

3.1 COUNTY WATERSHED ACTIVITIES OVERVIEW

Watershed Management Division staff working within each of the county watershed management areas are responsible for certain core regulatory programs (water quality certifications, stormwater NPDES, non-chapter 15 Waste Discharge Requirements) and some nonpoint source program areas. In addition, Planning and TMDL Division staff implement nonpoint source activities (with a major focus on TMDL implementation), oversee 319(h) and some state bond-funded grants, provide technical guidance on specific watershed projects, and conduct public outreach and education efforts. Increasingly our focus is on developing general permits and waivers as appropriate, as well as seeking opportunities to coordinate permit reissuance on a watershed basis.

As noted in the Regional Activities Section 2.0 above, our Groundwater Protection and Toxics Cleanup Division staffs work on site cleanups of polluted groundwater, landfills, underground tank programs and cleanups at Department of Defense and Department of Energy sites. The NPDES Division addresses permit reissuance and compliance of large facilities in the Region.

The following sections describe the geography, land uses, and ecology of county watershed areas; discuss the significant water quality issues; describe existing watershed planning and stakeholder activities; and provide a general list for the next two years of the major activities in our staff workplans for each of the counties. These sections also include a list of some of the major unfunded activities of importance in each county and Water Board grant priorities for each county. Each section includes a regional map, based on the 1995 Basin Plan watershed boundaries, that includes the major watersheds and sub-watersheds discussed in the County section.

3.2 ALAMEDA WATERSHED MANAGEMENT AREA

Overview

Bordering the east bay shoreline of San Francisco Bay, Alameda County encompasses 738 square miles of land and has a total population of approximately 1.5 million. Highly urbanized in the western portion, eastern Alameda County still has considerable agricultural and open space lands (although substantial land development is predicted during the next 10 years). The County has 500,000 acres of rangeland and woodlands. Elevations range from sea level along the 36 miles of bay shoreline to 3,817 feet in the Diablo Mountain Range south of Livermore. The County is approximately 32 miles long in a north-south direction and 45 miles wide (Figure 3-1).

The county is a diverse combination of land types and forms. The western portion contains an urban corridor running from Albany and Berkeley in the north through Oakland, San Leandro, Hayward and Fremont in the south, with a narrow fringe of marshlands along the Bay and large tracts of parklands, grazing lands, and open space in the East Bay Hills. The eastern portion of the county varies from gently rolling terraces and alluvial plains to the steep V-shaped upland areas. The population is concentrated in the highly urbanized Bay Plain along the Bay and in the suburban towns of Dublin, Pleasanton, and Livermore to the east of the East Bay Hills.

Northern Alameda County imports its drinking water from Sierra Nevada sources serviced by the East Bay Municipal Utility District. There are five major reservoirs in the County, three of which are located in the Alameda Creek watershed. Southern and eastern Alameda County also relies on groundwater basins to augment surface water supplies.

Watershed Descriptions

The Alameda Creek watershed is the largest drainage in the southern San Francisco Bay region, encompassing almost 700 square miles and covering sections of Alameda, Contra Costa and Santa Clara Counties, draining roughly the southern two-thirds of the East Bay. To the west, its tributaries drain from the Coast Range, to the east from the foothills of Mt. Hamilton. The southern portion of the watershed includes remote wildlands along upper Alameda Creek within Sunol and Ohlone Regional Wilderness Preserves and SFPUC watershed lands. The northern portion of the watershed includes the rapidly urbanizing towns of Livermore, Pleasanton, Dublin, and San Ramon in the Livermore Valley along the Arroyo Mocho and Arroyo de la Laguna tributaries. The middle of the watershed is in the hamlet of Sunol and includes the Sinbad and Stonybrook Creek tributaries in Niles Canyon. The lower portion of the watershed includes the urbanized Tri-City area of Fremont, Union City, and Newark on the San Francisco Bay Plain. .
Flows in the upper reaches of the Alameda Creek watershed are controlled by water releases from the Calaveras Reservoir, which is managed by the City and County of San Francisco. The Calaveras Reservoir captures natural runoff and stores imported water from the Hetch Hetchy reservoir. The intermediate area of the watershed is controlled by

the Zone 7 Water district, which harvests the local runoff. Supplies for public and wildlife use come from the State Water Project. The Alameda County Water District manages the lower reaches of the watershed. Water from Alameda Creek is used for groundwater recharge in the Niles Cone groundwater basin before it discharges into San Francisco Bay.

Significant Watershed Issues

New development is a major watershed issue in Alameda County. Both new and existing development are primarily concentrated in valley floors and coastal plains, but development pressure means that hillside properties are being increasingly developed. Environmental problems may be aggravated if growth is not managed carefully, particularly in hillside areas where land clearing exacerbates erosion and impacts stream corridors. There is increased pressure on creeks and wetlands, and the challenge is to preserve creek functions and meet no net loss of wetlands criteria.

A large focus of Water Board staff effort is in working closely with the Alameda Clean Water Program to implement their stormwater permit and working with agencies and private parties on water quality certifications. Major issues include stream and wetland impacts from proposed new development and existing development; water quality impairment from pesticides, fertilizers, animal waste, automobiles, and other typical urban runoff pollutants; changes to the hydrograph of watersheds due to development and increase of impervious surfaces; and water quality impacts from industrial and commercial site development.

Alameda Creek is one of the most significant watersheds in the region, due to the great diversity of species found there, and because it harbors one of the few remaining remnant steelhead populations in the East Bay. Adult steelhead thought to be native to Alameda Creek have been documented in the flood control channel attempting to migrate upstream during winter spawning runs from 1997 through 2006. Migration barriers, from the BART weirs to inflatable dams for groundwater recharge, have kept them from reaching the relatively unspoiled upper reaches of the watershed. Despite extensive urbanization, flood control projects, and major dams, Alameda Creek still supports one of the best assemblages of native stream fishes in the San Francisco Bay region. At least a dozen native fish species have been documented in recent years, including rainbow trout, Pacific lamprey, California roach, threespine stickleback, prickly sculpin, and tule perch.

Concerns about aquatic habitat in this watershed include fragmentation caused by urbanization, herbicide and pesticide use, stream habitat degradation caused by excessive cattle grazing and associated soil erosion, direct livestock impacts to stream corridors through bank scarring and collapse from animal passage, similar impacts from wild pigs, and stream obstructions. A stakeholder group of livestock and rangeland managers has formed to begin to address these issues in the entire Alameda Creek watershed.

