local macro-invertebrates, but our attempts at capturing images with the donated microscope proved to be an effort in futility. Valiant efforts were made, but the images were simply not clear enough to be useful. However, a rather exciting and positive development has been the interest in taxonomy from members of our Stream Team. Plans are now underway to establish a small citizen-based taxonomy lab at one of our local high schools. We’re extremely pleased to have volunteer interest in this challenging area of bioassessment.

Deliverables:

Photo documentation of the reference collection has been delivered.

Task 5.5:

Photographs are proof of the effectiveness of restoration work as a picture is worth a thousand words. Please note that an incorrect date was indicated on the pre-project photo documentation which was submitted in June 2004. It has been corrected in this report.

Deliverables:

Photo documentation has been delivered.

Task 5.6:

Sampling sites have been mapped using the Geographic Information System (GIS).

Deliverables:

GIS-based map has been delivered.

Task 5.7:

With the SWAMP database not yet ready to receive bioassessment data, a GIS database has been developed to preserve sampling information for SWAMP incorporation at a later date.

Deliverables:

Related photographs, reports, data collection sheets, examples of map views, and monitoring database and taxonomic reports for 2005 and 2006 have been delivered.

Reported Match:

The task match totals \$40,035.60 and consists of volunteer time, donated time from professionals, donated workshop facilities, the donation of materials to construct demonstration tools, workshop refreshments and materials, and included the donation of taxonomy fees in the amount of \$5,400 from the local Farm Bureau.

Task 6. Dry Creek Watershed:

Purpose and Scope of Project:

The project area is one of the highest quality natural areas in the City of Roseville and surrounding areas. The section along Secret Ravine is part of a preserve mandated by the Army Corps of Engineers and maintained by the City of Roseville. The area has a very small maintenance budget that provides for only minimal maintenance activity. This portion of Secret Ravine is of prime importance to the annual salmon and steelhead spawning run since it contains and is adjacent to the most productive spawning areas in the Dry Creek watershed. About 80% of spawning occurs in Secret Ravine.

Because of its natural beauty, varied terrain, and nearness to urban areas the area has long been used by Off Road Vehicles (ORVs) including all terrain vehicles, four wheel drive trucks and SUV's, and dirt bikes. Numerous roads have been created by vehicles and hillsides have been denuded by vehicles practicing hill climbing. In one spot a dirt bike track was built by digging pits and piling dirt in hills. Several structural ramps were built. In large storms the creek overtops its banks and the roads become secondary channels resulting in erosion and sediment deposition in the stream channel. In areas where vehicles drive in the channel stream features have been destroyed resulting in wide shallow, sandy bottoms.

As the project area is a large spread out area, with numerous access points on both private and public land and it was very difficult to limit vehicle traffic and limiting access became the focus of this project since it didn't make sense to re-vegetate impacted sites when vehicles would continue to access the area and destroy the improvements.

Dry Creek Conservancy (DCC) mobilized an active group of residents from the China Garden Road area of Rocklin, members of the Granite Bay Flycasters and others to raise the issue with the Cities of Rocklin and Roseville. DCC initiated meetings with Sutter Hospital and the City of Roseville to address access from hospital property. These discussions took place over a number of years and resulted in the installation of both a gate and boulder barriers. Both cities began to make efforts to place barriers to access where they could. In addition, both cities began to require installation of black iron fences in developments to prevent access to open space areas. In Rocklin fences were installed as lots were developed and before building occurred. The City of Rocklin placed a permanent barrier at the end of China Garden Road that completely prevented access at that point. Residents also kept the problem in front of developers who made efforts to close access points with gates and boulders.

The project took an unexpected turn resulting from meetings with a dirt bike group representative and an Audubon member. They made the point that providing appropriate areas for vehicle activity in an outdoor setting might limit vehicle use of protected areas. The only areas currently available are Mammoth Bar and Hangtown; both have limited access times and are relatively long

distances from the urban area of Roseville and Rocklin. There was enthusiasm from county, city, and state officials for developing a local facility. There is apparently also a large amount of funding from the state and from motorcycle organizations. Initial efforts looked promising but it proved hard to find a location that could be agreed on. The effort slowed with the ill health of one of the leaders. There is however continued development of a private facility in Roseville that may include some public access.

