



# San Francisco Bay Regional Water Enhancement Program

# Attachment 6

## MONITORING, ASSESSMENT, AND PERFORMANCE MEASURES

Association of Bay Area Governments  
Proposition 84  
Integrated Regional Water Management  
Round 2, Implementation Grant Application





**Introduction**..... 1

**Project 0:** Grant Administration..... 2

**Project 1:** Bay Area Regional Conservation and Education Program ..... 3

**Project 2:** East Bayshore Recycled Water Project Phase 1A (Emeryville)..... 7

**Project 3:** Lagunitas Creek Watershed Sediment Reduction and Management Project..... 8

**Project 4:** Marin/Sonoma Conserving Our Watersheds: Agricultural BMP Projects..... 10

**Project 5:** Napa County Milliken Creek Flood Damage Reduction, Fish Passage Barrier Removal and Habitat Restoration Project ..... 12

**Project 6:** North Bay Water Reuse Program – Sonoma Valley CSD 5th Street East/McGill Road Recycled Water Project..... 13

**Project 7:** City of Oakland Sausal Creek Restoration Project..... 14

**Project 8:** Pescadero Water Supply and Sustainability Project ..... 16

**Project 9:** Petaluma Flood Reduction, Water & Habitat Quality, and Recreation Project for Capri Creek17

**Project 10:** City of Redwood City Bayfront Canal Flood Management and Habitat Restoration Project.. 18

**Project 11:** Regional Groundwater Storage and Recovery Project Phase 1A - South Westside Basin, Northern San Mateo County..... 18

**Project 12:** Richmond Breuner Marsh Restoration Project ..... 19

**Project 13:** Roseview Heights Infrastructure Upgrades for Water Supply and Quality Improvement, Santa Clara County..... 20

**Project 14:** San Francisco Bay Climate Change Pilot Projects Combining Ecosystem Adaptation, Flood Risk Management and Wastewater Effluent Polishing..... 21

**Project 15:** San Francisco International Airport Reclaimed Water Facility..... 22

**Project 16:** San José Green Streets & Alleys Demonstration Projects..... 23

**Project 17:** San Pablo Rheem Creek Wetlands Restoration Project ..... 25

**Project 18:** St. Helena Upper York Creek Dam Removal and Ecosystem Restoration Project ..... 26

**Project 19:** Students and Teachers Restoring a Watershed (STRAW) Project—North and East Bay Watersheds ..... 28

## 6. MONITORING, ASSESSMENT, AND PERFORMANCE MEASURES

### Introduction

Section C of the San Francisco Bay Area IRWM Plan (2006) identifies the regional goals and objectives of the Bay’s integrated water management plan. Primary regional goals include:

- Contribute to the promotion of economic, social, and environmental sustainability
- Contribute to improved water supply reliability
- Contribute to the protection and improvement of hydrologic function
- Contribute to the protection and improvement of the quality of water resources
- Contribute to the protection of public health, safety, and property
- Contribute to the creation, protection, enhancement, and maintenance of environmental resources and habitats

These goals were developed based on the region’s common interests and the specific water management needs and challenges of the Bay Area as described in the IRWM Plan (Table C-1, Bay Area IRWM Plan, 2006). These goals can be met through successfully achieving the many objectives which support these goals (Table C-2, Bay Area IRWM Plan, 2006). The projects included in this Proposal were specifically selected for their direct alignment with the Bay Area IRWM Plan goals and objectives.

This attachment of the Proposal describes the measures that will be used to quantify and verify project performance. The tables below summarize how the proposed projects will be monitored, assessed, and measured to ensure that the projects, both individually and collectively, achieve the region’s IRWM goals and objectives. The tables demonstrate that the Proposal will meet its intended goals, achieve measurable outcomes, and provide value to the State of California. The information presented in this attachment will be incorporated into project-specific monitoring plans. The monitoring and performance data collected for the proposed projects will also support other Bay Area regional initiatives. For example, the quantitative wetland data collected by several projects in this Proposal will contribute to the region’s California Wetlands Portal, a regional wetland habitat tracking database.

While all of the columns in the tables below are valuable, the key to understanding how this Proposal will result in supporting the State’s goals for the IRWM program is found in the “Performance Indicators” and “Measurement Tools and Methods” columns. The Performance Indicators identify clear metrics that will be monitored and recorded to evaluate progress. The Measurement Tools and Methods column describes the methods by which the indicators will be measured, monitored, or assessed. Many of the Performance Indicators in this Proposal are measured directly with collected physical data such as the volume of reduced water demand, volume of flows in creeks, physical measurement of pollution retention, volume of recycled water use, area of increased riparian vegetation, area of improved habitat conditions, and other physical metrics.

**Project 0: Grant Administration**

<b>Project Goals</b>	<b>Desired Outcomes</b>	<b>Targets</b>	<b>Performance Indicators</b>	<b>Measurement Tools and Methods</b>
Form a committee to oversee grant administration	Fair decision-making and representation for direction of grant administration activities.	Timely submission of satisfactory reports; clear and adequately documented invoices; timely payments to Local Project Sponsors (LPS).	Active participation in calls/meetings and responsiveness to information requests.	<ul style="list-style-type: none"> <li>▪ Detailed work plans, schedules, budgets; well-documented invoices; and, timely resolution of any outstanding issues.</li> <li>▪ Call/meeting summaries; progress reports; invoices to DWR; payments from DWR; payments to LPS.</li> </ul>
Set up Legal Agreements for grant funding	Legal arrangements to cover all of the conditions embodied by the Grant Agreement between DWR and ABAG.	Execution of all agreements in a timely fashion.	Acceptable terms and conditions, including work plan, budget and schedule.	<ul style="list-style-type: none"> <li>▪ Governing body approval of agreements by all participating entities.</li> <li>▪ Executed agreements with local project sponsors.</li> <li>▪ DWR execution of grant agreement.</li> </ul>
Maintain records and financial records	Well-organized grant records, confirmation of progress, and certified accounting.	100% payout of all grant funds due (less applicable retention); no exceptions on financial reports; continuous availability of reporting info on website.	Regular updates and reports on grant administration activities, including financial info.	<ul style="list-style-type: none"> <li>▪ Certified financial statements and problem-free financial transactions.</li> <li>▪ Monthly financial records, field reports and photos, invoice records, correspondence.</li> </ul>

