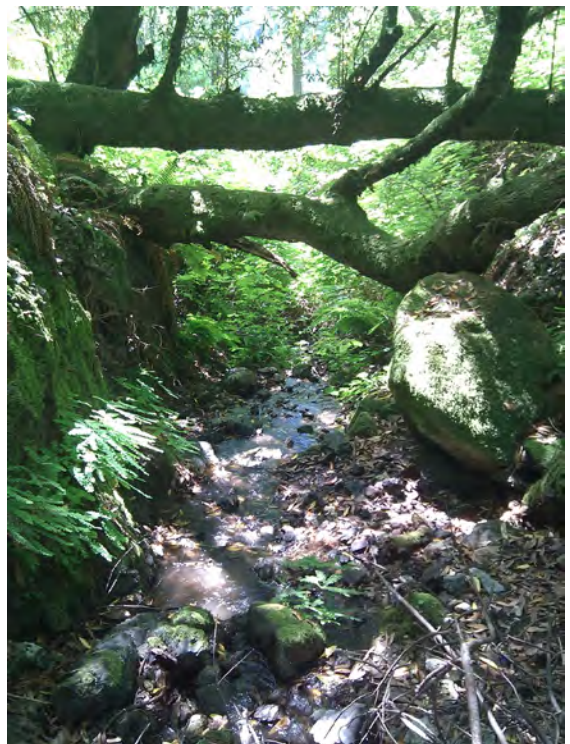
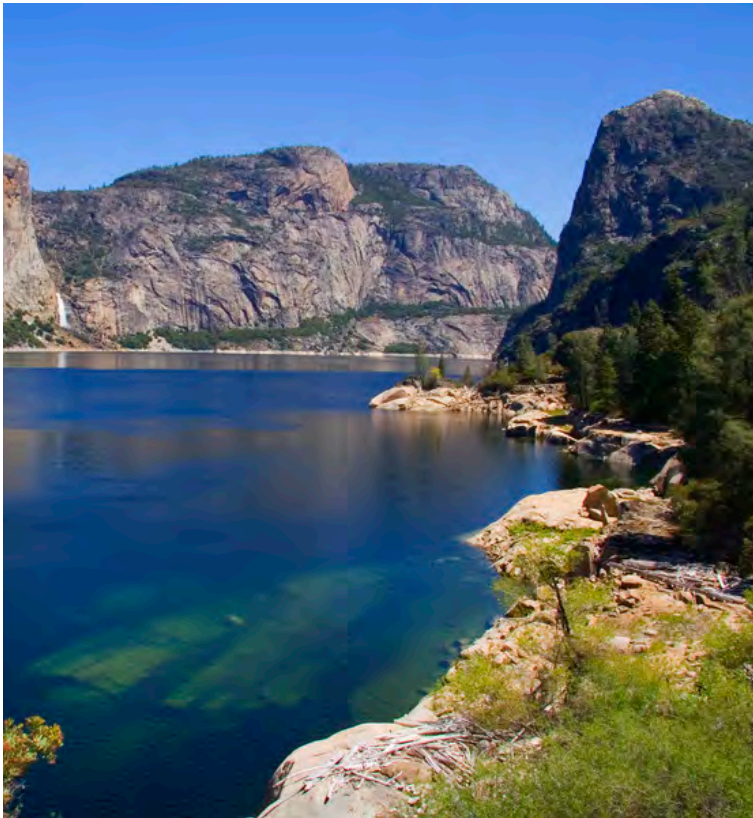


February 2016

SAN FRANCISCO PUBLIC UTILITIES COMMISSION

Watershed and Environmental Improvement Program

10 Year Report | FY 2006 – 2015





O'Shaughnessy Dam and Upper Tuolumne River

On the cover:

Hetch Hetchy Reservoir

Stock Pond, Alameda Watershed

Pilarcitos Creek, Peninsula Watershed

Sisyrinchium bellum, blue eyed grass

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Introduction

The San Francisco Public Utilities Commission's Natural Resources and Lands Management Division (NRLMD) is responsible for the management of 63,000 acres of watershed lands and 210 miles of right-of-way. Located in three counties, these lands contain the water storage, transmission, and treatment systems which serve 2.6 million people. NRLMD is also responsible for monitoring, protecting, and restoring those lands and ecological resources under the management of the SFPUC. The goal of the Watershed and Environmental Improvement Program (WEIP), a program directed by the NRLMD, is to proactively manage, protect, and restore environmental resources that affect or are affected by the operation of the SFPUC water system. Annual reports are developed for public review and discussion. This report describes the background and purpose of the WEIP, highlights accomplishments during the first 10 years of implementation (FY 05/06 to FY 14/15), and outlines future priorities.

Looking forward, investments to increase public education and recreation opportunities in the Peninsula and Alameda Watersheds are expected to result in significant improvements in the next few years. On the Peninsula Watershed, the Water Enterprise has been working to close gaps in the two existing regional trails that run north/south – the Crystal Springs Regional Trail, operated and maintained by San Mateo County Parks – and the Bay Area Ridge Trail. Important connectors that link these two regional trails and other public lands adjacent to the watershed are also being developed. On the Alameda Watershed, the NRLMD has been working closely with the East Bay Regional Park District and Alameda County on a feasibility study to identify a viable alignment through Niles Canyon for a public trail to link adjacent public lands. This feasibility study also includes selecting a proposed route to link the planned Alameda Creek Watershed Center to the nearby Vargas Plateau Regional Park, soon to be opened by EBRPD. The SFPUC has also focused on working with other partners to fund the purchase of conservation easements in the upper Alameda Watershed.

Background and Purpose

The SFPUC initiated the WEIP in FY 05/06, but the origins of the program go back further in time. When the San Francisco voters approved Measure A on November 5, 2002, it included the following language: "...improvements' shall mean improvements that will restore, rehabilitate and enhance the ability of the Public Utilities Commission to deliver water to users of the City's water system, such improvements to include, but are not limited to water delivery, seismic improvements, water quality improvements, water supply improvements, and *watershed and environmental improvements...*"(emphasis added)

During public workshops focused on Water System Improvement Program (WSIP) level of service objectives in 2005, the Bay Area Water Stewards (BAWS), including the Tuolumne River Trust, Alameda Creek Alliance, Clean Water Action, Bay Area Water Supply and Conservation Agency, and the Sierra Club suggested that some of the WSIP bond funds be set aside to implement projects as described in Measure A, and that these investments be in addition to ongoing watershed work, and in addition to required mitigation funds associated with WSIP projects. This discussion culminated in the description of the WEIP included in the WSIP adopted by the Commission on November 29, 2005. At that meeting, the Commission stated its intent to provide \$50 million over the following 10 years for the SFPUC to proactively manage, protect, and restore environmental resources that affect or are affected by the operation of the SFPUC water system, and that \$20 million of this total would be provided from WSIP Measure A bond funds. The additional \$30 million was directed to come from the Water Enterprise

operating budget. Since then, SFPUC staff have met regularly with BAWs and provided annual updates to the Commission to account for progress during WEIP implementation.

The commitment of \$50 million to meet WEIP objectives is a considerable investment to improve management of natural resources that affect or are affected by operation of the SFPUC water system. It is clear that more than 10 years will be required to spend all of the funds. The NRLMD anticipates that WEIP expenditures will reach about \$28 million in the first 10 years. At the current rate of spending it will take an additional 5 - 7 years to reach the \$50 million investment target. However, with several trail projects and land acquisitions in the works it is likely that the funds will be spent more quickly.



Alameda Creek

As a public water utility, and manager of 60,000 acres of land, the SFPUC has a vested interest in protecting, maintaining, and restoring natural resources - particularly species listed under federal or state law as threatened or endangered - in order to minimize regulatory risk that could affect the SFPUC's ability to meet water supply reliability level of service objectives. The Water Enterprise Environmental Stewardship Policy (Stewardship Policy), adopted by the Commission on June 27, 2006, provides broad guidance to minimize this risk, and the WEIP is an important long-term, landscape-level, ecosystem-based, and cost-effective strategy to assist in meeting the objectives of the Stewardship Policy.