In the upper watersheds of Alameda County, water quality issues soil erosion, pathogens and nutrients from cattle grazing. In several watersheds such as San Lorenzo and San

Leandro Creeks, there are nonpoint source pollution from the many equestrian facilities that are located near creeks, increasing vineyard development, and threats to groundwater recharge areas from upstream activities.

Water recycling and reclamation are important issues discussed in the Alameda Creek Watershed Management Initiative. The local grape growers, agriculture, and new development are examining the use of recycled water for irrigation. In addition, wastewater dischargers promote water recycling. Local water purveyors have been discussing groundwater injection of highly treated (reverse osmosis) recycled water for drinking. Wastewater discharges include two deep-water outfalls into Central San Francisco Bay (East Bay Municipal Utilities District, East Bay Dischargers Authority and Livermore Amador Valley Water Management Agency). A portion of the Union Sanitary District discharge is reclaimed into the Hayward Marsh.

Several creeks in Alameda County are considered impaired as a result of the potential for diazinon discharges to adversely affect aquatic life. Diazinon is a broad-spectrum organophosphate pesticide used for agricultural pest control, structural pest control, landscape maintenance, and other home and garden applications. Runoff from urban areas contains diazinon at levels potentially harmful to some aquatic organisms. Alameda Creek, Arroyo de la Laguna, Arroyo del Valle, Arroyo Hondo, San Leandro Creek, and San Lorenzo Creek have been named specifically because substantial parts of their watersheds include developed urban areas and because they support beneficial uses related to freshwater aquatic habitat. Diazinon may also be of concern in other Alameda County creeks, particularly if they pass through urban areas and support aquatic life. The Regional Board has developed an urban pesticides Total Maximum Daily Load (TMDL) that will address pesticide toxicity in Bay Area urban creeks. Through this process, it will investigate the extent of the problem, identify diazinon sources, allocate diazinon loads among the sources, and implement control measures.

Lake Merritt is considered impaired as a result of floating material and organic enrichment (low dissolved oxygen). In addition, Alameda County storm water and wastewater contribute to impairment of San Francisco Bay, and the Regional Board is developing TMDLs to address water quality problems in the Bay, such as mercury, copper, and polychlorinated biphenyls (PCBs).

Other issues include impacts to creeks from discharges of turbid and high pH waters from quarries and mines in Livermore Valley, degradation of groundwater quality in Livermore Valley from salt loading, and water quality impacts associated with Dublin/Livermore reclaimed water projects.

Watershed Groups and Watershed Management Efforts

The Alameda Countywide Stormwater Program began in 1987 and is an effort of the fourteen cities in Alameda County, and the County working together under a Municipal NPDES Stormwater Permit. This program, working with Alameda County Public Works Agency staff and Board staff, has taken an innovative, leadership approach to solving

many difficult problems. County Public Works staff are responsible for the County Clean Water Program, which includes monitoring and watershed assessment, creek restoration, illicit discharge and connection inspection, and promoting best management practices in both local agencies and in the wider community. County activities include working to re-establish fish runs in the San Lorenzo Creek and Alameda Creek Watersheds and working with the community to support watershed awareness and stewardship.

The City of Oakland has been a leader in creek programs through its Watershed Improvement Program. The City and the Alameda County Flood Control and Water Conservation District (ACFCWCD) have partnered to create the Collaborative Creek Improvement Program (CCIP) to restore, preserve, and improve Oakland's creeks. The CCIP includes implementation and training for alternative flood control, soil bioengineering training, riparian restoration, illegal dumping mitigation, water quality improvement, and community outreach and involvement. This program has been able to fund restoration projects on Peralta Creek, Arroyo Viejo, and Sausal Creeks. Oakland also partners with the ACFCWCD to implement Watershed Awareness Programs, whose goal is to establish long term community stewardship and leadership in specific watersheds. Current Watershed Awareness Programs include the Friends of Sausal Creek; a program for Arroyo Viejo Creek is under development. More information about these programs is available at www.oaklandpw.com.

A number of efforts are underway in the Alameda Creek watershed to remove barriers to steelhead migration. Migratory fish are currently blocked by impassable barriers in the creek, and the restoration of this fishery has galvanized both citizen activists and local agencies in the past several years. The Alameda Creek Alliance was formed by citizens mobilized to save the steelhead run. In 1999 the Alameda Creek Fisheries Restoration Workgroup was formed to address fisheries restoration issues. This group includes 15 public agencies as well as the Alameda Creek Alliance and other environmental representatives.

The Alameda County Public Works Agency received funding from U.S. Army Corps of Engineers to construct a fish ladder past the primary barrier to anadromous fish migration on Alameda Creek. This fish ladder will consist of a large concrete railway bridge support structure in Fremont. The Alameda Creek Alliance, a local citizens' group, actively supports this proposal. Some progress is occurring on lands controlled by the East Bay Park District and the City and County of San Francisco.

In summer 2005 a group of interested parties including Water Board staff, Friends of the San Francisco Estuary, East Bay Watershed Center, The Watershed Project and others initiated an Alameda County Watershed Forum to provide opportunities for the creek and watershed community of Alameda County to work together collaboratively on creek protection and education and outreach. At the first meeting in September 2005, about 30 people representing friends of creek groups, watershed councils, educational groups, federal, state and local government agencies came together in Fremont to develop a list of interests and priorities. Some of the highest priorities identified for an Alameda County Watershed Forum were to promote actions to protect creeks and watersheds, provide a

clearinghouse and forum for information sharing on funding and other topics, promote involvement by permanent staff at city and county levels, and promote collaboration and trust-building among creek and agency groups. Some of the high priority needs for creeks and watersheds were identified as development of long-term funding strategies (including watershed coordinators and technical help), formation of a regional coalition, technical training for restoration and monitoring, and educational opportunities. The forum has been meeting regularly since that time, supported primarily by staff from the Water Board and Alameda County Clean Water Program, as well as the Watershed Project, San Francisco Bay Joint Venture and several interested citizens. In 2010, the County was able to hire a part-time coordinator to coordinate events, maintain a website, and do outreach. The Forum will continue under the auspices of the County and the Alameda County RCD, with an emphasis on web-based watershed mapping and helping coordinate efforts with other watershed groups in the County.