**Project 1: Bay Area Regional Conservation and Education Program**

<b>Project Goals</b>	<b>Desired Outcomes</b>	<b>Targets</b>	<b>Performance Indicators</b>	<b>Measurement Tools and Methods</b>
Successfully implement the High-Efficiency Toilet Program	<ul style="list-style-type: none"> <li>▪ Increase high-efficiency product availability.</li> <li>▪ Increase access to high-efficiency products for low-income populations through rebates.</li> <li>▪ Improve consumer acceptance and awareness of high-efficiency products.</li> <li>▪ Promote the U.S. EPA WaterSense product label.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Replace 2,300 high-water using toilets with High-Efficiency Toilets</li> <li>▪ Achieve total potable water savings of 781 acre-feet over the lifespan of the installed fixtures.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Number of rebates issued over the course of the program.</li> <li>▪ Water savings achieved from HETs rebated</li> <li>▪ Customer satisfaction with program</li> </ul>	<ul style="list-style-type: none"> <li>▪ Staff will track number of rebates issued and associated water savings.</li> <li>▪ Staff will send out customer surveys to all participants to assess customer perception of how effectively the program was administered and quantify overall level of customer satisfaction.</li> </ul>
Successfully implement the High-Efficiency Washer Rebate Program	<ul style="list-style-type: none"> <li>▪ Improve consumer acceptance of high-efficiency clothes washers.</li> <li>▪ Increase product availability.</li> <li>▪ Improve affordability of high-efficiency clothes washers.</li> <li>▪ Reduce energy use and carbon emissions by reducing pumping and treatment for water and wastewater and reducing hot water end use.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Provide rebates for the purchase and installation of 5,750 high-efficiency clothes washers.</li> <li>▪ Purchase and install 51,000 high-efficiency clothes washers.</li> <li>▪ Achieve water savings of more than 1,400 acre-feet over the 10-year lifespan of the appliances.</li> </ul>	<ul style="list-style-type: none"> <li>▪ HEWs rebated through this program will have a water factor of no more than 4<sup>1</sup>.</li> <li>▪ Number of rebates issued over the course of the program.</li> <li>▪ Water savings achieved from HEWs rebated.</li> <li>▪ Customer satisfaction with program.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Use the Consortium for Energy Efficiency's specifications for clothes washer "water factors."</li> <li>▪ Staff will track number of rebates issued and associated water savings.</li> <li>▪ Staff will send out customer surveys to all participants to assess customer perception of how effectively the program was administered and quantify overall level of customer satisfaction.</li> </ul>
Successfully implement the Water-Efficient Sustainable Landscape Education	<ul style="list-style-type: none"> <li>▪ Provide outreach, education and trainings to convert traditional</li> </ul>	<ul style="list-style-type: none"> <li>▪ Hold 20 water-efficient gardening events and hold 10 professional training courses, targeting 1200 home gardeners</li> </ul>	<ul style="list-style-type: none"> <li>▪ Training and education will result in 200 lawns converted to water-efficient landscapes equating to</li> </ul>	<ul style="list-style-type: none"> <li>▪ The Program will track the number of water-efficient gardening events and produce expos held, and the number of participants and</li> </ul>

<sup>1</sup> The water factor for Tier 3 clothes washers is 2.4-4.0. A lower number indicates lower consumption and the highest efficiency. The Consortium for Energy Efficiency developed the specification for water factors.

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
Program (Bay-Friendly)	<p>urban landscaping to water-efficient and sustainable landscaping and support the water-efficient landscape and weather-based irrigation controller rebates.</p> <ul style="list-style-type: none"> <li>▪ Support the water-efficient landscape rebate program by increasing installation of low water-use gardens, and ensure the longevity of the resulting water savings.</li> <li>▪ Reduce the potential greenhouse gas impacts from the transport and landfilling of the plant debris, the use of herbicides and nonpoint source pollution of waterways by teaching professionals and home gardeners how to sheet mulch the lawn in place.</li> </ul>	<p>and landscaped professionals.</p> <ul style="list-style-type: none"> <li>▪ Reach a least 20,000 consumers via outreach campaign to publicize landscaping and gardening water-conservation and rebate messages, using traditional &amp; social media outlets.</li> <li>▪ Conduct onsite training of staff at five nurseries to promote successful communication with customers about water conservation and rebates.</li> <li>▪ Produce four online videos on water-efficient sustainable landscaping.</li> <li>▪ Produce and distribute a pocket guide to water-conserving plants that thrive in the Bay Area.</li> </ul>	<p>350,000 square feet of turf removal.</p> <ul style="list-style-type: none"> <li>▪ 10,000 views of online videos</li> <li>▪ 2,000 pocket guides printed and distributed</li> <li>▪ 10,000 visitors to online clearinghouse</li> <li>▪ 400 landscape professionals trained in and implementing water-efficient sustainable landscape practices</li> </ul>	<p>education materials distributed at those events.</p> <ul style="list-style-type: none"> <li>▪ Follow-up communications with program participants will be conducted to measure behavior changes and estimate water savings.</li> <li>▪ Landscape professionals that participate in these training events will be contacted to document whether they offer sheet mulching and lawn conversion services post-training.</li> <li>▪ Surveys of landscape professionals and home gardeners will be conducted to measure and evaluate behavior changes resulting from participation in events and trainings, use of program’s educational materials, evaluate lawn conversion knowledge pre- and post-training.</li> <li>▪ Conduct surveys of the number of participating nurseries and the number of nursery staff trained.</li> <li>▪ Report of website activity, analytics and metrics. The report will include the number of views of online videos and visitors to the online clearinghouse reference web page.</li> </ul>
Successfully implement the Water-Efficient Landscape and Weather-Based Irrigation Controller (WBIC) Rebate	<ul style="list-style-type: none"> <li>▪ Promote environmental sustainability and improve environmental stewardship by reducing potable water use, carbon emissions from mechanized gardening, and fertilizer, herbicide and pesticide laden water runoff into local</li> </ul>	<ul style="list-style-type: none"> <li>▪ Replace 1.3 million square feet of lawn with water efficient and sustainable landscaping by providing financial incentives to customers.</li> <li>▪ Achieve potable water savings of approximately 1,060 acre-feet over a ten-year period.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Number of rebates issued over the course of the program.</li> <li>▪ Water savings achieved from landscape and WBIC rebates</li> <li>▪ Customer satisfaction with program</li> </ul>	<ul style="list-style-type: none"> <li>▪ Staff will track number of rebates issued and associated water savings.</li> <li>▪ Agencies will monitor water demands to track reductions over time.</li> <li>▪ Staff will send out customer surveys to all participants to assess customer perception of how effectively the program was</li> </ul>

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
	<p>streams.</p> <ul style="list-style-type: none"> <li>▪ Improve landscape irrigation scheduling through customer education.</li> <li>▪ Focus outreach to target high-water users in residential and commercial, industrial and institutional (CII) sectors.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Install approximately 7,345 weather-based irrigation controllers.</li> <li>▪ Achieve water savings of approximately 550 acre-feet over the 10-year lifespan of the equipment.</li> </ul>		<p>administered and quantify overall level of customer satisfaction.</p>
<p>Successfully implement the Large Landscape Irrigation System Retrofit Program (SFPUC)</p>	<ul style="list-style-type: none"> <li>▪ Improve irrigation efficiency, install appropriate plantings, and improve landscape uses at large landscape sites.</li> <li>▪ Reduce water use while maintaining functionality of a landscape.</li> <li>▪ Educate public on landscape efficiency measures.</li> <li>▪ Target large landscape owners and/or managers in the CII sectors.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Retrofit at least one large landscape site with new irrigation, controllers, plantings and educational signage.</li> <li>▪ Achieve potable water savings of approximately 12 acre-feet a year.</li> <li>▪ Achieve water savings of approximately 266 acre-feet over the 20-year lifespan of the system.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The large landscape site selected for grant funding will permanently reduce irrigation water use and maintenance costs.</li> <li>▪ Increased awareness by the public about efficient landscaping practices</li> </ul>	<ul style="list-style-type: none"> <li>▪ The project’s proposed new irrigation system and plantings must pass a project plan review and comply with the requirements of the Water Efficient Landscape Ordinance.</li> <li>▪ The site’s water use is maintained within the boundaries of the established Maximum Applied Water Allowance (MAWA)</li> <li>▪ The project will be included as part of a landscape water budget program. Irrigation water use will be monitored on a monthly basis and reports comparing actual water use with the MAWA will be distributed to the site owners and managers.</li> </ul>
<p>Successfully Complete Home Water Reports</p>	<ul style="list-style-type: none"> <li>▪ Provide customers with individualized water use reports and water scores as compared to other homes or businesses with similar characteristics and</li> </ul>	<ul style="list-style-type: none"> <li>▪ Complete procurement of professional services prior to the anticipated award date of October 1, 2013.</li> <li>▪ Send Home Water Reports to 203,000 Single-Family households within the grant</li> </ul>	<ul style="list-style-type: none"> <li>▪ Procurement of services by target date.</li> <li>▪ 101,500 reports issued within first year of project and 203,000 within grant funded period.</li> </ul>	<ul style="list-style-type: none"> <li>▪ A specific monitoring plan will be developed within the first quarter of the project.</li> <li>▪ Outgoing communications and customer response tracking will be ongoing.</li> <li>▪ Water Consumption data feeds</li> </ul>