The NRLMD is working to develop specific performance measures to better track the return on previous and future WEIP investments, in addition to tracking the expenditure of funds. The performance measures will be linked to new or modified level of service objectives for sustainability, which are under development by the Water Enterprise.

Goal and Objectives

Goal and objectives for the WEIP were developed in coordination with the Bay Area Water Stewards.

The goal of the WEIP is to protect and restore lands and natural resources that affect or are affected by the operation of the SFPUC water system.

The WEIP objectives include:

- Manage watershed activities and resources to protect source water quality and protect/restore terrestrial and aquatic species and their habitats.
- Protect/restore watershed lands.
- Enhance public awareness of watershed resources, their protection and restoration efforts.
- Maintain up-to-date watershed management plans.
- Foster SFPUC's leadership role in environmental stewardship through collaboration and partnerships with other agencies, input from the scientific community, and public participation.
- Make use of all available science in planning, design and implementation, and include criteria and monitoring to evaluate and report outcomes.
- Distribute funds so that the overall portfolio affords protection across landscapes and ecological targets in the primary watershed regions.
- Develop monitoring and feedback mechanisms to measure progress against performance measures.

The goal and objectives are posted on the SFPUC website at: sfwater.org/WEIP.

The WEIP includes the comprehensive identification of critical watershed lands and ecosystem restoration needs within the hydrologic boundaries of the Alameda Creek, Peninsula (San Mateo and Pilarcitos Creeks) and Tuolumne River watersheds.

The highest priority for the WEIP is to permanently protect watershed lands through the purchase of conservation easements and/or fee title from willing landowners of property that drains directly into SFPUC reservoirs.



Poopenaut Valley

Priorities by Watershed

Upper Tuolumne River (O'Shaughnessy Dam to Don Pedro Reservoir)

- Fund collaborative studies and monitoring partnerships as part of the Upper Tuolumne River Ecosystem Program
- Support of public outreach and education programs

Lower Tuolumne River (downstream of Don Pedro Reservoir)

- Protection of low lying floodplain areas through permanent conservation easements and/or fee title purchase of the property from willing landowners

Alameda Creek Watershed

- Watershed protection through purchase of permanent conservation easements and/or fee title purchase of property from willing landowners with property that drains into SFPUC reservoirs
- Support of public outreach and education programs
- Habitat restoration focused on native aquatic and terrestrial species