In 2008, the Alameda County RCD spearheaded the organization of the Alameda Creek Watershed Council, and the Water Board signed on to the Letter of Understanding as a watershed partner. The Watershed Council's mission is to protect and enhance water related beneficial uses and resources in the Alameda Creek Watershed in order to create a healthy and sustainable watershed for the community. The Council promotes collaboration and the sharing of information among all stakeholders. The Council meets monthly and holds an annual symposium as well as supporting projects in the watershed.

There are also many active citizen-based watershed groups in the County, some supported by agency funds and grants, others entirely volunteer based. These include Friends of Sausal Creek, Friends of San Leandro Creek, Friends of Five Creeks, and the Codornices Creek Watershed Council, among others. Water Board staff have been involved in these activities at various times.

Proposed Workplan for FY 2010-11/2011-12

- Take action on 401/404 water quality certifications
- Reissue NPDES and Waste Discharge Permits
- Complete pretreatment compliance inspections
- Conduct annual compliance inspections
- Provide guidance on permanent new development stormwater treatment measures,
- Take enforcement actions as needed

High Priority Unfunded Activities

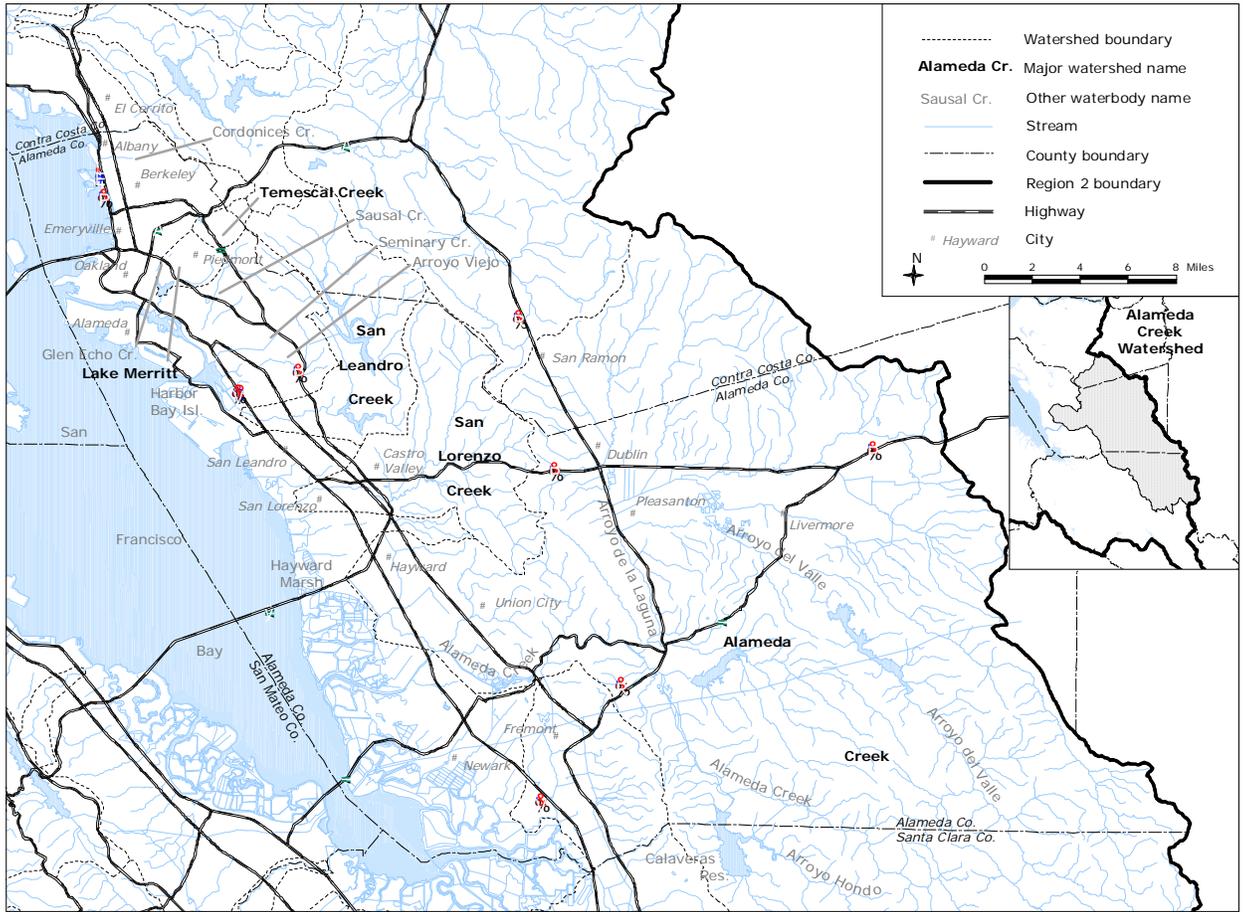
- Develop BMP's for grazing for water district and park watersheds, and general rangeland
- Work with Natural Resource Conservation Service and Alameda County Resource Conservation District on grazing issues
- Oversee reclamation process in Livermore Valley
- Participate in salt management activities in Livermore Valley
- Participate in Alameda Creek Watershed Management Initiative
- Complete CEQA reviews for general plans and development projects

- Assist in removing barriers to anadromous fish migration on Alameda Creek

High Priority Projects for Grant Funding

- Riparian habitat and stream restoration projects
- Tidal wetland restoration in former salt ponds to provide habitat for native species, enhance estuarine and tidal marsh habitat, and increase primary carbon productivity
- Re-establishing the delta at the mouth of Alameda Creek by integrating tidal wetland restoration in former salt ponds with planned flood control projects.
- Fish passage barrier removal in Alameda Creek watershed

Figure 3-1. Alameda County Watersheds



3. 3 CONTRA COSTA WATERSHED MANAGEMENT AREA

Overview

Contra Costa County (Figure 3-2), located in the geographic center of our Region, is bounded by San Francisco Bay and San Pablo Bay to the west, Suisun Bay and the channels of the Sacramento and San Joaquin Rivers to the north, Alameda County to the south, and to the east by San Joaquin County. The total area is approximately 800 square miles and contains a population of close to one million people (2000 census). The County includes 19 municipalities and a large unincorporated area, particularly in the eastern portion of the County. The predominant economic resources of the county include the petroleum and chemical industries and agriculture, which is made up primarily of range and pasturelands.