The actual re-vegetation was a relatively simple process that was done mostly by volunteers on three Saturday mornings. More time and effort was spent on developing relationships with interested parties, especially the City of Roseville and Sutter Hospital. By the end of the project there was a surprising amount of cooperation. The city made every effort to facilitate the project through its permitting process and the hospital granted free access to its property for dropping materials and mobilizing volunteers, as well as accessing the open space area from its property. The hospital continues to participate in a dialogue about drainage issues that have an impact on the preserve. A hotel adjacent to one site provided access for the project and is working to prevent unauthorized access.

Another unexpected benefit was the possibility of installing an interpretive sign at the confluence of Miners and Secret Ravines in a very visible area that educates the many visitors to the open space about salmon, their requirements, and ways the community can provide for their sustainability. Funding for these signs became available because the City of Roseville donated signs that had been budgeted for the open space and because a new protocol for benthic macroinvertebrate sampling and riparian habitat assessment resulted in smaller than anticipated monitoring costs. This project accomplished its two main goals the re-vegetation of areas of open space to restore habitat and prevent erosion and education of the community about the value of open space.

Project Task List:

Task 6.1:

In discussions with representatives of city parks and community development DCC worked with the city to get agreement for language, color, and location of signs. After investigation of sign production we accepted the City of Roseville's offer of free signs they had developed for use in open space areas. Volunteers installed six of these signs during Creek Week. In addition the city has installed numerous signs throughout the area.

In addition, we requested and received permission to apply unused grant funds to develop an interpretive sign that shows the life cycle of salmon and an accompanying sign discussing how communities and individuals can help ensure that the salmon population in the Dry Creek system is sustained. The signs were designed by a consultant with material gathered by DCC. The design was approved by the City of Roseville and will be installed in a heavily used trail area. An electronic file is attached as well as a photo of a full sized print out at the installation site.

Deliverables:

Photographs of signs installed in the preserve were delivered.

Task 6.2:

Discussions with ORV users and others trying to keep vehicles out of the open space revealed that recreational users who belong to clubs are not usually the ones who are using public open space illegally. DCC met with the Roseville Garden Club to enlist their help in publicizing the importance of not driving in the open space.

DCC held a meeting with representatives of the American Motorcycle Association (AMA), Audubon, and the City of Roseville. The Audubon and AMA representatives are also on committees of the state off highway vehicle recreation commission. They have been active in meeting with local clubs such as the Sierra Trail Dogs, and recently met with officials from the City of Rocklin. They also met recently with the local Yamaha dealer which resulted in a training

track being installed on dealer premises to teach appropriate use of trail bikes and ORVs in natural areas. It is thought that information coming from recreational users such as the AMA will be more effective than presentations from outside environmental organizations.

This meeting led to the City of Roseville and local Audubon chapter meeting with a local motel to encourage closing off access to a spot where dirt bike riders have created a track. The city has hauled out trash from the site. At this date talks are continuing on the targeted closure.

The DCC meeting with American Motorcycle Association, Audubon, and City of Roseville described above led to a proposal to develop an ORV track in an appropriate location in West Placer. Since ORV use is rapidly increasing, it is thought that providing suitable places for ORV use may reduce mis-use of natural areas. Based on interest from local officials and the state off-highway vehicle recreation commission DCC helped organize representatives of Placer County, Cities of Roseville and Rocklin, and officials of the state ORV recreational commission plan a meeting to discuss the proposal. DCC also investigated several possible locations in the City of Roseville and Placer County and found that people are reluctant to incorporate ORV use into their facilities and that it may be difficult to find a location for a public facility.

Unfortunately this process stalled when the leading citizen proponent needed heart surgery. But the AMA continues to participate in a process to develop a privately owned off-road facility in the north part of Roseville that will allow public access at certain times.

Deliverables:

Meeting notes from numerous meeting were delivered.

Task 6.3:

Planning: DCC met with several restoration contractors to discuss their approach to restoring the area. Mark White of Placer County RCD worked with the City of Roseville to develop an agreed on plan for the area. 40 sites were identified for potential treatment, photos of the sites were taken, keyed to an aerial photo, and treatments proposed for each site. The plan was submitted to the City of Roseville for comment and no significant objections or concerns were voiced.