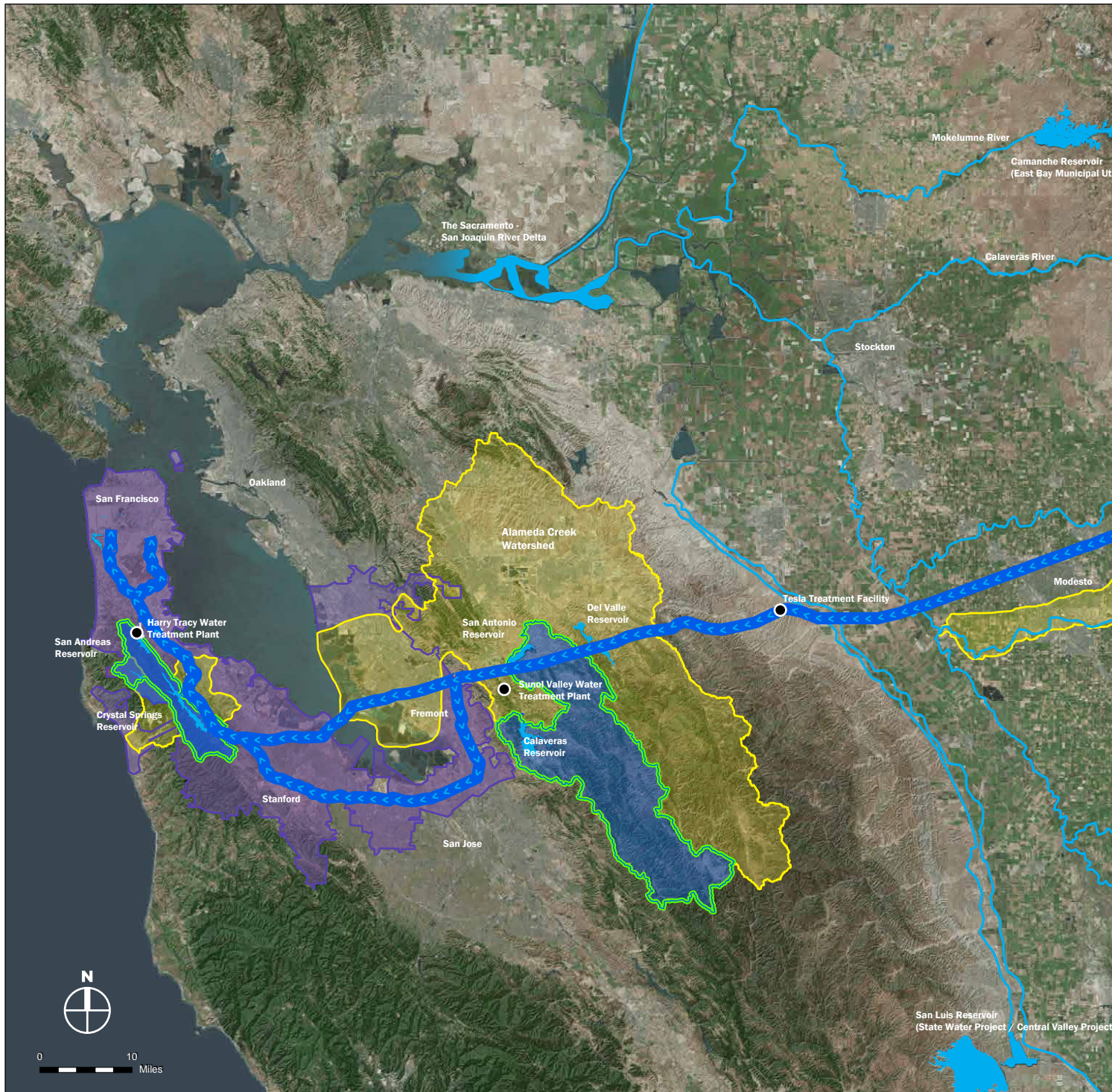
Peninsula Watershed

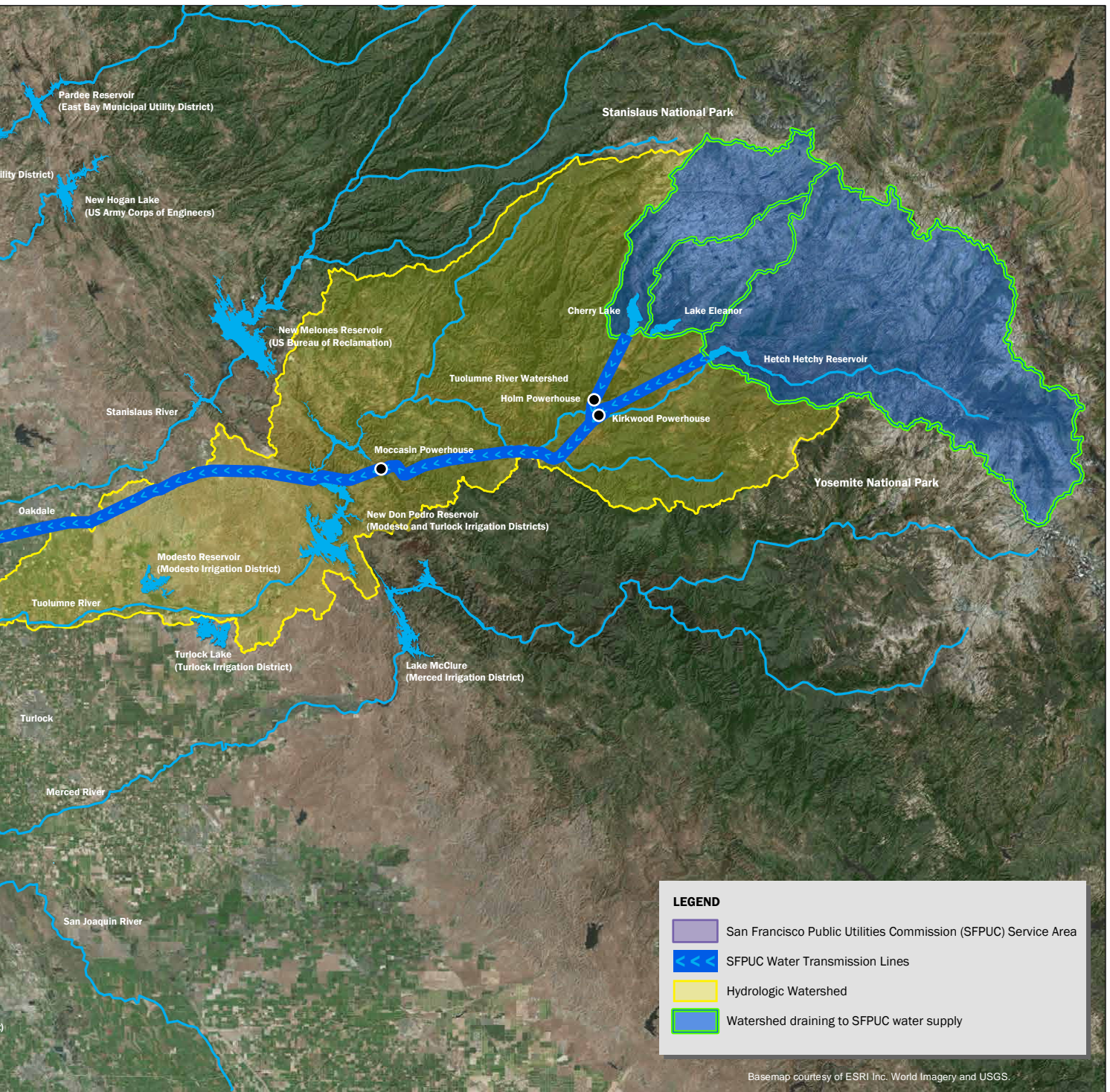
- Watershed protection through purchase of permanent conservation easements and/or fee title purchase of property from willing landowners with property that drains into SFPUC reservoirs
- Support of public outreach and education programs
- Habitat restoration focused on native aquatic and terrestrial species
- Protection of low lying floodplain areas in the Pilarcitos watershed through permanent conservation easements and/or fee title purchase of the property from willing landowners

San Francisco Lands

The SFPUC owns a number of properties in the City and County of San Francisco, including Lake Merced, Twin Peaks and Laguna Honda. These properties have unique habitats and conservation challenges. The SFPUC is working with the San Francisco Recreation and Parks Department and other interested parties to identify specific objectives for managing these properties and to proactively manage these sites to protect natural resources.

Hetch Hetchy Regional Water System, Service Area, Watersheds





Overview of Accomplishments – The First 10 Years (FY05/06 – FY 14/15)

Upper Tuolumne River

The Upper Tuolumne River Ecosystem Program

Subsequent to adoption of the Stewardship Policy, the SFPUC initiated the Upper Tuolumne River Ecosystem Program (UTREP) with the goal of conducting a set of long-term, collaborative, science-based investigations designed to:

- Characterize historical and current river ecosystem conditions downstream of major Hetch Hetchy Project facilities within the Upper Tuolumne River watershed;
- Assess the relationship between the historical and current river conditions and Hetch Hetchy Project operations; and
- Develop new instream flow release schedules and other recommendations for improving ecosystem conditions.



Hetch Hetchy Reservoir

The study area includes reaches of the Upper Tuolumne River mainstem and major tributaries regulated by the Hetch Hetchy Project, from O’Shaughnessy Dam to Don Pedro Reservoir, Cherry Creek downstream of Cherry Dam, and Eleanor Creek downstream of Eleanor Dam. Primary partner agencies include Yosemite National Park (NPS), Stanislaus National Forest (USFS), and the U.S. Fish and Wildlife Service (USFWS). The SFPUC and partner agencies meet regularly with the Upper Tuolumne River Stakeholder Group to provide updates and receive input from participants.

The WEIP supports the SFPUC’s UTREP effort, which contributes to both SFPUC and NPS natural resource management interests. Over the past 10 years, numerous studies and planning efforts have been undertaken, including the development of the O’Shaughnessy Dam Instream Flow Management Plan, which is designed to improve upon existing instream flow releases from O’Shaughnessy Dam by better mimicking natural snowmelt hydrology to more broadly support the Upper Tuolumne River ecosystem.

Beginning in 2006, the SFPUC conducted an initial phase of studies to describe ecological conditions downstream of major SFPUC Hetch Hetchy Project facilities, identify key information gaps, and provide recommendations for short- and long-term UTREP activities. Based on this initial work and guided by SFPUC, NPS, and USFWS priorities, a second phase of studies began in 2007 in collaboration with NPS, USFWS, USFS, and others, focusing on resources in the reach of the Tuolumne River bypassed by Canyon Power Tunnel, between O’Shaughnessy Dam and Kirkwood Powerhouse.

Work conducted in this second phase represents a broad and comprehensive set of collaborative studies, including sediment transport studies, flow/habitat mapping studies, water temperature modeling, foothill yellow-legged frog recruitment modeling, and hydraulic modeling of the Poopenaut Valley. NPS continues to lead two important efforts: (1) the Looking Downstream Project, which studies relationships between O’Shaughnessy Dam releases and wetland health in the unique Poopenaut Valley area downstream of the dam, and (2) the Amphibian and Reptile Survey Project, which helps improve understanding of the role O’Shaughnessy Dam releases play in maintaining amphibian and reptile populations.

In April 2014, the SFPUC completed and released a public draft of the O’Shaughnessy Dam Instream Flow Management Plan. The draft plan was presented to the Upper Tuolumne River Stakeholder Group and is being technically reviewed by partner agencies. Initial coordination for environmental review of the plan is also underway.

While near-term UTREP efforts will primarily focus on finalizing and implementing the O’Shaughnessy Dam Instream Flow Management Plan, existing monitoring efforts will continue. The SFPUC will also continue to conduct WEIP-supported large woody debris and sedimentation studies initiated in 2014 to assist in detecting the proximal effects of the Rim Fire on physical aquatic habitats in the Tuolumne River. The Rim Fire burned approximately 257,000 acres (401 square miles) in the Stanislaus National Forest and Yosemite National Park in late 2013, and burned through the entire UTREP study area to varying degrees.

For more information on UTREP and the draft O’Shaughnessy Dam Instream Flow Management Plan, related reports, and stakeholder meeting materials, visit UTREP online at <http://utrep.blogspot.com>. You can follow UTREP on Twitter @UTREP.

The Economic Impact of the 2013 Rim Fire on Natural Lands

In 2013, the SFPUC worked closely with Pacific Northwest Watershed Managers and the Watershed Economics Workgroup to develop and support new methods of valuing watersheds and the ecosystem benefits (or services) they provide. The members of these groups are public drinking water utilities that rely on the protection of large watersheds to deliver high-quality water to their customers, and include New York, Portland, Seattle, Tacoma, Vancouver, and Victoria. These efforts provide support to federal, state, and local governments in justifying more robust, long-term investments in watershed protection and restoration.



Tuolumne River post Rim Fire

The Rim Fire resulted in traditional economic losses to the communities directly and indirectly affected, and the SFPUC worked with other departments in the City and County of San Francisco, Tuolumne County, and Mariposa County to assist the State in its request for federal assistance to aid in recovery efforts. In support of this, the SFPUC funded Earth Economics (www.eartheconomics.org) to develop a preliminary assessment of the economic impact of the Rim Fire. The assessment includes economic loss estimates related to air quality, carbon sequestration, moderation of extreme events, soil retention, biological control, water regulation, pollination, habitat and biodiversity, property and aesthetic values, and recreational values. The preliminary assessment is available on the Earth Economics website.