The County can be divided into 3 geographic areas: West County, Central County, and East County. Approximately three-fifths of the County is within the boundary of Region 2's jurisdiction, including all of West and Central County and small portions of the East County. The remainder of the East County is within the jurisdiction of the Central Valley Regional Board, Region 5. *West County* includes a highly urbanized strip along the shores of San Francisco Bay and Carquinez Strait and the Highway 80 corridor, with a mixture of residential and commercial and industrial uses. Major industries in this area include petroleum refineries and chemical companies. *Central County* includes major urban centers along Interstate 680 and Highway 24, as well as the industrialized area along the eastern Carquinez Strait, and the open space areas of Mt. Diablo State Park and other public lands of the East Bay Regional Park District, California Department of Parks and Recreation, East Bay Municipal Utility District, and Contra Costa County Water District. *East County* is predominantly undeveloped with agricultural uses comprising 70% of the watershed. Urbanized land uses comprise only 13% of the land area and the major receiving water is the Delta.

Watershed Descriptions

Contra Costa County has 31 major watersheds and sub-watersheds containing more than 1300 miles of creeks and drainages. All but eight of these watersheds are entirely within Contra Costa County. The largest watersheds in Contra Costa County within Region 2 boundaries are Walnut Creek (93,556 acres), San Ramon Creek (tributary to Walnut Creek, 32,915 acres), and San Pablo Creek (27,640 acres). The County also includes the upper portion of the 700 square mile Alameda Creek watershed, which is one of the most important watersheds in the Bay Area for both habitat and public drinking water supply. While the Walnut Creek Watershed is very large and spans many cities, many of the other watersheds are conveniently "community-sized". For instance, Alhambra and Pinole Creeks are closely identified with (and are important features of) the Cities of Martinez and Pinole respectively.

Two major complexes of mountains, ridges, and hills define the physical and hydrological landscape of the County. The first of these ridgeline complexes centers on Mount Diablo, which rises to 3,849 feet above sea level near the center of the County,

and extends south to the Altamont Pass area and the remainder of the Diablo Range in Alameda County. The second major complex of hills and ridges lies between the eastern shore of San Francisco Bay and the major valleys in the center of the County. Las Trampas Ridge, the Oakland-Berkeley Hills, and the Briones Hills are some of the well-known features in this second area.

Tectonic processes created these mountain and ridge complexes, as the Pacific Plate has slipped northward past the North American Plate. Like a piece of fabric that folds and creases when the edges are pulled in different directions, the surface of Contra Costa County has been pulled northward on the bay shore and southward along the edge of the Central Valley, creating a series of ridges and valleys. Due to the orientation of the tectonic movement, ridgelines in the County often run from the northwest to the southeast. These mountain and ridge complexes form the headwaters for nearly all the creeks in the County. Most of these headwater areas have rugged terrain and are not heavily populated or developed. Many headwater areas are used for private rangeland, public parks and watershed land. As creeks flow down to major valleys and coastal plains, the surrounding watershed becomes increasingly developed.

Significant Watershed Issues

New development is a major watershed issue in Contra Costa as in the rest of the Bay Area. A large focus of Water Board staff efforts is on working with the Contra Costa Clean Water Program to implement their stormwater permit and on working with agencies and private parties on water quality certifications. Major issues include stream and wetland impacts from proposed new development and existing development; water quality impairment from pesticides, fertilizers, animal waste, automobiles, and other typical urban runoff pollutants; changes to the hydrograph of watersheds due to development and increase of impervious surfaces; and water quality impacts from industrial and commercial site development.

Both new and existing development are primarily concentrated in valley floors and coastal plains, but development pressure means that hillside properties are being increasingly developed. Environmental problems may be aggravated if growth is not managed carefully, particularly in hillside areas where land clearing exacerbates erosion and impacts stream corridors. There is increased pressure on creeks and wetlands, and the challenge is to preserve creek functions and meet no net loss of wetlands criteria. Land use planning agencies in the County are now attempting to work together to develop creative solutions to these problems. One of these is the development of a Regional Habitat Management Plan by the County for East Contra Costa, to identify habitats, habitat needs, and mitigation sites.

An area of major interest to the Water Board is the cleanup of the Concord Naval Weapons Station (CNWS). CNWS is a 12,800-acre site located in the north-central portion of Contra Costa County, of which 5,170 acres, known as the Inland Area, were used for weapons storage and maintenance. The remaining 7630 acres, known as the Tidal Area, includes large areas of wetlands and a deep-water port for weapons shipment

operations. The contamination in the northwestern area of the Tidal Area comes from past on-base waste disposal practices, including an estimated 3,000 tons of mixed wastes that were deposited in the landfill from the early 1940s to 1979, material and waste generated during the repackaging of conventional munitions, and chipped wood contaminated with pentachlorophenol (PCP). Investigations identified heavy metals to be the primary contaminants in these sites, but low levels of organochlorine pesticides, such as DDT and its breakdown products, and semi-volatile organic compounds (SVOCs) are also present. Other contaminated sites, located in both wetlands and upland habitat on the northeastern portion of the Tidal Area, are the result of private industrial activities on portions of property that was subsequently purchased by the Navy to create a buffer zone for the activity at the facility's piers. Issues include surface water/groundwater connections and potential for leakage from old underground storage tanks and from aboveground storage tanks.

Because of the large amount of public interest and numerous agencies involved at the CNWS, the decision-making process has been long and often difficult; however, the US EPA signed a ROD (Record of Decision) for the Tidal Area landfill capping in May 2004. The construction began in the summer of 2006, but was halted shortly afterward due to the discovery of live ordnance. The site was closed until the summer of 2007 while the Navy completed plans for how to handle other unexploded ordnance that is uncovered. The Navy is also preparing feasibility studies for the cleanup of the sloughs and sediment in the Litigation Area, a 300-acre site bordering Suisun Bay on the eastern side of the Tidal Area of the CNWS. This area was purchased by the Navy to create a buffer zone around the Tidal Area, but was found to be contaminated by several heavy metals by its previous industrial owners. Subsequent litigation with the prior owners was followed by soil excavation and removal in several areas, and studies are underway to remove remaining contamination.