After City of Roseville approval, in concept, a contractor was engaged to assist the implementation of the project. After observing current conditions at the site and making minor changes to planned area treatments the project proposal was submitted to the City of Roseville for processing. The city agreed to seed a large area on the other side of the creek that had been used for a dirt bike track and after further field meetings that resulted in minor changes in the seed mix and clarification of spots to be treated, seeding was implemented. Emphasize was placed on native seed suited for erosion control and used no fertilizer based on Dept. of Fish and Game preference due to nearness to the stream. Two meetings included several Sutter Hospital staff who agreed to hear our concerns regarding access from hospital property, storm runoff impacts from hospital property, and seepage from hospital property that has impacts on the native ecosystem.

DCC met with the city stormwater inspector onsite to garner any concerns regarding the project and resulting in the approval to proceed.

Exclusion of Vehicles: A parallel process to re-vegetation was to close access points to illegal vehicles. As early as October of 2000, DCC provided City of Roseville with information about entry points. Closing ORV access was a major recommendation of the existing condition report which was part of the Secret Ravine Adaptive Management Plan, December 2001.

In the past six years many of these entry points have been closed due to local government efforts and development of property adjacent to the open space. These efforts have been largely due to residents consistent requests to exclude vehicles from the open space.

The result of these actions has been a marked decrease in vehicle traffic in the open space. We now seldom encounter vehicles and see evidence of few vehicles when visiting the site. Thus far no significant damage has been done to the project.

Implementation: Over the years, *Creek Week* volunteers have removed trash from the site and pointed out trash they can't carry to the City for removal. Trash has included abandoned cars and parts, dumped household garbage, appliances, used motor oil and filters, solvents, and construction trash such as sheetrock and plate glass.

Work with Sutter Hospital resulted in their staff investigating the source of dry season runoff that had created a large gully and eroded the stream bank. The hospital has also worked consistently to identify the source of seepage that has created wet areas where wetland plants such as willows, sedges and exotics have begun to grow. This seepage also appears to be killing Blue Oaks within the preserve. Thus far there is no good answer as to the source of seepage.

In fall of 2006 DCC needed to complete repair and revegetation due to the coming end of the grant term. The area was reasonably clean and illegal vehicle access had been minimized. Our repair and revegetation plan consisted of ripping the surface of compacted areas such as roads and hillsides used for climbing vehicles, spreading native seed on all bare areas and lightly raking it to ensure seed contact with the earth. Spreading native straw on relatively flat areas that had been seeded, installing coconut fiber matting on steep hillsides to hold seed in place, installing water bars on steep hillsides to guide runoff into vegetated and less erodable areas, and planting willow cuttings in the worst areas of creek bank erosion. These activities were carried out by contractors and volunteers on September 9th and 30th and November 4th. Because the sites treated are spread for about a mile along the ravine access to the site was very limited. Straw has been distributed through the site on the hospital side of the creek. Rolls of coconut matting and wattles used for water bars were carried by volunteers to where they were used. The restoration contractor demonstrated the techniques for the various treatments. Volunteers provided tools such as shovels, rakes hammers, loppers, etc. About thirty-seven volunteers worked on the revegetation effort.

Seven volunteers who had worked on previous days returned to work on a site across the creek from the hospital that had been used for years as a dirt bike track. Numerous dirt and structural jumps had been constructed and trash was spread throughout the site. The trash was gathered and pieces too big to carry out were piled up for city removal. The tractor smoothed out the dirt hills and scratched the packed down areas. The volunteers then used mats, wattles, and seeds for erosion control as they had learned to do on previous workdays. The hotel adjacent allowed access and is working on closing access. At this writing the erosion control measures are in place and no attempt to rebuild the track has been made.

A wide variety of volunteers included fishing clubs, high school students, peer court, city employees and other government staff, DCC members, and other interested people. As always, volunteers were surprised and impressed with the quality of the natural area. The weather was very good and volunteers expressed pleasure in being outside in a natural setting and appreciated the opportunity to contribute to the Preserve's well being.

Deliverables:

Before and after photo documentation have been provided for 40 restoration sites. Sign-in sheets and a sample of emails used for recruitment were also delivered. A list of seed type has also been delivered. All volunteers signed liability waivers as required by the City of Roseville.

Task 6.4:

Citizens monitored the area informally for several years to assess vehicle traffic. In addition to the plan and photos provided by Mark White, a volunteer did a walk-through survey and took photos of problem areas and evidence of vehicle damage.