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
	<p>demographics.</p> <ul style="list-style-type: none"> <li>▪ Obtain on-line registrations of targeted customers receiving water use reports.</li> <li>▪ Provide customized water saving recommendations.</li> <li>▪ Increase participation in financial incentive elements of the Water Conservation Project.</li> <li>▪ Track customer response to specific messages and the implementation of conservation recommendations.</li> </ul>	<p>funding period; 101,500 within the first year of project implementation.</p> <ul style="list-style-type: none"> <li>▪ Obtain on-line registration of at least 5 percent of households receiving Home Water Report.</li> <li>▪ Actual demand reduction of at least 2 percent by participants compared to a control group.</li> <li>▪ Achieve potable water savings of 768 AF each year.</li> <li>▪ Achieve water savings of approximately 4,610 over the 6 year lifespan.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Tracked customer responses to reports including on-line registration of at least 5 percent of participating households.</li> <li>▪ Actual demand reductions.</li> </ul>	<p>will be basis for evaluation of participant demand reduction relative to a non-participating control groups.</p> <ul style="list-style-type: none"> <li>▪ Demand reduction evaluation intervals will be determined based upon available consumption data.</li> <li>▪ The online water utility dashboard will include standardized automated reports on project outcomes.</li> </ul>
<p>Successfully implement the Water Conservation and Mobile Water Lab Project</p>	<ul style="list-style-type: none"> <li>▪ Provide outreach and educational workshops to agricultural landowners/managers.</li> <li>▪ Conduct irrigation system evaluations.</li> <li>▪ Recommend water conservation and water quality improvements.</li> <li>▪ Share valuable technology and information with growers.</li> <li>▪ Assist growers in obtaining necessary funds to implement recommendations.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Provide two informational workshops.</li> <li>▪ Conduct 48 on-site irrigation system evaluations.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Achieve potable water savings of approximately 44 acre-feet a year.</li> <li>▪ Achieve water savings of approximately 442 acre-feet over the 20-year lifespan of the system.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Track the number of workshops hosted</li> <li>▪ Track the number of on-site irrigation system evaluations completed</li> <li>▪ Track the number of outreach and educational materials distributed</li> <li>▪ Track the number of participants pursuing implementation of recommendations</li> </ul>

**Project 2: East Bayshore Recycled Water Project Phase 1A (Emeryville)**

<b>Project Goals</b>	<b>Desired Outcomes</b>	<b>Targets</b>	<b>Performance Indicators</b>	<b>Measurement Tools and Methods</b>
Reduce regional dependence on imported water supplies.	Reduced water demand using recycled water in place of potable water for beneficial uses.	Deliver recycled water to offset the use of potable water – 2.5 MGD (2,800 AFY) for project at buildout. The Phase 1A (Emeryville) Project will initially deliver 0.04 MGD (50 AFY) and will ultimately deliver 0.32 MGD (360 AFY) when the remainder of the I-80 transmission pipeline is complete.	<ul style="list-style-type: none"> <li>▪ Reduced potable water flow/production measured the treatment plant.</li> <li>▪ Reduced potable water demand from customers.</li> <li>▪ Increased recycled water demand from customers.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Flow meter monitoring at the treatment plant.</li> <li>▪ Water use monitoring from meter readings at customer sites.</li> </ul>
Reduce discharges of treated wastewater to San Francisco Bay	Help realize TMDL goals for San Francisco Bay	Offset treated wastewater discharges to SF Bay by 2.5 MGD (2,800 AFY) due to buildout of the EBRWP.	Flow/production measured at treatment plant and recycled water demand measured at customer sites.	Flow monitoring at treatment plant and periodic customer water meter reading for billing

References: See Attachments 3 and 8

**Project 3: Lagunitas Creek Watershed Sediment Reduction and Management Project**

<b>Project Goals</b>	<b>Desired Outcomes</b>	<b>Targets</b>	<b>Performance Indicators</b>	<b>Measurement Tools and Methods</b>
<b>Water Quality Improvement</b> Reduce sediment loading into Lagunitas Creek	Implement culvert replacement improvements at stream crossings of the Cross Marin Trail to stop erosion and reduce sediment loss.	Existing, undersized and failing culverts at Cross Marin Trail stream crossings replaced with culverts or arch culverts sized for the 100-year storm event.	Integrity of the Cross Marin Trail at improved stream crossings and ability to pass the 100-year storm flows.	Site inspections and photo-monitoring of the Cross Marin Trail under high flow events. Streambed monitoring surveys in mainstem Lagunitas Creek.  Monitoring will be implemented according to the following methods: <ul style="list-style-type: none"> <li>▪ Lagunitas Creek Stewardship Plan – Appendix D (Aquatic Resource Survey and Monitoring Methodologies; MMWD 2011).</li> <li>▪ Sediment and Streambed Monitoring Plan for Lagunitas Creek (O’Connor Environmental 2012).</li> </ul>
<b>Water Supply Reliability</b> Stabilize and secure a major water supply transmission line	Secure the Nicasio Transmission Line at the stream crossings.	Cross Marin Trail engineered fills reestablished to support the Nicasio Transmission Line.	Improved reliability of water conveyance through the Nicasio Transmission Line.	Evaluate records of conveyance of water through the secured Nicasio Transmission Line.
<b>Recreation Improvement</b> Reestablish and stabilize an important recreational trail	Stabilize the Cross Marin Trail at the stream crossings.	Cross Marin Trail road surface reestablished stabilized to engineered specifications for travel.	Improved integrity of the surface of the Cross Marin Trail, for use by all recreational uses and equipment.	Site inspections of the Cross Marin Trail. Monitoring will be implemented according to the following methods: <ul style="list-style-type: none"> <li>▪ Lagunitas Creek Stewardship Plan – Appendix D (Aquatic Resource Survey and Monitoring Methodologies; MMWD 2011).</li> </ul>

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
<p><b>Habitat Improvement</b></p> <p>Improve passage for salmonids into small tributaries to Lagunitas Creek</p>	<p>Improve fish passage into small tributary streams to Lagunitas Creek to be managed as habitat for anadromous salmonids.</p>	<p>Newly installed culverts of sufficient size, configuration, and gradient to allow upstream passage of adult salmonids and downstream passage of juveniles.</p>	<p>Passage of adult and juvenile anadromous salmonids into and out of the tributary streams, at the improved crossings</p>	<p>Adult salmonid spawner surveys and juvenile snorkel or electrofishing surveys in the tributary streams where improvements have been implemented.</p> <p>Monitoring will be implemented according to the following methods:</p> <ul style="list-style-type: none"> <li>▪ Lagunitas Creek Stewardship Plan – Appendix D (Aquatic Resource Survey and Monitoring Methodologies; MMWD 2011).</li> </ul>
<p><b>Habitat Improvement</b></p> <p>Provide potential additional winter refuge for salmonids</p>	<p>Increase channel capacity at the tributary stream crossings.</p>	<p>Newly installed culverts with greater channel capacity than the existing, undersized culverts.</p>	<p>Increased hydrologic capacity of tributary streams at improved crossings.</p>	<p>Pre- and post-construction photographic and video documentation of hydrology at tributary stream crossings under high flow conditions.</p>

## References:

- MMWD. 2011. *Lagunitas Creek Stewardship Plan*.
- O'Connor Environmental. 2012. *Sediment and Streambed Monitoring Plan for Lagunitas Creek For MMWD*.