The Department of Defense (DOD) announced in May 2005 that it had included the Inland Area of the CNWS on its list of recommended bases to be closed by the Base Realignment and Closure (BRAC) Commission. The Tidal portion of CNWS will also be transferred to the U.S. Army, and portions of the Inland Area may transfer to the DOD and/or other federal agencies, but the majority of this area is within the Concord city limits and will transfer to the City. The Concord City Council has been holding a series of scoping sessions and public meetings about the development potential for this area in order to develop a reuse plan. The Council agreed to set up a Community Advisory Committee representing neighborhoods, environmentalists, housing advocates and other interests, to help the City develop its plan. Water Board staff will continue to follow this planning process as issues of pollutant cleanup, stormwater runoff management, stream and wetland protection, and others will be integral to future development at this site. This will continue to be a major issue of coordination among many agencies and local stakeholders.

Of particular concern to creek and environmental groups is Mount Diablo Creek, the last free flowing creek in Contra Costa County, which flows through the center of the CNWS. The Contra Costa Resource Conservation District has been facilitating and coordinating a

watershed planning process to develop a Coordinated Resource Management Plan (CRMP) for the Mount Diablo watershed through funding from a Proposition 13 grant from CalFed, managed by Water Board staff. The Planning Group, made up of local stakeholders, has been meeting monthly since June 2005 and has reached consensus on a set of goals for the watershed as well as creek and watershed goals and objectives for the CNPS site. The Planning Group has submitted their recommendations to the City of Concord and hopes to have representation on the Community Advisory Committee.

Other significant issues in the watershed include wastewater discharges from major industries, increase of major industries in East County (e.g., two new proposed power plants with proposed water reclamation for cooling), and proposed redevelopment of several industrial sites, with potential use of wetlands for wastewater treatment along with traditional discharge methods. Issues related to NPDES permitted facilities include dioxin and selenium limits, the inclusion of pollution reduction and waste minimization requirements in industry permits, effluent toxicity from POTWs, and the development and implementation of mass reduction load at petroleum refineries. Issues of potential subsurface contamination that may not be reported to the Water Board or County Environmental Health continue to be a challenge. Another challenge is to work with local municipalities to identify industries that are not currently covered under industrial stormwater permits.

Watershed Groups and Watershed Management Efforts

The Contra Costa Watershed Forum (CCWF) is an outgrowth of the first countywide Creek and Watershed Symposium in 1999. The Forum is an open committee of some fifty organizations, including federal, state, and local agencies; local governments; professional watershed research organization; local non-profit environmental and education organizations; community volunteer groups; and private citizens. The CCWF meets bimonthly, and staff from the Contra Costa County Community Development Agency coordinate the meetings, provide the Forum members with meeting agendas, minutes, bimonthly newsletters, staff reports and related materials, and coordinate various subcommittee meetings and related activities.

The work of CCWF participants is premised on the notion that actions in a watershed are inter-related and, therefore, that broad participation and cooperation is needed to affect change. The members of the CCWF work together to find common approaches to making the County's variety of water resources into healthy, functional, attractive, and safe community assets. Since the inception of the CCWF, there has been a marked increase in watershed restoration and preservation activities, activism, and awareness. New volunteer groups have formed, and programs to educate, research and document the health of creeks and watersheds are more widely available.

The CCCWF also is an example to other counties and has shared their experience and expertise with other local agencies and watershed groups in the region. Under the auspices of the CCWF, the County has initiated creek surveys and volunteer monitoring. Approximately 1400 miles of creeks have been mapped with GIS, using staff and

volunteers. The CCWF and Contra Costa Clean Water Program sponsor a citizen bioassessment monitoring program that trains local citizens to do ongoing annual monitoring to collect baseline data and provide a tool for assessing pollutant impacts. The County has also prepared the *Contra Costa County Watershed Atlas*, a large format, full color, 150-page book of maps, statistics and text about the 28 major watersheds in the County. Though focused on the state of natural ecosystems on the watershed scale, the Atlas also provides information about the human community and the county as an ecoregion. The County has also published an overview of the results of volunteer creek monitoring from 2001—2005 called *Data from the Creeks*. More information on the CCWF and the publications are available at www.cocowaterweb.org.

As noted above in the discussion about the CNWS, the Contra Costa RCD has been a strong partner in the Watershed Forum and has spearheaded a number of watershed planning and assessment efforts in the County. The Mt. Diablo Creek CRMP process is developing a watershed plan under a grant from CalFed that is managed by Water Board staff; they have also completed the *Mt. Diablo Creek Watershed Assessment* (January, 2006). The RCD worked with the NRCS and the San Francisco Estuary Institute to prepare a Sediment Source Analysis and Baseline Water Quality Study for Pinole Creek and the Pavon Creek Sub-basin Assessment (tributary to Pinole Creek). They also have helped to support the Alhambra Creek Watershed Council and Kirker Creek Advisory Group/Partners for the Watershed, as well as several other watersheds located in the Central Valley Region (including Marsh, Brushy, and Kellogg Creeks).

Proposed Workplan for FY 2010/11 and 2011/12

Urban Runoff

- Oversee Contra Costa Countywide Stormwater Program including: review annual report, follow up on requirements issued as a result of our review of the annual report/Program, oversee the initial implementation of their Hydrograph Modification Management Plan, and assist with runoff issues associated with construction and new development

Stream and Wetland Habitat Protection

- Take action on over 100 anticipated CWA Section 401 water quality certifications, including appropriate WDRs and mitigation monitoring reports; for new development, inspect projects sites and take enforcement actions as necessary.

Impacts from Point Source Pollutants

- Reissue NPDES and Waste Discharge Permits as needed
- Complete pretreatment compliance inspections and conduct annual compliance inspections

Program implementation by RWQCB staff and local partners

- Take enforcement actions as needed
- Continue to support the Contra Costa County Watershed Forum and associated organizations through grant management and other activities. Encourage local community partnerships with local government (especially the Contra Costa Clean Water Program and Community Development Department)

- Encourage education of citizens on water quality issues, especially towards training of a County-wide volunteer-based water quality monitoring program
- Support grant funding to continue the volunteer-based water quality monitoring program; support watershed characterization efforts, conduct restoration and invasive species removal activities; and foster citizen water quality education programs.