Lower Tuolumne River

Dos Rios Ranch Acquisition

On September 28, 2010 the Commission approved a Funding Agreement with River Partners to provide \$2,000,000 for acquisition of the Dos Rios Ranch. The Dos Rios Ranch is located at the confluence of the Tuolumne and San Joaquin Rivers in Stanislaus County, near the San Joaquin River National Wildlife Refuge. The acquisition of Dos Rios Ranch resulted in permanent land conservation and habitat preservation of 1,603 acres and 6 miles of river frontage. In April 2011, The Dos Rios Ranch acquisition was finalized. A celebration was held with the 9 project funding partners and many supporters on May 21, 2012.



Dos Rios Ranch

Alameda Watershed

Calaveras Reservoir and San Antonio Reservoir Hypolimnetic Oxygenation

System (HOS) - HOS facilities have been installed in Calaveras and San Antonio reservoirs.

The installation of these systems has improved the water quality conditions in the reservoirs by increasing the oxygen concentration in the deepest part of the reservoirs, thus limiting nutrient release from the sediments to the water column. The operation of the HOS facilities reduces algal blooms and the unpleasant taste and odors associated with these events, and reduces the need to apply algicides to the reservoirs. The increased oxygen concentration also maintains the cold-water habitat in the reservoirs for the landlocked rainbow trout populations.

Alameda Creek Fisheries Restoration Workgroup - In April 2006, the SFPUC entered into a MOU with members of the Workgroup to initiate flow studies focused on the restoration of steelhead to Alameda Creek. These flow studies were conducted to develop flow recommendations that addressed state and federal regulatory requirements and support restoration of steelhead to the watershed. This effort contributed to the instream flow schedule developed for the Calaveras Dam Replacement Project, as well as provided an important part of the foundation for the SFPUC Alameda Watershed Habitat Conservation Plan which is under development. The MOU was amended on October 20, 2013 and the SFPUC will continue to work with the Workgroup to jointly fund studies under the MOU.

Niles and Sunol Dam Removal - In September 2006, the SFPUC completed the removal of the Niles and Sunol Dams. The removal of the dams eliminated two potential barriers to steelhead migration in Alameda Creek, and is an important component of the steelhead restoration effort in the Alameda Creek Watershed.

Arroyo de la Laguna Restoration - In Fall 2006, the SFPUC partnered with the Natural Resources Conservation Service (NRCS), the Alameda County Resource Conservation District (ACRCD), Alameda County, Zone 7 Water Agency and the Alameda County Water District to

implement a demonstration streambank stabilization project along a 1,000-foot section of the Arroyo de la Laguna between Pleasanton and Sunol, a half-mile south of the Verona Road Bridge. The project was designed to reduce erosion, establish native vegetation, and improve riparian habitat.

Sunol AgPark - In January 2007, the Commission approved a lease to allow Sustainable Agriculture Education (SAGE) to farm 18 acres of prime agricultural land adjacent to the Sunol Temple. The AgPark is a unique urban edge farm that integrates sustainable agriculture, natural resource stewardship, as well as public education which focuses on the agricultural, natural, and cultural resources of the Sunol Valley. SAGE developed a management plan for the AgPark and sub-leased the 18 acres to organic farming partners. SAGE developed and implements the “Farming in the Watershed” 4th - 8th grade curriculum, a program which focuses on the agricultural, natural, and cultural resources of the Sunol Valley. The SFPUC has provided funding to develop and implement the “Farming in the Watershed” education program, as well as the construction of an outdoor structure that provides protection from the elements, making educational programs possible year-round in all weather conditions.



Sunol AgPark

Over 7,200 students have participated in AgPark related programs and nearly 6,000 community members have participated in workshops, workdays and special events at the AgPark. The SFPUC will continue to support the operation of the AgPark and coordinate education programs with the new Alameda Creek Watershed Center, which will be completed in the early 2019.

Alameda Watershed Weed Survey - In Summer 2008, the SFPUC completed weed surveys on the Alameda Watershed. An exploratory inventory was conducted to search as many acres as possible in the least amount of time, while still providing basic information needed to guide the initial development and implementation of a sound non-indigenous plant species (NIPS) management strategy. A total of 2,269 occurrences of 48 NIPS were mapped in the Alameda Watershed comprising 472 acres of total infested area. This information will inform WSIP mitigation planning and development of the SFPUC Alameda Watershed Habitat Conservation Plan. Additional surveys may be conducted in the future.

Alameda Watershed Protection Project - On December 9, 2008, the SFPUC entered into a MOU with ACRCO to implement watershed protection projects in the upper Alameda Creek watershed. Over the course of the MOU and a subsequent amendment, the SFPUC has continued to work with the ACRCO to inform private landowners in the upper Alameda Creek Watershed about conservation opportunities. The highest priority for WEIP continues to be protecting natural resources and water quality in the Alameda Creek Watershed, including the upper Alameda Creek, Arroyo Hondo, and San Antonio watersheds. The SFPUC is partnering with the ACRCO and the USDA NRCS to work with willing landowners to meet these objectives by purchasing conservation easements and/or fee title from willing landowners. As a result of this work, the SFPUC purchased the Olds property on January 24, 2012, an approximately 259 acre parcel in the Alameda Watershed that drains to San Antonio Reservoir. The acquisition of the property not only helped protect water quality, but it also has the potential to provide excellent habitat for the endangered California Tiger Salamander.

Alameda Watershed Rare Plant Survey - In Fall 2009, SFPUC conducted a rare plant survey of the SFPUC’s property within the Alameda Watershed. The survey identified and located sensitive botanical resources including special-status plant species and locally rare plant species within the Alameda Watershed. This baseline information will be used to inform future land



Upper Alameda Creek Watershed

management decisions, including long-term monitoring and stewardship of the Alameda Watershed's rare plant populations. A second survey was conducted in 2011 to look for any plant species that bloom in early spring which were missed during the first survey. At least 2 additional significant species were found in the second survey. Additional surveys may be conducted in the future.

Alameda Watershed Rangeland Monitoring - In Fall 2009, the SFPUC completed plant species composition monitoring on grazed rangelands within the SFPUC's Alameda Watershed. Plant species composition monitoring is a component of SFPUC's Rangeland Monitoring Program developed in 2007. The Rangeland Monitoring Program for grazed rangelands in the SFPUC lands was developed to ensure that the specified rangeland uses are in compliance with any applicable land use regulations and any land stewardship goals, objectives, and implementing guidelines. Monitoring results will be used as a guideline for adaptive management by the SFPUC within the designated grazing areas.

Niles Gage Weir Assessment - The Niles Gage Weir, an integral structure supporting the longest running streamflow gage in the Bay Area, is in a state of disrepair. To support development of long-term options, the SFPUC conducted an assessment of the weir in 2009. The SFPUC continues to survey the structure regularly to determine if degradation of the weir continues. The SFPUC also funds the USGS to operate and maintain an auxiliary gage to duplicate and eventually replace the weir and gage at this location in coordination with the Alameda County Water District. The weir is considered by some groups to be a potential barrier for adult steelhead migration upstream, but radio-tag monitoring has confirmed that adults are able to pass through the weir to upstream habitats. The weir is not considered to be a migration barrier by the California Department of Fish and Wildlife (CDFW) or National Marine Fisheries Service (NMFS) at most flows. Due to low rainfall, and corresponding low flows, during FY13/14 and FY14/15 no survey was conducted. A survey will be conducted in FY14/15.