**Project 4: Marin/Sonoma Conserving Our Watersheds: Agricultural BMP Projects**

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
<p>Improve water quality</p>	<ul style="list-style-type: none"> <li>▪ Reduce erosion and sedimentation to improve upon significant spawning areas and reduce sedimentation of estuarine habitats.</li> <li>▪ Reduce nutrient and pathogen loading of streams draining into shellfish harvesting areas.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Management practices are predicted to result in a 50-75% reduction in fine sediment delivery from riparian fencing and revegetation projects and 75-95% reduction from headcuts, gullies and streambank repairs.</li> <li>▪ Management practices are predicted to result in a 60-90% reduction in nutrient and pathogen loading.</li> </ul>	<p>The resulting quantity of sediment, nutrients, and microbial pollution reduced will be dependent upon the total number of management measures implemented and the existing site conditions where the measures are implemented. Generally, the more measures applied, will result in greater water quality benefits. Specific measures to be monitored include:</p> <ul style="list-style-type: none"> <li>▪ Number of management practices completed</li> <li>▪ Miles of stream fenced</li> <li>▪ Linear feet of streambank repaired</li> <li>▪ Reduction in fine sediment delivery</li> <li>▪ Increase in percent bank stability</li> </ul>	<p>The program will be evaluated based on the following tools:</p> <ul style="list-style-type: none"> <li>▪ CDFW Salmonid Stream Habitat Restoration Manual (2010)</li> <li>▪ USDA NRCS Technical Office Field Guide</li> </ul> <p>Program progress will be monitored to calculate estimates of the level of pollutant retention achieved at sites to indicate individual management measure and overall project effectiveness. Project monitoring will be consistent with other watershed monitoring efforts currently being conducted by partner agencies and organizations such as the Tomales Bay Watershed Council (2003) and the State Regional Water Quality Control Board. Reporting of pathogen reductions may be conducted according to standard EPA monitoring protocols (USEPA 1997)</p>

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
Improve Wildlife Habitat	Revegetate Streams	<ul style="list-style-type: none"> <li>▪ Survival of at least 80% at each site for planted revegetation projects</li> <li>▪ Increase native riparian tree &amp; shrub cover by 65% at each site for revegetation projects</li> <li>▪ Increase woody plant species richness in the riparian zone by 50% at each site for revegetation projects</li> <li>▪ Reduced downstream water temperatures supporting improved habitat for threatened and endangered species.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Number of trees planted.</li> <li>▪ Survival of planted trees.</li> <li>▪ Increase in restored riparian areas.</li> <li>▪ Increase native tree and shrub cover, and diversity.</li> </ul>	Random sites will be selected and intensively monitored to quantify management practice effectiveness in detail according to the Marin RCD Riparian Zone Monitoring Plan (2010).

## References:

- California Department of Fish and Wildlife (CDFW). 2010. California Salmonid Stream Habitat Restoration Manual. 4<sup>th</sup> Edition. Available: <http://www.dfg.ca.gov/fish/Resources/HabitatManual.asp>
- Marin RCD. 2010. Riparian Zone Monitoring Plan. Available: <http://cesonoma.ucdavis.edu/files/76316.pdf>.
- Tomales Bay Watershed Council. 2003. Tomales Bay Watershed Water Quality Monitoring Plan. Available: <http://www.tomalesbaywatershed.org/waterqualitymonitoring.pdf>
- USDA Natural Resources Conservation Service. 2013. Field Office Technical Guide. Available: <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/fotg/>
- USEPA. 1997. Monitoring Guidance for Determining the Effectiveness of Nonpoint Source Controls. EPA 841-B-96-004. Available: <http://water.epa.gov/polwaste/nps/monitoringguidance.cfm>

**Project 5: Napa County Milliken Creek Flood Damage Reduction, Fish Passage Barrier Removal and Habitat Restoration Project**

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
Habitat Restoration in Milliken Creek	Remove an in-stream impoundment to allow for the reintroduction of anadromous fish populations to upper watershed.	Successful fish passage to spawning and rearing grounds in the upper watershed.	<ul style="list-style-type: none"> <li>▪ Evidence of steelhead spawning activity in reach above former dam location (i.e. presence of redds/nests).</li> <li>▪ Presence of rearing/foraging juvenile salmonids in reach above former dam site.</li> </ul>	CDFW Salmonid Stream Habitat Restoration Manual (2010): <ul style="list-style-type: none"> <li>▪ Steelhead spawner surveys.</li> <li>▪ Steelhead snorkel surveys.</li> <li>▪ Photographic documentation.</li> </ul>
Provide flood protection to a neighborhood of over 50 homes.	<ul style="list-style-type: none"> <li>▪ Improve flood flow passage through construction of a open channel bypass weir and free span bridge.</li> <li>▪ Grading and landscape improvement to allow low lying properties to receive comparable level of protection to adjacent properties.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Safely convey the 100-year flood.</li> <li>▪ Protect structures from the 100-year flood.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Lowered water surface elevation.</li> <li>▪ Stable longitudinal and cross sectional stream channel profile.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Site specific water surface and channel field surveys.</li> <li>▪ Post flood flow high water survey.</li> </ul>

References: See Attachments 3 and 8

**Project 6: North Bay Water Reuse Program – Sonoma Valley CSD 5th Street East/McGill Road Recycled Water Project**

<b>Project Goals</b>	<b>Desired Outcomes</b>	<b>Targets</b>	<b>Performance Indicators</b>	<b>Measurement Tools and Methods</b>
Reduce demand for potable water supply	Offset potable water imported from the Russian River, reduce groundwater pumping, and reduce surface water diversion from Sonoma Creek.	Provide approximately 200 AFY of tertiary treated recycled water for urban and agricultural irrigation demands.	Measure the volume of recycled water delivered to agricultural and urban users.	Install flow meter at every turnout. Collect monthly meter readings from users. Incorporate findings into quarterly and final reports.
Improve water quality and marine environment of North San Pablo Bay by reducing wastewater discharge into the Bay	Increased use of recycled water will reduce wastewater discharges and provide pollutant loading reductions.	It is anticipated that the project will decrease the loading of bacteria, bioaccumulative substances, biostimulatory substances, salinity, suspended material, and ammonia into receiving waters. It may also contribute to increased dissolved oxygen and decreased turbidity in San Pablo Bay.	Measure the volume of recycled water delivered to offset treated wastewater discharges.	The WWTP currently performs extensive quality and flow monitoring to comply with NPDES requirements. Influent and effluent flows will be collected, analyzed, and incorporated into quarterly and final reports.

References: See Attachments 3 and 8

**Project 7: City of Oakland Sausal Creek Restoration Project**

<b>Project Goals</b>	<b>Desired Outcomes</b>	<b>Targets</b>	<b>Performance Indicators</b>	<b>Measurement Tools and Methods</b>
Preserve the maximum number of trees possible	Remove minimal number of native trees in project area necessary to achieve project goals through grading and bank stabilization.	<ul style="list-style-type: none"> <li>Plant 84 native trees within the project area to mitigate for 33 native trees to be removed as part of the project.</li> </ul>	Ensure (post-restoration grading) that mature native trees form a significant canopy on left bank—right bank is private land. Ensure >90% of the preserved native trees survive in the first 5 years.	Survey retained and newly planted trees for health and survival rates to comply with the City of Oakland Tree Permit.
Protect public and private infrastructure	Stabilize creek banks that are currently experiencing significant persistent erosion	<ul style="list-style-type: none"> <li>2:1 grading of left bank and toe rock/willow armoring of right bank to prevent bank erosion.</li> <li>Willow soil bioengineering mortality of &lt;20%.</li> </ul>	<ul style="list-style-type: none"> <li>Graded left bank without rack line erosion from storm flows.</li> <li>Established revegetation of willow stakes and native riparian trees, shrubs, grasses and forbs.</li> <li>Right bank (adjacent to private/public infrastructure) does not require remedial erosion control, maintenance or slope reconstruction.</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring plan will be developed.</li> <li>Annual surveys will include creek channel profile, cross-sectional slope surveys, and geotechnical site reviews.</li> </ul>
Protect native rainbow trout and improve trout passage to upstream habitat	Increase population of resident native rainbow trout by 25% at the end of 5 years.	Pre-project trout surveys will define numerical targets.	5% increase in trout population per year over 5 years.	CDFW Salmonid Stream Habitat Restoration Manual (2010): <ul style="list-style-type: none"> <li>Fish surveys</li> </ul>
Improve water quality	Reduce water temperatures, increase dissolved oxygen concentration, and reduce pollutants in stream flows	Average max. winter temp. 12° C; spring-fall max. 18° C; dissolved oxygen (mg/l) avg. min. 8.5, max 11.5; pH 7.0 min., 8.1 max.	Monitoring samples fall within desired target range.	SWAMP Standard Procedures (2007): <ul style="list-style-type: none"> <li>Monitor temperature, dissolved oxygen, pH, and conductivity</li> <li>Survey benthic macroinvertebrate</li> </ul>