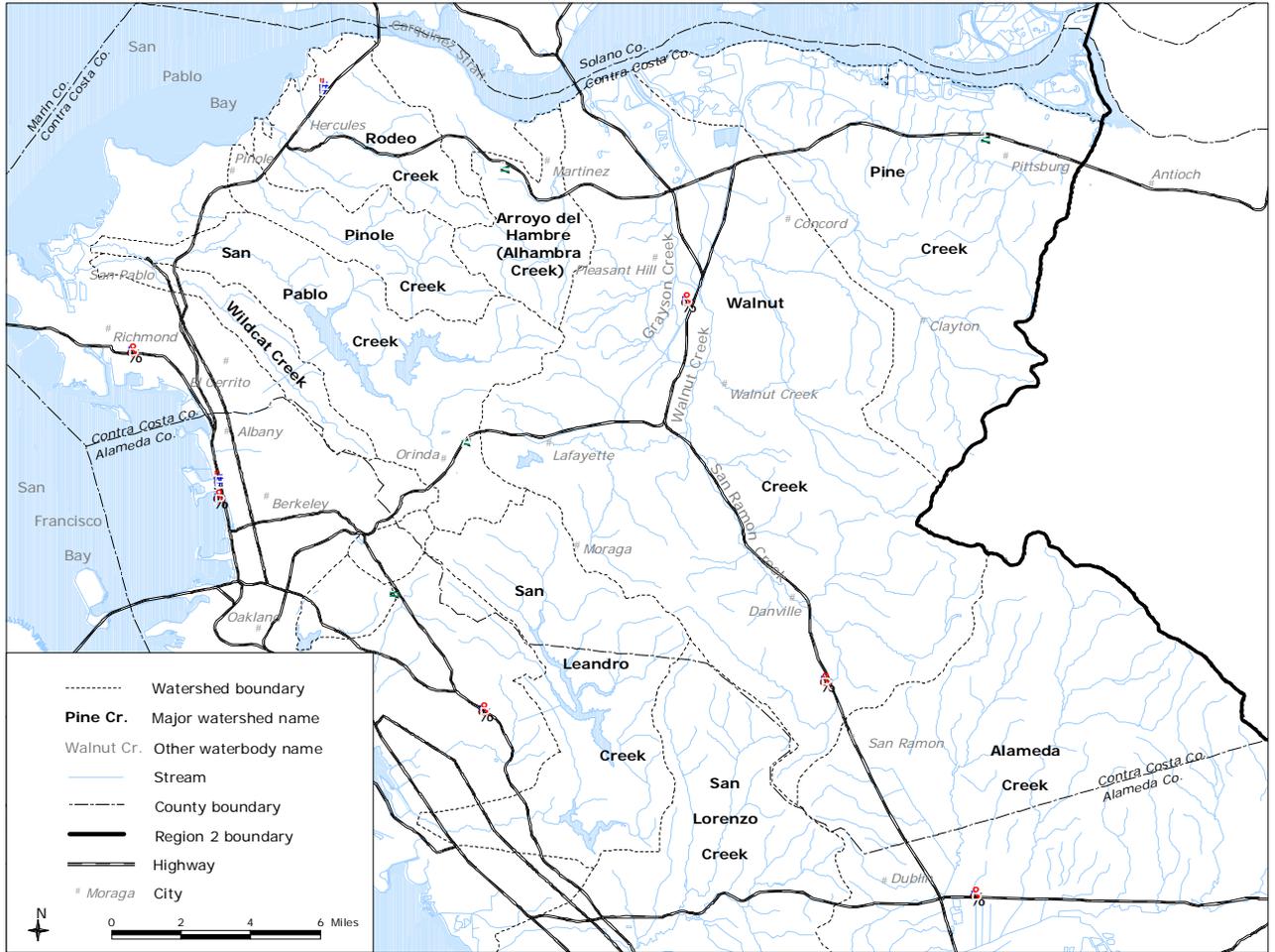
High Priority Unfunded Activities

- Wastewater reuse - on-site alternative reclamation projects
- Grant management and administrative support

High Priority Projects for Grant Funding (both Water Board and County)

- Educating local officials of the value and importance of their creeks and encouraging development of ordinances that protect creeks and riparian areas
- Planning activities at county-wide as well as local watershed levels (through the Contra Costa Watershed Forum); long-term planning for new development mitigation issues (now under the auspices of the CCWF)
- Fostering creek groups and encouraging restoration projects
- Support for citizen monitoring, ongoing support for CCWF, land acquisitions, eradication of exotic plants, and restoring and protecting streams, with a priority focus on fish-bearing creeks.
- Funding for watershed management plans
- Partnering with Alameda County, developing a strategic plan for ongoing stewardship of restoration, and expanding the Stream Management Program for Private Landowners (SMPPL) within the County and in other counties.
- Riparian habitat and stream restoration projects, including further improvements to the Alhambra Creek watershed.
- Restoration activities for creek and floodplain restoration in Pinole Creek watershed

Figure 3-2. Contra Costa County Watersheds



3.4. Marin Watershed Management Area

Overview

Marin County covers 521 square miles and is bounded on the west and south by the Pacific Ocean, on the north by Sonoma County, and on the east by Richardson Bay and San Pablo Bay, the northern arms of San Francisco Bay (Figure 3-3). Marin offers a wide variety of topography, climate, and vegetation, from the tidal flats and wetlands of San Pablo Bay and the rocky intertidal coastline of the Point Reyes Peninsula to the oak woodland, coastal redwoods, and grasslands of Mt. Tamalpais. A significant portion of western and southern Marin County includes the 141,400 acres of open space of Mt. Tamalpais State Park, the Golden Gate National Recreation Area, and the Point Reyes National Seashore, which are recreational resources for the entire Bay Area.

The county can generally be divided into two parts, with differing land uses, population densities, and water quality issues. **East Marin** comprises the relatively heavily urbanized corridor along Highway 101 along San Francisco Bay, consisting of a series of small municipalities extending up the creek valleys. There are 10 incorporated cities or towns, plus unincorporated areas under the jurisdiction of the County of Marin. Land uses are primarily housing, commercial facilities, and light industry, with a few heavier industrial uses such as cement manufacturing, rock quarrying, and machine shops, mostly within or adjacent to the Cities of San Rafael and Novato. The area around Sausalito on Richardson Bay has a number of boatyards and marinas. East Marin is served by several publicly owned sewage treatment systems, including the Sewerage Agency of Southern Marin, Central Marin Sanitation Agency, Novato Sanitary District and the Ignacio Sanitary District, as well as several smaller treatment systems.