Arroyo de la Laguna at Verona Bridge Restoration - In Summer 2011, the SFPUC partnered with the USDA NRCS, the ACRCDC, and Alameda County, to implement a second demonstration streambank stabilization project along the Arroyo de la Laguna; this time a

1,000-foot section just downstream of the Verona Road Bridge. The project was designed to reduce erosion, establish native vegetation, and improve riparian habitat. The project consisted of the installation of various bio-engineering structures on SFPUC land in the bed and bank of the Arroyo de la Laguna, where the stream bank is heavily incised. The Project demonstrated the use of economical, environmentally and socially acceptable stream restoration techniques and will benefit habitats for sensitive species such as the western pond turtle and migratory birds in the long term. This project is part of a broader effort to restore the Alameda Creek Watershed.

Upper Alameda Creek Watershed Partnership - On July 12, 2011, the SFPUC approved a MOU with the ACRC, the USDA NRCS, The Nature Conservancy, and the California Rangeland Trust to establish the Upper Alameda Creek Watershed Partnership. The goal of the partnership is to coordinate watershed protection projects in the Mount Hamilton area of the Diablo Range, including the upper Alameda Creek Watershed. This MOU has allowed the SFPUC to better coordinate watershed protection efforts in the upper Alameda Creek Watershed with other organizations that share the common goal of long term protection of this valuable natural resource through conservation easements and fee title acquisitions. This area supports important natural resources including significant native fish, plants and animal populations, and supplies source water to the SFPUC's Calaveras and San Antonio Reservoirs downstream. This MOU has helped the partners present a unified and cohesive vision to landowners and provide them with a clear understanding of land protection options in the watershed. The Partnership has also helped to facilitate discussions with potential funders in order to leverage existing funds.



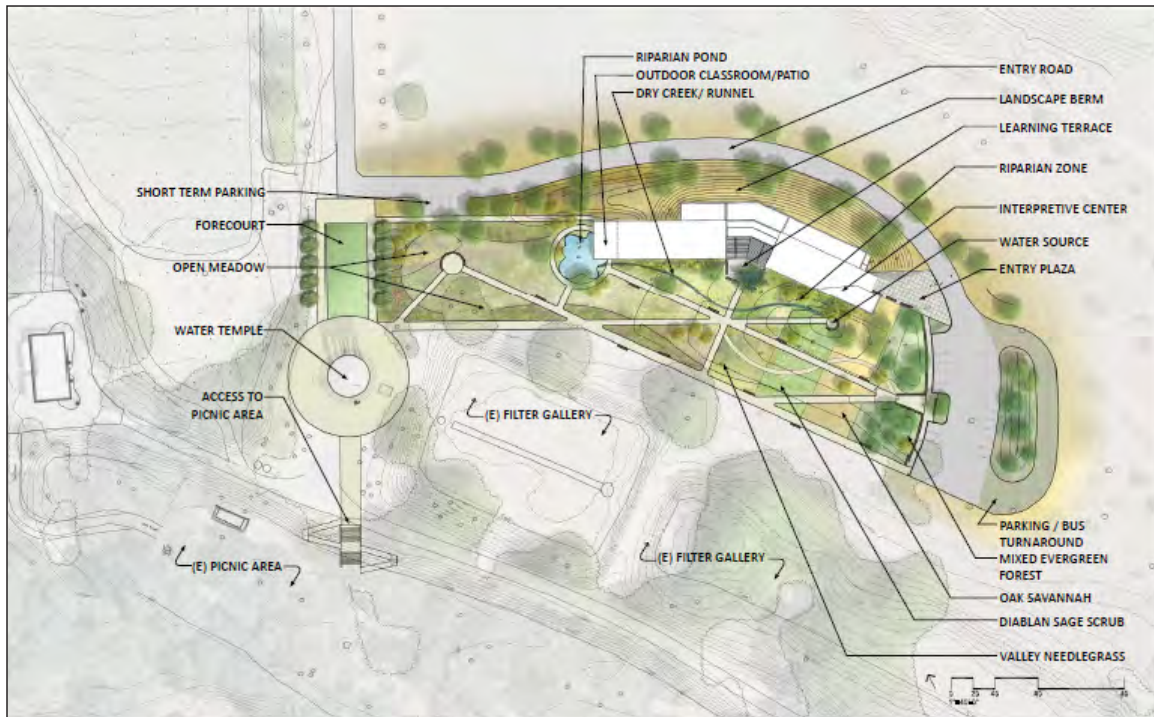
Nolan Ranch – Upper Alameda Watershed

The SFPUC, along with The Nature Conservancy and Santa Clara County, participated in the acquisition of the Nolan Ranch, a 1,157 acre parcel of prime habitat in the Mt. Hamilton Range. On May 22, 2012, the SFPUC approved funding toward the acquisition of the ranch and an endowment to fund the monitoring of the conservation easement. The acquisition protects the land from future development through a conservation easement and paves the way for future plans to open up the property to public recreation while protecting water quality.

Several of the partners are currently working together on a watershed protection project that would permanently protect nearly 12,000 acres of land in the upper Alameda Watershed. It is anticipated that this agreement will be finalized in 2016.

Alameda Creek Historical Ecology Study - In partnership with the Alameda County Flood Control and Water Conservation District, the SFPUC funded the Alameda Creek Watershed Historical Ecology Study by the San Francisco Estuary Institute to inform watershed improvements throughout the Alameda Creek watershed. The goal of the study is to develop an understanding of the historical extent and function of terrestrial, fluvial, riparian, and wetland resources in the Alameda Creek watershed. The final report was completed in February 2013 and the results reveal what the watershed looked like and how it functioned before extensive development. The report will provide valuable information for many public agencies and community groups working in the Alameda Creek watershed. The SFPUC will use information from the report to develop interactive educational media for the Alameda Creek Watershed Center and to inform the development of the Sunol Valley Restoration Report (Report). The Report, led by the SFPUC, will create the comprehensive technical foundation for the integration of restoration actions to be considered by all groups working in this important reach of Alameda Creek.

Alameda Creek Watershed Center - The SFPUC began planning the Alameda Creek Watershed Center in 2010 as part of the Sunol Yard Long Term Improvements Project, which also includes upgrading existing Water Enterprise operations and maintenance facilities in the Sunol Yard. Since May 2011, SFPUC staff has met regularly with stakeholders to discuss the project and get input from the community and interested organizations. The Center will include an interpretive exhibit hall, watershed discovery lab to support public education programs, a community gathering space, staff office space, and a watershed discovery garden and trail. An Interpretive Master Plan was completed in February 2014, and Phase 1 of the schematic design for the interpretive displays was finalized in June 2014. Final design for the facilities and grounds are expected to be completed in February 2016. Construction is scheduled to begin August 2016 and will be completed in early 2019.



Site Plan Alameda Creek Watershed Center

Niles Canyon Trail Feasibility Study - The SFPUC is partnering with East Bay Regional Park District, Alameda County Public Works Agency, and the Alameda County Water District to conduct a feasibility and preliminary engineering study for two proposed EBRPD trail segments traversing Niles Canyon in Alameda County. These trails will provide important transportation and recreational amenities for the community. The goal of the project is to develop a preliminary design and identify environmental and right of way issues for both a paved, non-motorized trail through Niles Canyon from Mission Blvd. to the town of Sunol and an unpaved recreation trail along the ridgeline connecting Vargas Plateau Regional Park with the proposed Alameda Creek Watershed Center. The EBRPD is the lead on planning for these regional trails and the studies were completed in December 2015.

Peninsula Watershed

Peninsula Watershed Weed Survey - In Summer 2008, the SFPUC completed weed surveys on the Peninsula Watershed. An exploratory inventory was conducted to search as many acres as possible in the least amount of time, while still providing basic information needed to guide the initial development and implementation of a sound non-indigenous plant species (NIPS) management strategy. A total of 3,710 occurrences of 65 NIPS were mapped in the Peninsula Watershed comprising 183 acres of total infested area. Additional surveys may be conducted in the future.