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
Improve riparian habitat	Create 47,000 square feet of improved riparian habitat through successful establishment of a diverse native plant palette able to support populations of local native wildlife	<ul style="list-style-type: none"> <li>▪ 80% survival rate of newly planted species at end of five years.</li> <li>▪ Improve diversity of resident and migrating native bird species in project area.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Survival rate of plants meeting project goals.</li> <li>▪ Increase diversity of native bird species by 20% at end of 5 years.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Annual plant monitoring through transect counts.</li> <li>▪ Quarterly bird monitoring.</li> </ul>
Create a dynamically stable channel	Reduce on-going incision and bank failures.	Maintain a consistent hydraulic geometry over time.	Channel slope, bankfull width, pebble counts.	Annual geomorphic surveys.
Increase floodplain area	Increase floodprone area of creek.	Wider creek corridor, 1.5 times wider than existing channel width.	Floodprone width achieved.	Annual geomorphic surveys and cross-sections.
Provide appropriate creek access	Reduce creation of informal pathways that cause erosion and trampling of creekside vegetation.	Create two pedestrian access points into the project site	Measure usage of created paths and tracking of creation of informal pathways.	Ongoing visual monitoring.
Encourage Community Involvement and Stewardship	Build community connections and project stewardship through regular community-based events at project location	Attendance of at least 300 people annually at creek volunteer and educational events sponsored by the City of Oakland and/or the Friends of Sausal Creek.	4-6 annual community events at project site such as volunteer stewardship, educational events, and community gatherings.	Track event attendance.

## References:

- California Department of Fish and Wildlife (CDFW). 2010. California Salmonid Stream Habitat Restoration Manual. 4th Edition. Available: <http://www.dfg.ca.gov/fish/Resources/HabitatManual.asp>
- State Water Resources Control Board. 2007. Surface Water Ambient Monitoring Program (SWAMP) Standard Operating Procedures. Available: <http://swamp.mpsl.mlml.calstate.edu/resources-and-downloads/standard-operating-procedures#FieldMeasures>

**Project 8: Pescadero Water Supply and Sustainability Project**

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
<p><b>Improve Water Supply</b></p> <ul style="list-style-type: none"> <li>▪ Provide new water supply for a DAC</li> <li>▪ Increase water reliability</li> <li>▪ Improve groundwater performance</li> </ul>	<ul style="list-style-type: none"> <li>▪ Construction of a new well so that existing production Well No. 1 becomes a backup system.</li> <li>▪ Construction of a new storage tank.</li> <li>▪ Installation of a new alarm system.</li> <li>▪ Decrease in pumping from the shallow portion of the aquifer.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Supply water for 100 customers for 50+ years. The current well system has a remaining aquifer life of approximately 5 to 7 years, which puts the aquifer failure period by 2020 (HydroScience Engineers, 2013).</li> <li>▪ Increased storage capacity in the system.</li> <li>▪ Added redundancy to the water supply system</li> <li>▪ Improved warning system for pump failure and low tank volume.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Available drawdown at the new well is at least 90 feet. With a historical water level drop of 0.6 to 1.6 feet per year and maximum available drawdown of 90 feet, the life of the well is at least 50 years (HydroScience Engineers, 2013).</li> <li>▪ Pumping rate is at least 100 gpm to meet the design criteria for the well.</li> <li>▪ Alarms are activated during pump failure or when water level in tank reaches the low level set point.</li> <li>▪ Water level does not decrease by more than 1.6 feet per year in the new well.</li> <li>▪ Tank is structurally sound and does not leak.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Measure drawdown after well installation to determine how long the aquifer will last.</li> <li>▪ Perform pumping test to ensure that pump and well meet design specifications.</li> <li>▪ Measure water level in well annually at a minimum to ensure that groundwater is not being overdrawn and that well is sustainable for 50+ years.</li> <li>▪ Perform hydrostatic test on tank to ensure that tank doesn't leak.</li> <li>▪ Measure static water level and top of screen level annually.</li> <li>▪ Monitor inorganic groundwater annually to track water quality.</li> <li>▪ Test alarm system monthly.</li> </ul>
<p><b>Increase Conservation</b></p> <p>Implement voluntary water conservation measures</p>	<ul style="list-style-type: none"> <li>▪ Installation of high efficiency toilet/urinals and washers to replace low efficiency devices.</li> <li>▪ Increased public knowledge about water conservation methods and devices.</li> </ul>	<ul style="list-style-type: none"> <li>▪ 60 toilet/urinal replacements.</li> <li>▪ 40 washer replacements</li> <li>▪ High community attendance at workshops or surveys.</li> </ul>	<ul style="list-style-type: none"> <li>▪ 2 AFY reductions in water demand.</li> <li>▪ Installations are completed and devices are functional.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Track the number of installed high efficiency devices.</li> <li>▪ Track and compare water meter records from before high efficiency devices are installed to after devices are installed.</li> </ul>

Reverences: HydroScience Engineers, Inc. 2013. Technical Memorandum #1: Water Supply Reliability. March 19, 2013.

**Project 9: Petaluma Flood Reduction, Water & Habitat Quality, and Recreation Project for Capri Creek**

<b>Project Goals</b>	<b>Desired Outcomes</b>	<b>Targets</b>	<b>Performance Indicators</b>	<b>Measurement Tools and Methods</b>
Increase flood protection and improve storm water management	Channel recontouring and construction of flood terraces reduces peak flows	Peak flow reduction to existing out-of-bank flows of 60, 194, and 254 cubic feet per second in 10-year, 50-year, 100-year storms, respectfully	Flood impacts to: <ul style="list-style-type: none"> <li>▪ 4-6 single family residences on Nikki Drive</li> <li>▪ 18 single family residences on Woodside Circle</li> <li>▪ 68 space mobile home park all with anticipated flood depths in excess of 1'</li> <li>▪ A major arterial street</li> <li>▪ Local streets serving the units described above.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Observe stream at headwall during storm events.</li> <li>▪ Track out-of-bank flows and surface flood depths during storm events.</li> </ul>
Water quality improvement	Deposition of debris, sediment and pollutants into the reconnected floodplain along the flood terrace	<ul style="list-style-type: none"> <li>▪ Capture and removal of 15-20 cubic yards of debris annually, providing for sediment placement on flood terrace.</li> </ul>	Debris and sediment removed from flood terrace rather than having debris travel downstream to Petaluma River and toward the Bay.	<ul style="list-style-type: none"> <li>▪ Monitoring plan to reflect regulatory agency permit conditions will be developed and incorporated into the final CEQA document.</li> <li>▪ Water quality sampling prior to commencement of project.</li> <li>▪ Field surveys and sampling following construction and during a 5-year monitoring period.</li> </ul>
Habitat enhancement	Riparian habitat will connect existing corridors to the east for various mammal, bird, reptile, and amphibian species.	Provide 5 acres of enhanced habitat.	Use of the restored site by various species.	<ul style="list-style-type: none"> <li>▪ Monitoring plan will be developed and incorporated into the final CEQA document.</li> <li>▪ Field observations during the 5-year monitoring period.</li> </ul>
Recreational and educational opportunities	Neighborhood will adopt the creek corridor	Surrounding residents participate in stewardship programs	Citizen participation in monitoring, maintenance, and enjoyment of the creek corridor.	Track and record the number of citizens participating in annual maintenance day(s) and other outreach events.