West Marin borders the Pacific Ocean and is largely rural, with the major land uses being agricultural (dairies, grazing, and some vineyards and specialty farming) and parklands (federal, state, and county). The area has several small unincorporated under the land use jurisdiction of the County. This area has a number of small wastewater treatment plants and on-site septic systems serving the small unincorporated towns along the coast and along Tomales Bay.

Watershed Descriptions

East Marin: San Francisco Bay

The major watersheds in eastern Marin County are (from north to south) Miller Creek, Gallinas Creek, Novato Creek, San Rafael Creek, Corte Madera Creek, and Arroyo Corte Madera del Presidio. Miller, Gallinas, San Rafael, and Novato Creeks flow eastward from semi-rural headwaters through urban areas and tidal wetlands into San Pablo Bay. Corte Madera Creek and Corte Madera del Presidio flow southeastward from steep hillside headwaters through highly urbanized valleys and discharge into San Pablo Bay and Richardson Bay, respectively. Novato, Corte Madera, and Corte Madera del Presidio Creeks have small steelhead populations. Marin County has extensive tidal and diked wetlands, particularly in the northern part of the county. A large wetland restoration project is underway at the old Hamilton Air Force Base in Novato, and large wetland areas at Bel Marin Keyes and Bahia have been preserved as public land through purchases within the past decade.

South and West Marin: Pacific Ocean and Tomales Bay

On the west side of the County is the 6800-acre Tomales Bay, one of the major estuaries on the Pacific Coast of California. Its diverse ecosystem supports abundant wildlife, and it is a very popular recreation area for kayaking, hiking, and sightseeing. Tomales Bay is an important haul out area for marine mammals and a migratory stop along the Pacific Flyway for many bird species. The Bay is one of four commercial oyster growing areas in California (the others are Drake's Estero, also in West Marin within the Point Reyes National Seashore on the Pacific Ocean, Humboldt Bay in Region 1, and Morro Bay in Region 3), and the Bay is also known for its commercial fisheries and recreational crabbing, clamming and fishing. The Bay is surrounded by significant areas of federal, state, and county parklands as well as by ranch and dairy lands on the east side, with several small communities on both east and west shores.

Lagunitas, Olema and Walker Creeks make up the greater Tomales Bay watershed. Lagunitas Creek watershed, the largest in the county, drains 103 square miles of west central Marin, from the headwaters on the north slope of Mount Tamalpais to the southern tip of Tomales Bay. Lagunitas Creek and its tributaries, including San Geronimo Creek, Devil's Gulch, and Olema Creek, provide prime habitat for coho salmon, steelhead, and California freshwater shrimp. The watershed has supported up to 10% of California's remaining coho salmon runs, approximately 500 fish, though numbers have dropped precipitately over the past few years. The first eight miles of Lagunitas Creek are dammed for municipal drinking water (21.5 sq. mi. of watershed) by the Marin Municipal Water District (MMWD), as the creek flows through a series of reservoirs to Peters Dam at Kent Lake. Land uses in the watershed are primarily residential, parklands, and grazing lands. Olema Creek, which also supports coho, steelhead, and shrimp, flows northwest along the San Andreas Fault and discharges into Lagunitas Creek near its mouth. Olema Creek runs through areas of grazing, horse stables, and parkland.

The Walker Creek watershed is 73 square miles, mostly in northwestern Marin County, with a small portion in Sonoma County. It flows north-northwest and discharges into Tomales Bay near its northern end, close to the mouth of the Bay. The predominant land uses in this watershed are agriculture and grazing. The northern landscape of the lower watershed has open, low, rolling hills, while the upper watershed has rugged canyons. The creek is considered protected habitat by the U.S. Fish and Wildlife Service for coho salmon, steelhead, and California freshwater shrimp. California Department of Fish and Game has initiated a project to reintroduce coho salmon into the watershed, using broodstock from Olema and Lagunitas Creeks.

On the southern coast, Redwood Creek flows from Mt. Tamalpais through Muir Woods National Monument and discharges into the Pacific Ocean at Muir Beach. Redwood Creeks is also a significant coho salmon and steelhead spawning creek. There is currently a major creek restoration project underway at Muir Beach, the mouth of Redwood Creek, by the National Park Service. Easkoot Creek in Stinson Beach and Pine Gulch Creek in Bolinas are small coastal streams containing steelhead. Both of these watersheds are heavily used for recreation, including beach visits, hiking, birding, and horseback riding.

Bolinas Lagoon, located at the southern end of the Point Reyes Peninsula, is another significant Pacific Coast estuary. In 1998, the Lagoon was designated a Wetland of International Importance by the United States Fish and Wildlife Service in 1997, the only wetland along the

west coast of the continental U.S. outside Alaska to be so designated. A total of 447 species of birds, fish and other animals make their home here. The lagoon covers 1,100 acres and is a critical link in the chain of wetlands along the Pacific Coast flyway where migratory birds can feed and roost before moving on. More than 24,000 water birds, such as loons and grebes, and 20,000 shorebirds, including sandpipers and long-billed curlews, visit each year. The lagoon also serves as a nursery for about 200 harbor seals, one-fifth of California's harbor seal population, who use the lagoon to rest, molt, warm themselves and give birth to some 50 pups each spring.

Significant Watershed Issues and Water Board Activities in East Marin

One of the major issues we see in all of Marin County is that of preserving and restoring the integrity of stream systems, including removing the many barriers to fish passage. In eastern Marin, significant water quality issues include wetland and creek modifications associated with new development and flood control, including an ongoing discussion on a proposed extension of the existing flood control project on Corte Madera Creek and a major erosion control project on Novato Creek. Other issues include restoration of tidal and seasonal wetlands, e.g., Hamilton AFB, Petaluma River, and Bel Marin Keys, including the need to incorporate wetland goals from the Baylands Ecosystem Goals Report (1999) into watershed priorities. Water Board staff have commented on these efforts and closely followed planning and design of these projects as they are developed to the permitting stage.

Other potential pollutant issues in east Marin are impacts on San Francisco Bay from pollutants from marinas, houseboats, and boatworks, and pollutant discharges and dredging impacts from recreational lagoons adjacent to creeks and San Francisco Bay. There is also residual intertidal and subtidal sediment contamination from boat building activities during World War II along the Sausalito waterfront in Richardson Bay. Richardson Bay is listed on the 303(d) list of impaired waterbodies for pathogens and a pathogen TMDL was adopted by the Board in December 2009. Richardson Bay has been listed as a federal No Discharge Zone for vessel sewage waste since 1979. All of the eastern creeks in Marin are included on the 303(d) impaired waterbody list for pesticides, including diazinon. In both eastern and western Marin, potential pollution from equestrian facilities is also an area of focus, primarily by the County of Marin.