Forest Management Research Partnership (formerly the Sudden Oak Death Adaptive Management Project) - The forests within the Peninsula watershed lands are visibly impacted by non-native *Phytophthora* species, which are often spread through the plant nursery trade. *Phytophthora*, meaning “plant destroyer”, is a genus of fungal-like water molds that can affect several native plant species. Through an agreement with the US Forest Service, SFPUC is supporting a collaboration between UC Berkeley and other local experts to monitor the presence and movement of *Phytophthora* on Peninsula watershed lands and to develop strategies for managing these species.

One *Phytophthora* species that has been found to occur on the Peninsula watershed lands is *P. ramorum*, the pathogen that causes Sudden Oak Death (SOD). SOD can kill several species of native California oaks common to the Peninsula watershed, and roughly one-third of the Peninsula watershed is vulnerable to SOD. The research conducted on the Peninsula watershed lands has helped scientists better understand how *P. ramorum* spreads. Its spores are produced during wet, rainy weather in the winter and spring, and while the disease cannot spread from one oak to another, spores splash from California bay trees onto nearby oak trees during spring rainstorms. By removing a few of the bay trees from some of the coast live oak forests within the Peninsula watershed, the SFPUC has been able to distance *P. ramorum* from the oaks, protecting them from SOD and maintaining the important ecological values they provide.

Other *Phytophthora* species that have been found to occur on the Peninsula watershed lands include *P. cinnamomi*, *P. cambivora*, and *P. cactorum*. These species cause root-rots that can kill several tree species, and *P. cinnamomi* and *P. cambivora* have been identified causing mortality in native manzanita species, Pacific madrone, and giant chinquapin in locations around the Bay Area and northern California. Because spores of these species spread through soil, the SFPUC has taken steps to avoid transferring soil from affected sites to new sites. These steps include improving drainage, minimizing road use, and re-surfacing roads within these areas. The SFPUC is also working with other land managers and local experts to research potential eradication methods such as solarization, compost application, and treatment.

Working to Save Our Oaks

Behind this fence is one of many San Francisco Public Utilities Commission (SFPUC) projects designed to protect the natural resources of the Peninsula watersheds.

What is wrong?

The trees along this creek are threatened by sudden oak death, a disease that kills several species of native California oak trees. Sudden oak death is caused by a non-native water mold called *Phytophthora ramorum*.

Although *P. ramorum* does not kill California bay trees, it produces infectious spores on their leaves. The spores can splash from infected bay leaves onto oak trees during rainstorms. Once on an oak tree, *P. ramorum* invades and kills the bark tissue of the oak, eventually killing the entire tree. Keeping spore-covered bay leaves away from oaks can prevent oaks from being infected by *P. ramorum*. Infected oak trees cannot spread *P. ramorum* to one another.

For more information on Sudden Oak Death, including best management practices, visit www.suddenoakdeath.org.



How is the SFPUC working on this issue?

The San Francisco Public Utilities Commission (SFPUC) manages the forest at this location by limiting the growth of bay trees near mature coast live oaks. This keeps the source of deadly *P. ramorum* away from the oaks. We are carefully monitoring for signs of infection.

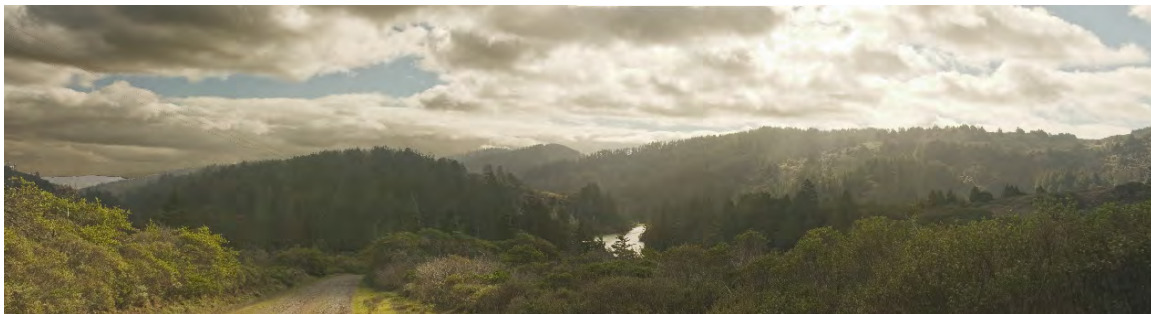
We work in partnership with academic institutions as well as federal and regional agencies to address this challenging disease. We have developed rigorous protocols for minimizing the introduction and spread of harmful species in our watersheds.

For example, the SFPUC requires that all plants used for restoration projects must be healthy

and be free of any pests, pathogens, or weeds. Similarly, equipment used in restoration or construction projects in the watershed must arrive clean and free of invasive species, and be cleaned again before being moved to a new location.



Pilarcitos Creek Integrated Watershed Management Plan - In December 2008 the Pilarcitos Creek Integrated Watershed Management Plan (Pilarcitos IWMP) was completed. In January 2011, the SFPUC entered into a 2-year Memorandum of Understanding (MOU) with San Mateo County Resource Conservation District (SMCRCD), Coastside County Water District, and Sewer Authority Mid-Coastside to continue to fund the SMCRCD's administration of the Pilarcitos IWMP, and the continuing operation of the Pilarcitos Creek at Half Moon Bay USGS Gauging Station.



Panoramic View from Fifield-Cahill Ridge Trail

Bay Area Ridge Trail Extension - The SFPUC received a \$185,000 grant from the California Coastal Conservancy to plan and design the trail alignment, prepare engineered plans, and conduct environmental review. The proposed project will extend the Ridge Trail 4.7 miles from Highway 92 south along the western boundary of the Peninsula Watershed. The proposed trail will be multi-modal and provide access to hikers, bikers, and equestrians. Trailhead improvements at the existing Cemetery Gate trailhead will provide additional accessible parking and trail event staging enhancements for the Fifield-Cahill Ridge Trail Program. A draft geotechnical report was completed in April of 2013 verifying that the geologic conditions on site will support and sustain the trail alignment as currently proposed. The SFPUC was selected for a construction grant in the amount of \$1,000,000 in May of 2014 from the Metropolitan

Transportation Commission Priority Conservation Area Grant Fund Program. The federal and state environmental review process will be conducted in 2016, and construction should begin in summer of 2017.

North San Andreas Connector - This trail connection will provide 1.25 miles of new trail from San Mateo County's North San Andreas Trail to GGNRA's Sweeney Ridge property at the Sneath Lane gate (see map, "Planned North San Andreas Connector"). The trail will be multi-modal and provide access to hikers, bikers, and equestrians. The design was initiated July 2013 and is expected to be completed by Summer 2016. Environmental review and final design would then be initiated, with construction targeted for Spring/Summer 2018.