References: See Attachments 3 and 8

**Project 10:** City of Redwood City Bayfront Canal Flood Management and Habitat Restoration Project

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
Improve flood management	Reduction in chronic and widespread flooding in the Bayfront Canal and Atherton Channel neighborhoods	Prevent 250 homes from being flooded	Flood impacts along the Bayfront Canal and Atherton Channel	Track out-of-bank flows and surface flood depths during storm events.
Reduce contaminants from urban runoff to the Bay	Ponds in Ravenswood Complex detain and treat stormwater prior to discharge to the Bay	Treat 62 acre-feet of runoff during 1-yr storm, 106 acre-feet of runoff during 5-yr storm, 182 ac-ft of runoff during 25-yr storm	Improved water quality in the ponds and discharges to the Bay	Periodic water quality sampling
Restore salt water marsh ponds	Provide a source of water to enhance and restore the habitat of the ponds in the Ravenswood complex	Provide 62 acre-feet of stormwater runoff for habitat enhancement of ponds	Diverse type and amount of vegetation and habitat in the ponds	Visual monitoring of the pond habitat

References: See Attachments 3 and 8

**Project 11:** Regional Groundwater Storage and Recovery Project Phase 1A - South Westside Basin, Northern San Mateo County

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
Provide local groundwater storage	Offset groundwater pumping and recharge the aquifer to provide stored water supply for drought conditions	Store 35,000 acre-feet by 2017 for drought supply.	<ul style="list-style-type: none"> <li>▪ Amount of stored water in aquifer</li> <li>▪ Quality of groundwater</li> </ul>	<ul style="list-style-type: none"> <li>▪ Track elevation of groundwater</li> <li>▪ Monitor Water Quality</li> </ul>

References:

- San Francisco Public Utilities Commission. 2012. *South Westside Basin Groundwater Management Plan*. July. Available: <http://sfwater.org/Modules/ShowDocument.aspx?documentid=3104>.

**Project 12: Richmond Breuner Marsh Restoration Project**

<b>Project Goals</b>	<b>Desired Outcomes</b>	<b>Targets</b>	<b>Performance Indicators</b>	<b>Measurement Tools and Methods</b>
Habitat Improvement	Long-term, self-sustaining tidal wetlands, seasonal wetlands, and coastal prairie will create valuable habitat for special status species	Create, restore or enhance approximately 60 acres of wetlands and 90 acres of coastal prairie upland habitat.	<ul style="list-style-type: none"> <li>▪ Increase in presence of marine, intertidal, and upland species.</li> <li>▪ Acres created or restored</li> <li>▪ Vegetation Cover and Type</li> <li>▪ Increased hydrologic capacity/function</li> </ul>	Annual surveys: <ul style="list-style-type: none"> <li>▪ Sediment Stakes</li> <li>▪ Staff Gages</li> <li>▪ Tidal Prism</li> </ul>
Increase Educational and Recreational Opportunities	Public access for compatible, passive recreation and public education.	10,000 visitors per year	<ul style="list-style-type: none"> <li>▪ Public use for recreation</li> <li>▪ Participation in educational events</li> </ul>	<ul style="list-style-type: none"> <li>▪ Track public visitation</li> <li>▪ Track participation in educational events</li> </ul>

References: See Attachments 3 and 8

**Project 13:** Roseview Heights Infrastructure Upgrades for Water Supply and Quality Improvement, Santa Clara County

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
Improve water supply reliability	<ul style="list-style-type: none"> <li>▪ Minimize vulnerability of infrastructure to catastrophes.</li> <li>▪ Maximize water use efficiency.</li> <li>▪ Replace “beyond life expectancy” infrastructure.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Replace unengineered redwood water tanks with seismically engineered bolted steel tanks.</li> <li>▪ Make permanent fixes to tanks to eliminate loss of over 11 AFY due to water leakage.</li> <li>▪ Add water distribution system storage redundancy.</li> <li>▪ Replace 2” galvanized main with 8” HDPE water main.</li> </ul>	<ul style="list-style-type: none"> <li>▪ New non-leaking tanks constructed.</li> <li>▪ Source meter reading (San Jose Water) closely matches meter readings per individual customer usage.</li> <li>▪ Meet system storage redundancy requirements to better enable maintenance.</li> <li>▪ System storage and transmission lines meet current state codes.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Track meter readings monthly at the source</li> <li>▪ Track customer meter reading quarterly</li> <li>▪ Perform annual tank maintenance and valve exercise plans</li> <li>▪ New tanks will be hydrostatically tested, 11 month warranty dive inspection, annual inspections &amp; cleaning to ensure non-leakage.</li> </ul>
Protect public health, safety, and property	<ul style="list-style-type: none"> <li>▪ Provide a cleaner, safer and more reliable drinking water</li> <li>▪ Provide increased fire suppression capability.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Improvement or addition of measureable chlorine residual throughout entire system.</li> <li>▪ Increased water supply.</li> <li>▪ Installation of larger diameter water main for fire flow and additional hydrant.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Water clarity and chlorine residual targets met at the farthest end of the distribution system.</li> <li>▪ New fire hydrant installed and functional.</li> <li>▪ Increased fire suppression protection area achieved.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Standard monthly water testing</li> <li>▪ Test TTHM and HAAS annually</li> <li>▪ Hydrant flow testing</li> </ul>

References: See Attachments 3 and 8

**Project 14:** San Francisco Bay Climate Change Pilot Projects Combining Ecosystem Adaptation, Flood Risk Management and Wastewater Effluent Polishing

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
Improve flood management through wet-weather equalization	<ul style="list-style-type: none"> <li>▪ Develop a facility to provide temporary storage for infrequent peak treated wastewater flows associated with large storm events.</li> <li>▪ Minimize vulnerability of infrastructure to catastrophes (i.e., flooding from sea level rise)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Capacity to store up to 8 million gallons (MG) of secondary treated wastewater for up to 6 hours.</li> <li>▪ Capacity for more frequent peak flows – up to 5 MG of wastewater for up to 6 hours for 3 to 5 events per year.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Equalization facility built.</li> <li>▪ Storage availability/capacity as required.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monitoring plan to be developed as part of the Operations and Maintenance Plan for the facility</li> <li>▪ Sign off by Oro Loma Sanitation District (OLSD) following project completion</li> <li>▪ OLSD report on facility functionality</li> </ul>
Ecosystem Restoration	Creation, protection, enhancement, and maintenance of environmental resources and habitats	A demonstration of how treated wastewater and stormwater may be discharged through seepage habitat levees to restore historical moist grassland/bayland ecotone.	<ul style="list-style-type: none"> <li>▪ Percent cover.</li> <li>▪ Diversity of native upland species.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monitoring plan to be developed as part of the Operations and Maintenance Plan for the facility</li> <li>▪ Vegetation mapping and reporting</li> </ul>
Water Quality	Protection and improvement of the quality of water resources	A demonstration of a wetland to treat a portion of OLSD’s discharge through a variety of configurations with varying soil types, slopes, and vegetation to help ascertain ideal water quality treatment (removal of nutrients and contaminants) and configurations for larger future projects	Proportional improvement in the removal of contaminants and the denitrification of wastewater effluent	<ul style="list-style-type: none"> <li>▪ Monitoring plan to be developed as part of the Operations and Maintenance Plan for the facility</li> <li>▪ Effluent samples from the slope</li> </ul>