Although we did an instream habitat survey of the creek from the confluence of Secret Ravine and Miners Ravine to Rocklin Road, that data was lost when the GPS unit it was recorded on, stopped working. We had hoped to get a baseline condition to compare to in later years.

We have done two years of benthic macro-invertebrate sampling near the site with the accompanying riparian assessment. Since it is too soon to expect changes due to this fall's project we will look for improvement in later years. It may be difficult to detect changes due to the project since there are so many influences on the habitat from other parts of the watershed.

Deliverables:

The two years of taxonomic data were delivered. Analysis of the data will be conducted in the next few months with metrics comparison for the two years to be conducted at that time.

Task 6.5:

A Project Report summarizing results of the Secret Ravine project activity carried out for Tasks 6.1 to 6.4, problems encountered, and eventual outcome was developed.

Deliverable:

Project Summary Report has been delivered.

Reported Match:

This project took place over a number of years. It began before the grant was in place and will continue after the grant ends. The barriers, signs, and other products shown in photos in the final report are the result of countless contacts with staff of Sutter Hospital, cities of Roseville and Rocklin, and others. None of these contacts have been used as matching. All hourly rates for personnel matching other than project manager are calculated at \$15 per hour. This is a small fraction of what a city staff person or hospital staff person would bill.

The barrier costs are estimates based on knowledge of similar construction projects. Organizations don't typically report such costs to DCC even though they are the result of DCC efforts over a long period of time. In the case of the Sutter Hospital post and cable barrier the hospital supplied the estimates they were given by contractors. Some of these barriers are the result of citizen pressure put on local jurisdictions. It wouldn't be feasible to try to document all their phone calls and meetings with staff and developers.

The most exciting product of this grant is the increase in awareness of the problems of maintaining open space and the increase in resources devoted to maintaining it. We can't estimate how much of that increase is due to the project. For example, the City of Roseville now has created a position for an open space manager who will work on comprehensive signage and assure appropriate use by, for example, installing barriers to exclude vehicles from natural areas.

The QAPP costs are those paid to DCC through prior grant funding. DCC was not allotted overhead for the project and those costs were declared as match for a minimal amount.

Match reported for this task totaled \$80,850.85.

Task 7. Sustainable Land Stewardship Institute (SLSI):

Purpose and Scope of Project:

The goals of the project were to revise the existing Rapid Bioassessment Manual to include updated USEPA and CA Stream Bioassessment protocols to be used in the on-going training of citizen monitors. Sustainable Land Stewardship Institute (SLSI) a known and respected trainer of citizen monitors was to update the manual and further refine the citizen monitor training curriculum to address conditions in Lower Sacramento River watersheds by conducting nine to twelve workshops for citizen monitors from three Lower Sacramento River watersheds.

Challenges:

The additional bioassessment protocols to be included in an updated manual have yet to be approved by Surface Water Ambient Monitoring Program (SWAMP). With final updates predicated on this approval, the final edition is not expected to be available for printing and distribution until the spring following the end of the Agreement. A draft revision of the manual has been provided as a final deliverable for Task 7.1.

Project Task List:

Task 7.1:

SLSI organized the material to be included in the revised manual and was partially completed by editing sections that need to be revised based on information garnered during workshops and audits conducted during the previous year. Due to the revised bioassessment procedures still undergoing the SWAMP approval process, they were not ready for inclusion into the revised manual. A final edition of the revised manual is not expected to be available for printing and distribution until spring 2007.

Deliverables:

SLSI delivered a draft manual as a product for this task, pending approval of revised protocols.

Task 7.2:

Curriculums were developed to help groups analyze their bioassessment data and audit field and laboratory procedures. Information from Task 7.1 was used to revise and update the curriculum and produce materials for handing out at each workshop.

Deliverables:

The curriculums for the following workshops were delivered:

The Freshwater Bioassessment Workshops Part 1, a three day workshop consists of two days of classroom training and one day of hands-on field bioassessment training. Day one focused on classroom training in the design of freshwater ecological assessments using both rapid and fully integrated approaches. Day two focused on class room training in physical/habitat assessment for water quality projects. Day three focused on field work and the sampling of biotic communities in CA rivers and streams and introduced the new techniques undergoing review by SWAMP for final approval.