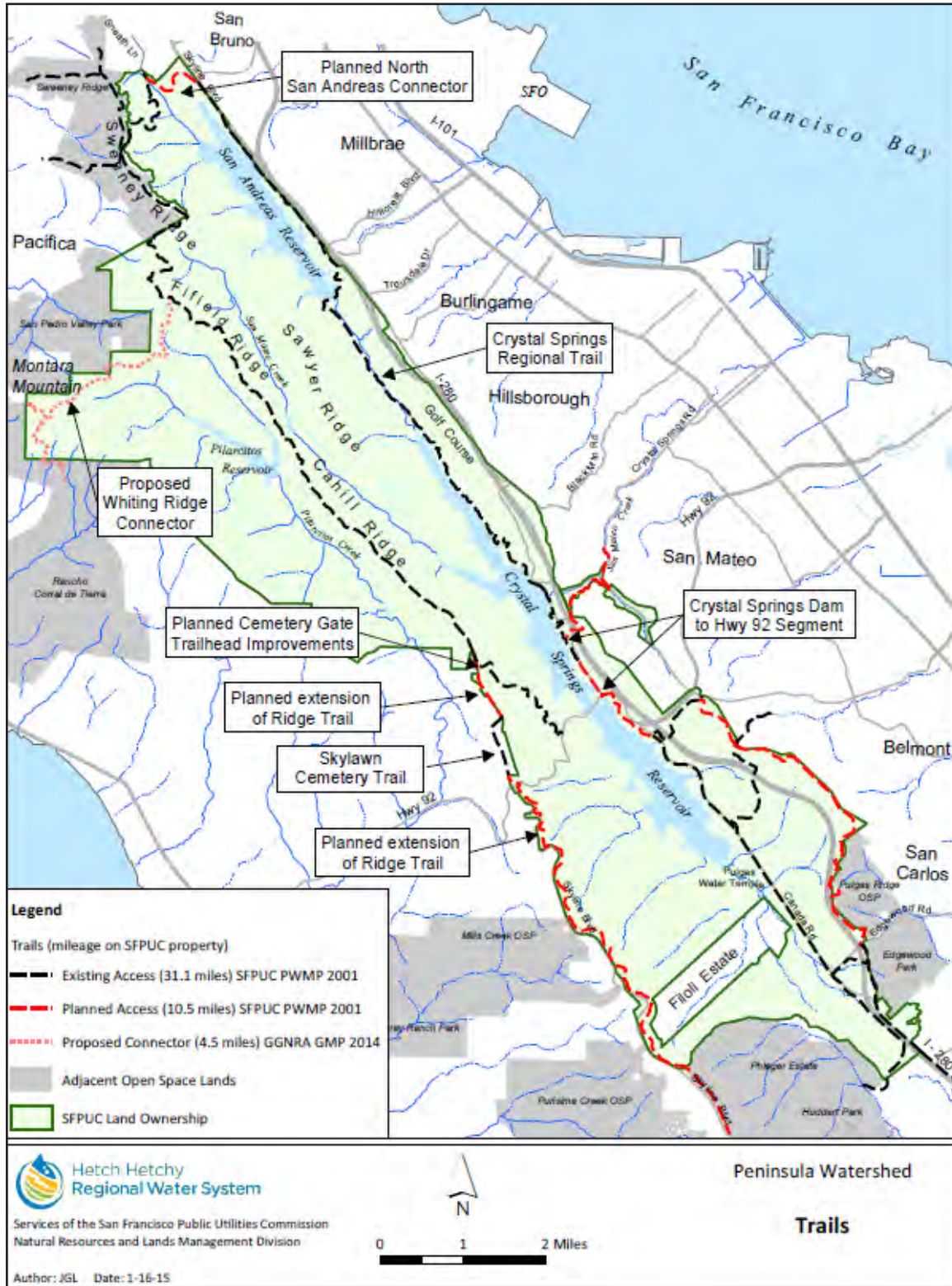
Fifield-Cahill Ridge Trail

Crystal Springs Regional Trail Construction - In November 2013 the SFPUC approved a Memorandum of Understanding with San Mateo County to contribute towards the funding of trail improvements on the Crystal Springs Regional Trail, which is operated and maintained by San Mateo County Parks. The funds were used for the construction of security and watershed fencing for the South of Lower Crystal Springs Dam segment in 2014. This newly constructed trail segment will help close one of the remaining gaps in what will eventually be a 15-mile continuous trail in the Peninsula Watershed.



Pulgas Temple Interpretive Signs - The SFPUC installed three interpretive panels at the Pulgas Temple in 2014. The panels describe the history of the Pulgas Water Temple, the history of the Hetch Hetchy Regional Water System, and SFPUC's efforts to protect the natural resources of the Peninsula Watershed. The project also included the installation of a water bottle filling station to encourage the use of reusable water bottles.

Peninsula Watershed Trail Projects



Hillsborough Chocolate Lily - In 2015 WEIP began supporting conservation efforts for the Hillsborough chocolate lily. *Fritillaria biflora* var. *ineziana* is a narrow ranging endemic perennial in the Liliaceae (lily) family only known to occur in the Hillsborough area of San Mateo County. The California Native Plant Society ranks *F. biflora* var. *ineziana* as seriously endangered in California and the SFPUC's population of plants near the Crystal Springs Reservoir is the last known population according to local consulting botanists.

As a first measure, seed banking was prioritized to help insure the continued existence of the species. Future conservation measures are planned that include habitat enhancement, protection, and ex situ establishment activities as components of a species recovery management strategy.



Hillsborough Chocolate Lily

San Francisco Lands

The SFPUC has continued to work with the San Francisco Recreation and Parks Department (RPD) Natural Areas Program (NAP) to manage Lake Merced and protect its natural resource values under a Memorandum of Understanding approved in July 2013. The SFPUC has also started to work with RPD to protect other SFPUC properties including Twin Peaks, Laguna Honda, and the O’Shaughnessy tract. The SFPUC provides funding to RPD NAP to manage these properties and to work with the Bay Area Ridge Trail Council on a proposed trail realignment that will connect Twin Peaks and nearby Mt. Sutro.



Lake Merced



Laguna Honda



Twin Peaks



O’Shaughnessy tract

Tracking WEIP Investments

The past and future WEIP expenditures are summarized below in detail. As shown on the final page of this report, approximately \$21.6 million was spent in the first 10 years of the program, and it is estimated that \$15.3 million will be spent in the current fiscal year (FY 15/16), for a total of \$36.9 million in the first 11 years. The remaining \$13.1 million is anticipated to be expended over the following 2 fiscal years (FY 16/17 through FY 17/18).

The Water Enterprise anticipates that approximately 90% (\$18 million) of the Measure A bond funds (\$20 million) dedicated to WEIP will be spent on property acquisition (permanent conservation easements and/or fee title) in the upper Alameda Creek watershed and on education projects. The remaining bond funds (10% or \$2 million) will support planning and project management.

The operating budget funds (\$30 million) are expected to be distributed over all of the watershed areas. Approximately 50% (\$15 million) is expected to be spent in the Alameda Creek watershed on habitat protection, restoration, preservation, outreach and education, and increased public access. Approximately 20% (\$6,000,000) is expected to be spent in the Tuolumne River watershed, and approximately 30% (\$9,000,000) is expected to be spent in the Peninsula Watershed, within San Francisco, and/or the Right of Way focusing on habitat protection, restoration, and preservation, outreach and education, and increased public access.

To date, bond and operating funds that have contributed to meet WEIP commitments have been expended as follows: Tuolumne River Watershed - \$6,133,337 (28%), Alameda Creek Watershed - \$9,665,638 (45%), Peninsula Watershed and San Francisco - \$4,230,762 (20%), Planning and Project Management - \$1,521,589 (7%).

Watershed and Environmental Improvement Program (WEIP) Tracking Implementation			
Funding Source	Estimated expenditures FY 05/06 through FY 15/16	Remaining needed to meet \$50 million commitment	Total
Proposition A Bond Funds	\$18,372,406	\$1,627,594	\$20,000,000
Operations Budget - Revenue Funded Capital (CUW257, CUW264, CUH996)	\$18,534,395	\$11,465,605	\$30,000,000
Total	\$36,906,801	\$13,093,199	\$50,000,000

Looking Forward

This Annual Report will be updated and provided to the Commission annually, and staff will continue to meet with BAWS regularly to provide updates on annual priorities and track expenditures. NRLMD staff will continue to assess ecosystem restoration and land protection needs to ensure that WEIP funds are strategically spent to maximize investments and meet the objectives of the Stewardship Policy. It is anticipated that in the next few years the WEIP will help support the Alameda Creek Watershed Center, the SFPUC Bay Area Ridge Trail Extension, a Historical Ecology Study of the Peninsula Watershed, and a large conservation easement in the upper Alameda Creek Watershed.

Conclusion

Taken together, the WEIP investments have led to significant steps toward achieving the goal and objectives laid out in 2006. The investments anticipated to be made in the next few years with the remaining WEIP funds will carry us that much further toward the goal.