Protection of public health, safety and property	Promotion of economic, social, and environmental sustainability	No adverse impacts to existing water quality in East Bay Dischargers Authority (EBDA) pipeline	No change in OLSD output to EBDA line	<ul style="list-style-type: none"> <li>▪ Monitoring plan to be developed as part of the Operations and Maintenance Plan for the facility</li> <li>▪ Effluent sampling pre-EBDA pipeline</li> </ul>
Dissemination of lessons learned from demonstration projects	Inform design of future projects	<ul style="list-style-type: none"> <li>▪ Address specific research questions</li> <li>▪ Incorporate findings from OLSD into future ecotone slope designs</li> <li>▪ Increase acceptance for POTW ecotone slopes</li> </ul>	<ul style="list-style-type: none"> <li>▪ Generation of peer reviewed journal papers</li> <li>▪ Conceptual design of 2 additional pilot projects which incorporate lessons learned from this project</li> <li>▪ Presentation of results to BACWA and other regional entities</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monitoring plan to be developed as part of the Outreach Plan</li> <li>▪ Outreach document in quarterly reports and papers and posted on the website</li> </ul>

References: See Attachments 3 and 8

**Project 15: San Francisco International Airport Reclaimed Water Facility**

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
Improve Water Quality	<ul style="list-style-type: none"> <li>▪ Increase water quality effluent that is being discharged to the Bay.</li> <li>▪ Decrease water quantity that is being discharged to the Bay.</li> </ul>	Upgrade facilities to treat 1.6 MGD of industrial wastewater and first flush storm water to a higher quality by installing state-of-the-art Dissolved Air Flotation and Trickling Filter treatment technologies.	<ul style="list-style-type: none"> <li>▪ Increase in effluent quality entering the Bay, based on several parameters.</li> <li>▪ Percent decrease in quantity of effluent being sent to the Bay.</li> </ul>	RWQCB permit requirements: <ul style="list-style-type: none"> <li>▪ Continued monitoring and reporting of discharge as required by the RWQCB</li> <li>▪ Water testing of various parameters/constituents to show change in overall effluent water quality.</li> <li>▪ Water metering to show reduction in effluent being sent to the bay.</li> </ul>

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
Improve water supply reliability	Reduce water demand on the Hetch Hetchy system by using 100% of treated effluent at the airport terminals for non-potable reuse	Use 100% recycled water for all non-potable water demands, thus offsetting potable water and reducing water demand from the Hetch Hetchy.	<ul style="list-style-type: none"> <li>▪ Percentage decrease in annual potable water use.</li> <li>▪ Percentage increase in annual recycled water use for non-potable purposes.</li> </ul>	RWQCB permit requirements: <ul style="list-style-type: none"> <li>▪ Water metering to show reduction in potable water use.</li> <li>▪ Water metering to show increased amount of recycled water use.</li> </ul>
Protection of public health, safety, and property	Upgrade current aging wastewater infrastructure and reduce/prevent future breaks and violations.	Reduce occurrence of illicit discharges by upgrading IW infrastructure.	An annual reduction in infrastructure breakdowns and violations for the IW treatment plant.	Work order and history logbooks: <ul style="list-style-type: none"> <li>▪ History of work orders to show reduction of infrastructure breakdowns at the treatment plant on annual basis.</li> <li>▪ Discharge log to show a decrease in accidental discharges to the bay.</li> </ul>

References: See Attachments 3 and 8

**Project 16:** San José Green Streets & Alleys Demonstration Projects

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
<p><b>Improve Water Quality</b> Provide bioretention treatment and allow infiltration of untreated stormwater to remove sediment and other pollutants of concern, thus reducing flow and pollutant loads to downstream water bodies.</p>	<ul style="list-style-type: none"> <li>▪ Removal of urban runoff pollutants: sediment, sediment-bound pollutants such as heavy metals, PCBs, and pesticides, and hydrocarbons and oil and grease from motor vehicles.</li> <li>▪ Decrease trash in alleys due to improved conditions allowing the City to sweep regularly.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Reduce impervious surfaces by over 55,000 square feet (1.3 acres) and create up to 32,500 square feet of bioretention rain gardens to treat runoff.</li> <li>▪ Install 5,000 square feet of permeable pavers.</li> <li>▪ Capture and infiltrate 334 lbs of Total Suspended Solids (TSS) per year.</li> <li>▪ Infiltration trenches and dry wells will be designed to capture, store, and infiltrate 80% of the annual runoff from the alleys and tributary areas of adjoining properties</li> </ul>	<ul style="list-style-type: none"> <li>▪ Decrease in Total Suspended Solids (TSS) using the Spreadsheet Method (CPSWQ, Inc).</li> <li>▪ Significant pollutant load reductions.</li> </ul>	<p>Spreadsheet Method (CPSWQ, Inc):</p> <ul style="list-style-type: none"> <li>▪ Track pollutant loads</li> </ul> <p>Bay Friendly certification:</p> <ul style="list-style-type: none"> <li>▪ Maintenance methods</li> </ul> <p>Stormwater Permit requirements:</p> <ul style="list-style-type: none"> <li>▪ Pre- and Post-construction water quality monitoring</li> <li>▪ Final report discussing findings</li> </ul>

References: See Attachments 3 and 8

**Project 17: San Pablo Rheem Creek Wetlands Restoration Project**

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
<p><b>Improve Habitat</b></p> <p>Create and establish seasonal wetland habitat and preserve adjacent upland watershed</p>	<ul style="list-style-type: none"> <li>▪ Establish seasonal wetlands and preserve upland watershed at the San Pablo-Rheem Creek Restoration Site.</li> <li>▪ Meet the regulatory requirements of the SF Corps (USACE) and SFRWQCB permit requirements for the CCWD Shortcut Pipeline Improvement Project.</li> <li>▪ Provide open space (subject to agency approval) and create a creek protection zone adjacent to the larger Breuner Marsh property.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Create and establish up to 4.82 acres of seasonal wetlands on an approximately 10 acre site adjacent to Rheem Creek.</li> <li>▪ Preserve 5.2 acres of upland watershed.</li> <li>▪ Confirm that created seasonal wetlands have been established within 5 years.</li> </ul>	<p>Wetland Soil:</p> <ul style="list-style-type: none"> <li>▪ Soils will seasonally flood, pond and/or saturate for long (&gt;7 days) to very long (&gt;30 days) continuous durations.</li> </ul> <p>Wetland Hydrology:</p> <ul style="list-style-type: none"> <li>▪ The frequency of inundation and/or saturation of the restored wetlands shall be a minimum of 18.25 continuous days per year.</li> </ul> <p>Wetland Vegetation:</p> <ul style="list-style-type: none"> <li>▪ Vegetative cover will consist predominantly of native wetland plant species or other wetland species.</li> <li>▪ By monitoring Year 3, total wetlands vegetation cover shall average <math>\geq 60</math> percent of reference wetlands.</li> <li>▪ By monitoring Year 5, total wetland vegetation cover shall average <math>\geq 70</math> percent of reference wetlands.</li> </ul>	<p>USACE and SFRWQCB Mitigation Monitoring and Reporting Plan (MMRP):</p> <ul style="list-style-type: none"> <li>▪ Annual reports for the first 5 years</li> <li>▪ Reports every 5 years after success criteria are proven for 5 years</li> </ul> <p>Evaluate the amount, character and quality of wetlands:</p> <ul style="list-style-type: none"> <li>▪ Aerial photography</li> <li>▪ Field surveys</li> <li>▪ GIS analysis</li> </ul>

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
Improve Water Quality and Food Management	New seasonal wetlands adjacent to Rheem Creek will accommodate stormwater flows. Water may overtop Rheem Creek during 2-year storm event.	Wetlands will accommodate Rheem Creek overtopping during storm events.	Improved water quality from Rheem Creek into San Pablo Bay.	SFRWQCB and USACE requirements: <ul style="list-style-type: none"> <li>▪ Monitor water quality and flood management</li> <li>▪ Track large storm events in annual reports.</li> </ul>

References:

- USACE and SFRWQCB Mitigation Monitoring and Reporting Plan (MMRP)

**Project 18:** St. Helena Upper York Creek Dam Removal and Ecosystem Restoration Project

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
Improved fish passage and habitat connectivity	Replacement of the barrier to fish passage with a stable, naturally functioning channel that allows aquatic species access to and from the upper York Creek watershed.	Provide upstream passage to 1.7 miles of spawning and rearing habitat for steelhead and habitat connectivity for both anadromous and resident fish and other aquatic and terrestrial species.	Removal of the dam and creation of a stable, naturally functioning channel.	Monitoring of the creek’s geometry will occur in the fall for 3 years to ensure that the reconstructed channel is functioning as designed to allow for fish passage and connectivity and that erosion is not occurring immediately upstream or downstream. As-built dimensions will be compared to current conditions, changes in profile and sections noted, and, if required, contingency measures will be developed for submittal to regulators for approval. Monitoring reports with photos will be submitted annually to regulators for 3 years after project completion.