The following groups received Freshwater Bioassessment Workshops Part 1 training: Friends of Deer Creek, Grass Valley (16 participants); South Yuba River Citizens League, Grass Valley (18 participants); Upper Putah Creek and Upper Cache Creek Watershed Groups, Upper Lake (16 participants in a two day workshop, 21 participants in a three day workshop); Dry Creek Conservancy, Rocklin (18 participants); Butte County RCD, Chico (18 participants); Alpine Watershed Group, Markleyville; and Cottonwood Creek Watershed and RWQCB 5, Cottonwood (16 participants).

The Aquatic Ecological Assessment Workshops Part 2, a three day workshop consists of three days of classroom training on bioassessment data analysis. Day one focused family-level

taxonomic identification of freshwater invertebrates. Day two focused on the continuation of invertebrate taxonomy and the insurance of quality data and the calculation of biological metrics. Day three focused on interpreting biological metrics and current topics on the use of freshwater ecological assessments in water quality regulation.

The following groups received Aquatic Ecological Assessment Workshops Part 2 training: Upper Putah Creek and Upper Cache Creek Watershed Groups, Upper Lake (30 participants, two three day workshops); Dry Creek Conservancy, Rocklin (18 participants); Butte County RCD, Chico (18 participants).

Aquatic Ecological Assessment Workshops, a two day refresher course consists of one half day of classroom training and one and one half days of field work. Day one focused in the classroom on the concepts of freshwater ecological assessments in the morning and sampling biotic communities in CA rivers and streams in the afternoon. Day two focused on in the field training for physical /habitat assessments for water quality projects.

The South Yuba River Citizens League, the Upper Putah Creek Watershed Group, and the Upper Cache Creek Watershed Group also participated in audits on field work procedures.

Friends of Deer Creek participated in an audit on lab procedures.

Reported Match:

Reported match for this task is derived from volunteer hours in terms of participating in citizen monitoring training and totals \$41,744.91 representing 2,716 hours and \$15.37 per hour of volunteer effort to become knowledgeable in bioassessment techniques and protocols to use in their individual and group watershed stewardship efforts. Upon final analysis of match contributions for this task, \$969.19 in match was not reported on past progress reports and is derived from volunteer hours.

Task 8: Final Report:

Project Task List:

Task 8.1:

The Placer County Resource Conservation District (RCD) submitted a draft final report for review and comment that detailed the results of each project task and included the required narrative sections; an executive summary, statement of purpose and scope of the overall project, background on overall approach, techniques utilized during the project, and an outline of project tasks and information regarding challenges that presented themselves in the course of implementing this project and their impacts on deliverables.

Task 8.2:

The RCD submits a draft final report for review and comment by the state board

Match Recap:

The Agreement required a match of \$154,794. A total of \$194,151.17 was reported for match and exceeded the targeted goal by \$39,357.17.

Comments:

In summary, this entire project was a success even in the face of setbacks both in terms of dealing with a shortened timeframe in which to accomplish the tasks set forth in the Agreement, but also in terms of unfavorable weather conditions that directly impacted citizen monitoring efforts. In the face of such setbacks, both the Upper Putah Creek Stewardship and the West

Lake Resource Conservation District on behalf of the Upper Cache Creek watershed performed admirably by maintaining volunteer citizen monitors, teachers, and students interest in locally based monitoring efforts even when unable to get out in the field as expected. The Dry Creek Conservancy deserves praise in terms of getting stakeholders engaged in directly dealing with a problem that has proven hard to control, the illegal use of Off Road Vehicles within a preserve area and the initiation of a serious dialogue with those that have the wherewithal to deal with a growing issue by potentially providing areas where this kind of recreation can be accommodated in an appropriate manner in an appropriate place. The Sustainable Land Stewardship Institute continues to provide excellent training to citizens and stakeholders wanting to engage in the stewardship of their watersheds through the use of rapid bioassessment techniques, providing them the tools in which to do so.

The contractors in this project have been a pleasure to work with and have demonstrated their commitment and ability to deal with complex issues as well as being able to inspire stakeholders to become a very real part of the solution to those issues.

In closing, the entire project has been a success that continued to build a solid foundation and nurtured citizen stewardship and monitoring efforts to another level of achievement and knowledge in a continuing effort to promote healthy tributary watersheds of the Lower Sacramento River watershed.