WEIP PROJECTS BY WATERSHED (6/30/15)

Project	Description	FY 05/06	FY 06/07	FY 07/08	FY 08/09	FY 09/10	FY10/11	FY11/12	FY12/13	FY13/14	FY14/15	FY15/16 est.
Alameda Creek Watershed												
Nolan Ranch Acquisition and Conservation Easement	Purchase 1,157 acres in the upper Alameda Creek Watershed in partnership with TNC and SCC and provide funding for an endowment for TNC to monitor the conservation easement on the property								\$999,817			
Old Property Acquisition	Purchase approximately 260 acres in the San Antonio Watershed							\$1,300,000				
AC Watershed Protection Project	Outreach to property owners regarding purchase of property or conservation easements				20,000	\$33,878	\$22,662	\$6,760				
Conservation Easements/Acquisition	Provide funding to develop conservation easements and/or acquire property to protect water quality											\$8,600,000
Conservation Easement Education/Facilitation	Educate landowners about conservation easements and assist in developing conservation easements					\$17,585	\$30,426	\$15,165	\$29,565		\$9,924	\$25,000
Alameda Creek Watershed Center In Sunol	Interpretive Master Plan and exhibit design and education program development						29,857	\$73,382	\$54,325	\$17,000	\$119,660	
Alameda Creek Watershed Center in Sunol	Construction of the Alameda Creek Watershed Center											\$4,300,000
Native Plant Nursery												\$500,000
SAGE	Develop implement Sunol Ag Park 4th-8th grade curriculum	\$0	\$65,000			\$43,062	\$46,962	\$89,365	\$65,615	\$65,000	\$65,000	\$50,000
AgPark Transition												\$63,498
Rare plant survey	Conduct focused rare plant surveys of the Alameda Watershed			\$52,000								
Niles Gage Weir Assessment	Determine the structural integrity of the weir and provide recommendations and alternatives				\$51,000	\$10,000	\$10,000	\$10,000	\$10,000	\$0	\$0	\$10,000
Alameda Creek Fisheries Restoration Workgroup	Flow studies	\$0	\$6,662	\$838	\$22,500	\$82,246		\$70,000				
Historical Ecology Study	Partner with ACFC&WCD to fund SFEI to conduct a Historical Ecology study of the AC Watershed					\$150,000	\$100,000					
Rangeland Monitoring	collect spring season species composition data to complete baseline data				\$55,000	\$10,000						
Weed Survey	Conduct non-native plant species inventory and mapping			\$62,298								
Niles/Sunol Dam Removal	Dam removal to provide fish passage	\$0	\$1,505,000									
Arroyo de la Laguna Restoration #1	Creek bank stabilization	\$0	\$467,821									
Calaveras Reservoir HOS	Installation of a Hypolimnetic Oxygenation System (HOS) at Calaveras Reservoir	\$1,381,600	\$0									
San Antonio Reservoir HOS	Installation of a Hypolimnetic Oxygenation System (HOS) at San Antonio Reservoir	\$0	\$68,833	\$182,717	\$400,000	\$1,724,113						
New Zealand Mud Snail Survey	Conduct surveys in Alameda Creek to determine the presence of the New Zealand Mud Snail			\$13,000								
	Total	\$1,381,600	\$2,113,316	\$310,853	\$548,500	\$2,070,884	\$239,907	\$1,564,672	\$1,159,322	\$82,000	\$194,584	\$13,548,498
Peninsula Watershed												
SOD Adaptive Management Project	Treat a stand of Tan Oaks with AGRIFOS to try to slow down the spread of Sudden Oak Death			\$92,660	\$125,000		\$100,000		\$25,000	\$25,000	\$50,000	\$100,000
San Mateo thornmint Restoration	Introduce thornmint at two locations in the Watershed and monitor for 7 years						\$100,000					
Pilarcitos Creek IWMP	Develop Watershed Management Plan for the Pilarcitos Creek Watershed	\$0	\$67,500	\$29,032								
Pilarcitos Stream Gage Operation	Provide funding with CCWD and SAM to operate the lower Pilarcitos Creek Stream Gage						\$20,575					
Pilarcitos IWMP Administration	Provide funding with CCWD and SAM for SMRCD to continue to oversee administration of the IWMP						\$7,500					
SFPUC Bay Area Ridge Trail Extension	Planning, design and permitting for project alignment					\$118,692		\$185,000	\$60,000		\$1,436,308	
Sneath Lane to N. San Andreas Trail Extension	1.25 miles of new trail from North San Andreas Trail to GGNRA Sneath Lane gate								\$28,000		\$22,000	\$100,000
Weed Survey	Conduct non-native plant species inventory and mapping			\$62,297								
Pulgas Interpretive Signs	Design and install several interpretive signs near the Pulgas Temple								\$24,000			
Crystal Springs Regional Trail	Project funds trail improvements on the Crystal Springs Regional Trail										\$300,000	
Historical Ecology Study												\$410,000
Peninsula Trials Interpretive Master Plan												\$77,500
	Total		\$67,500	\$183,989	\$125,000	\$118,692	\$228,075	\$185,000	\$137,000	\$25,000	\$1,808,308	\$687,500
San Francisco Properties												
Lake Merced Watershed Management Plan	Develop watershed Management Plan for the Lake Merced Watershed	\$0	\$50,000			\$200,000						
Lake Merced Infrastructure	Planning and design of upgrades to stormwater system in the Sunset Circle Parking Lot	\$250,000	\$250,000									
Laguna Honda Scrub Restoration	Restoration of the native coastal scrub that occurs within a portion of the Laguna Honda reservoir.								\$252,198			
Rec and Park Natural Areas Program	Includes Twin Peaks, Laguna Honda, O'Shaughnessy and Brotherhood Way										\$350,000	\$350,000
	Total	\$250,000	\$300,000			\$200,000			\$252,198		\$350,000	\$350,000
Upper Tuolumne River (above Don Pedro Reservoir)												
Amphibian Survey	Conduct amphibian surveys between O'Shaughnessy Dam and park boundary				\$40,346	\$50,000		\$29,437	\$40,361	\$42,379	\$40,058	\$41,057
Looking Downstream	Conduct a comprehensive assessment of the riverine and riparian ecosystem b/w O'S Dam and Early Intake	N/A	\$210,501		\$112,540	\$139,628	\$179,553	\$273,160	\$160,927	\$168,974	\$159,945	\$167,974
Upper TR Ecosystem Project	A collaborative, science-based effort to improve stewardship of the Upper Tuolumne River	\$0	\$68,500		\$215,000	\$215,000	\$500,000	\$500,000	\$215,000	\$215,000	\$215,000	\$215,000
Invasive Plant Treatment	Comprehensive Himalyan blackberry removal along 6 miles of the Tuolumne River							\$30,770	\$90,816	\$95,357	\$95,085	\$95,446
Earth Economics Report										\$30,000		
	Total		\$279,001	\$0	\$367,886	\$404,628	\$679,553	\$833,367	\$507,104	\$551,710	\$510,088	\$519,477
Lower Tuolumne River (below Don Pedro Reservoir)												
Dos Rios Ranch Acquisition	Provide funding to develop conservation easements and/or acquire property to protect water quality						\$2,000,000					
	Total	\$0					\$2,000,000					
Planning/Project Management												
Planning/Project Management	staff time(NR, RES, CAO) to plan, implement and manage WEIP projects	\$0	\$5,765	\$138,042	\$160,014	\$163,721	\$180,546	\$266,780	\$217,100	\$221,640	\$167,981	\$250,000
	TOTAL	\$1,631,600	\$2,765,582	\$632,884	\$1,201,400	\$2,957,925	\$3,328,081	\$2,849,819	\$2,272,724	\$880,350	\$3,380,961	\$15,355,475
	AC Watershed Total	\$9,665,638										
	Peninsula Watershed Total	\$2,878,564										
	San Francisco Total	\$1,352,198										
	Upper TR Total	\$4,133,337										
	Lower TR Total	\$2,000,000										
	Total Project Management	\$1,521,589										
	All WEIP RnR Projects	\$14,775,940										
	All WEIP Bond Funded Projects	\$5,212,406										
	All WEIP Projects Grand Total	\$21,551,326										

* Totals do not include FY 15/16 est.