<p>Remove potential for future downstream habitat degradation and fish kills</p>	<p>Permanent solution to accidental sediment releases.  Permanent solution to potentially catastrophic dam failure.</p>	<p>Remove the dam so that fine sediment does not accumulate behind it, thus eliminating possible downstream sediment releases.</p>	<p>Embankment is removed, and restoration area is stabilized.</p>	<p>Annual monitoring of the creek’s geometry will occur to ensure that sediment build-up is not occurring; see details above.</p>
<p>Habitat restoration</p>	<p>Provide improved aquatic and riparian habitat.  Revegetate previously disturbed area with a palette of multistory, native plants.</p>	<ul style="list-style-type: none"> <li>▪ 2 acres of restored riparian habitat within existing upper dam and reservoir area.</li> <li>▪ 1.7 miles of steelhead stream habitat.</li> <li>▪ Provide opportunity for natural transport of gravel materials downstream.</li> </ul>	<p>Revegetated ecosystem with a diverse palette of multistory, native plants.  Remove dam embankment to allow for sediment transport to improve downstream conditions.</p>	<p>Success will be measured by annual plant survival counts during the 3-year plant establishment period. Revegetation success will be equivalent to or better than native grasses and herbaceous perennials established over a minimum 20% of each planting zone. If after 3 years, success has not been achieved, the City will consult with regulators to develop and implement measures to achieve success. Monitoring reports with photos from permanent stations will be submitted annually to regulators for 3 years after project completion.  The City will implement a channel geomorphic monitoring program to document changes in cross-sectional area on a regular, pre-determined schedule.</p>

References:

- City of St. Helena and U.S. Army Corps of Engineers. 2009. *Administrative Draft Mitigation, Monitoring, and Reporting Plan (MMRP) Upper York Creek Ecosystem Restoration Project*. November.

**Project 19: Students and Teachers Restoring a Watershed (STRAW) Project—North and East Bay Watersheds**

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
<p><b>Improve Habitat</b></p> <p>Protect and restore the health of riparian and wetland ecosystems</p>	<ul style="list-style-type: none"> <li>▪ Increased functioning wetland/riparian habitat.</li> <li>▪ Increase migratory songbird population.</li> <li>▪ Increased native vegetation along streams and wetlands.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Restore a minimum of 15,000 linear feet of wetland/riparian habitat</li> <li>▪ After 5 years, restoration sites will have achieved a riparian bird index (RBI) that rates as “good” or “excellent.”</li> <li>▪ Achieve a minimum of 75% survival rate for planted native vegetation</li> </ul>	<ul style="list-style-type: none"> <li>▪ Linear feet of each project/increased density of native vegetation</li> <li>▪ The RBI uses information about the birds that occur on monitoring plots to rate the plot as “poor,” “fair,” “good,” or “excellent”. These ratings were developed using data collected on bird communities at sites with mature riparian forests (Seavy and Gardali 2009).</li> <li>▪ Planted native vegetation percent survival and vigor.</li> </ul>	<p>Riparian Zone Monitoring Plan (RZMP) (<a href="http://cesonoma.ucanr.edu/files/76316.pdf">http://cesonoma.ucanr.edu/files/76316.pdf</a>):</p> <ul style="list-style-type: none"> <li>▪ On ground measurements/ photomonitoring</li> <li>▪ Area search surveys will be conducted on plots that are 0.5-1.5 hectares in area. The area search method is an effective, simple, and efficient means of collecting information about the diversity and abundance of birds (Ralph et al. 1993).</li> <li>▪ Monitor plant survival rate and vigor by species</li> </ul>
<p><b>Improve Water Quality</b></p> <p>Protect and restore the health of riparian and wetland ecosystems through natural stormwater treatment</p>	<ul style="list-style-type: none"> <li>▪ Provide natural filtration for Stormwater runoff</li> <li>▪ Reduce sedimentation, increase nutrient and metals uptake, and lower water temperatures</li> </ul>	<p>Restoration of 15,000 linear feet of stream with approximately 0.5 cfs flow will provide the treatment equivalent of a stormwater treatment plant designed to treat 1.2 million gallons of runoff per day.</p>	<p>Achieve a minimum of 75% survival rate for planted native vegetation. Thriving native vegetation will provide Stormwater treatment functions.</p>	<p>Riparian Zone Monitoring Plan (RZMP) methods:</p> <ul style="list-style-type: none"> <li>▪ Monitor plant survival rate and vigor by species</li> </ul>

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
<p><b>Increase Educational Opportunities</b></p> <p>Improve the environmental knowledge, skills, and attitudes of community members who participate in the STRAW program</p>	<p>Increase environmental awareness throughout the North, East, and West Bay Area regions through a community focused education program.</p>	<ul style="list-style-type: none"> <li>▪ 3,500 volunteers annually.</li> <li>▪ 80% increase of participants’ environmental knowledge, skills and attitudes through STRAW workshops, classroom activities and restoration projects.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Number of people participating in various STRAW activities.</li> <li>▪ Percent of participants who indicate a positive change in their environmental knowledge, skills and attitudes after participation in a STRAW activity.</li> </ul>	<p>PRBO Science Education Evaluation Methodology:</p> <ul style="list-style-type: none"> <li>▪ Track number of participants that participate in STRAW activities.</li> <li>▪ Survey a subset of participants through written and on-site assessments.</li> </ul>

## References:

- Lennox, M., N. Scolari, and D. Lewis. 2010. *Riparian Zone Monitoring Plan (RZMP)*. Prepared by University of California Cooperative Extension for Marin Resource Conservation District, Point Reyes Station CA. 75 p. <http://cesonoma.ucanr.edu/files/76316.pdf>.
- PRBO Science Education Evaluation Methodology, supported and approved by Marin Community Foundation Evaluation Resources.
- Ralph, C.J., G.R. Geupel, P. Pyle, T.E. Martin and D.F. DeSante. 1993. *Handbook of field methods for monitoring landbirds*. USDA Forest Service General Technical Report PSW-GTR-144.
- Seavy, N. E., and T. Gardali. 2012. “Developing a riparian bird index to communicate restoration success in Marin County, California.” *Ecological Restoration* 30:157-160.
- State Water Resources Control Board. 2001. Standard Operating Procedure (SOP) 4.2.1.4. Stream Photo Documentation Procedure.
- **Note:** Bird monitoring plots will be established on a representative subset (~ 25% of all restoration sites). Plots will be surveyed at two points in time: once before or immediately following restoration, (depending on individual project constraints/logistics) and once either 2 or 3 years after restoration. Surveys will be twice during the months of May and June. For each survey, the Riparian Bird Index will be calculated following Seavy and Gardali (2009) and the average of the two visits will be used at the performance measure for that time period.