The County has an active countywide stormwater program (Marin County Stormwater Pollution Prevention Program or MCSTOPPP) that has a creek and watershed awareness focus and has been doing creek assessments in several eastern Marin creeks, including an ongoing bioassessment monitoring program. The County program is working on urban runoff control issues, and a large focus of the next few years will be on continued implementation of Phase II stormwater permitting, which began in 2004. MCSTOPPP also worked on the County's pesticide reduction program as part of the Water Board's pesticide TMDL for San Francisco Bay.

Marin completed an update of its General Plan in 2007, with the theme of "Sustainable Marin". The General Plan process also includes developing watershed plans for East and West Marin. In the past few years, the County has developed a countywide watershed program, which is discussed in more detail in the Watershed Groups and Watershed Management Efforts section below.

Significant Watershed Issues and Water Board Activities in Coastal South and West Marin

Water bodies in west Marin on the 303(d) list are Tomales Bay (nutrients, sediments, pathogens, and mercury), Lagunitas Creek (nutrients, sediments, and pathogens), and Walker Creek (nutrients, sediment, and mercury). Impacts from sediment are also documented in Bolinas Lagoon. Water Board staff have completed a pathogen TMDL for Tomales Bay (September 2005) and mercury TMDL for Walker Creek (September 2008) and are currently working on a sediment TMDL for Lagunitas Creek watershed.

Tomales Bay

In response to the passage of the state Shellfish Protection Act in 1993, which designated Tomales Bay shellfish beds as threatened by rainfall-related coliform levels, the Water Board established the Tomales Bay Shellfish Technical Advisory Committee, to determine remediation measures for the shellfish growing areas. Potential coliform sources include dairies and other confined animal facilities, grazing animals, on-site sewage disposal systems, small wastewater treatment facilities, and recreational use (i.e., boat discharges). In May 1998 there was an outbreak of Norwalk virus, a human pathogen, when approximately 170 people fell ill from eating Tomales Bay oysters. This public health crisis has led to increased focus on remediating on-site systems, providing sanitary facilities for boaters, and outreach to homeowners and visitors. Water Board staff are currently working with the Shellfish TAC and other partners in the watershed on pathogen TMDL implementation activities related to pathogens, including looking at options to designate Tomales Bay as a Federal No Discharge Zone for vessel wastes. The Gulf of the Farallones National Marine Sanctuary has been working with other federal and state agencies (including the Water Board) to develop a Vessel Management Plan for Tomales Bay, which would address all types of vessel wastes as well as mooring issues.

In response to the pollution threats to Tomales Bay, a group of stakeholders that includes local community members, agencies, environmental groups, shellfish growers, and dairy producers, came together in January 2000 to form the Tomales Bay Watershed Council. The Council completed the Tomales Bay Watershed Stewardship Plan in July 2003, which identifies goals and objectives for the watershed and an action plan. The Council succeeded in hiring a part-time coordinator, and the Council received a grant from the State Water Board under Proposition 50 to develop an Integrated Regional Watershed Management Plan (completed in June 2007) and another Proposition 50 grant to develop a long-term trend and source area monitoring program, which was begun in the summer of 2007.

The National Park Service developed a plan for restoration of 563 acres of wetlands on the Giacomini Ranch at the mouth of Lagunitas Creek. Water Board staff were very involved in the initial design stages of these projects through technical advisory committees and stakeholder workgroups. The project was successfully completed, and the wetlands opened to tidal action in October 2008. Since that time the wetlands have shown a large increase in use by fish, invertebrates, birds, and marine mammals, exceeding even initial expectations. Water Board staff will continue to be involved through post-project monitoring and follow-up, including a proposed pedestrian bridge that has been the subject of some controversy due to potential environmental impacts.

The County Environmental Health Services is beginning to address water quality concerns of creek pollution from on-site sewage systems through assessments of pollutant impacts in unincorporated rural areas and exploration of potential remediation strategies. The County received a Proposition 13 coastal nonpoint source grant in 2002 to assess Tomales Bay systems and develop a pilot remediation program, including potential construction of community on-site sewer systems. The community system along the Marshall shoreline was completed in 2008, and the County is seeking funds to expand the system to additional households.

As noted above, in September 2005, the Regional Board adopted the pathogen TMDL for Tomales Bay, which establishes numeric water quality targets for Tomales Bay and its tributaries and laid out an implementation plan and schedule for meeting these targets. The TMDL resolution, staff report, and implementation plan are available at

<http://www.waterboards.ca.gov/sanfranciscobay/TMDL/tomalesbaypathogenstmdl.htm>

Implementing these TMDL actions related to dairies, grazing management, boating, shellfish harvesting, and on-site sewer systems, will be the focus of Water Board activities over the next several years. In July 2008 the Water Board adopted a conditional waiver of WDRs to regulate grazing lands in the larger Tomales Bay Watershed. The goal of the Grazing Waiver is to reduce the amount of sediment, nutrients, pathogens, and mercury in Tomales Bay and its tributaries, by requiring landowners and operators to implement appropriate management measures (MMs) on grazing lands. As of late 2010, over 85% of ranchers had complied with waiver conditions. We continue to work on ensuring full compliance with the waiver and work with other partners in the watershed to address all sources of pathogens to Tomales Bay and its tributary streams.

Walker Creek Watershed

Walker Creek is listed as impaired for nutrients, siltation, and mercury and is also considered impaired by exceedances of coliform. The abandoned Gambonini mercury mine is located east of Tomales Bay on a tributary to Walker Creek as this area was a major source of mercury-laden sediments to Walker Creek and Tomales Bay. The major source of mercury loading in the Walker Creek Watershed is from the Gambonini Mine, which was operated from the 1960's to the early 1970's. Although mining ceased in 1972, the waste containment structure, which consisted of an earthen dam built across a steep canyon channel, was not adequate. It failed catastrophically in the winter of 1982, inundating the surrounding floodplains below the dam with mercury-laden waste. Data indicate that the mercury mine waste polluted Walker Creek to its terminus at the Walker Creek delta in Tomales Bay.

The Gambonini Mine site was cleaned up and stabilized in 2000 through a U.S. EPA Superfund action. Mine site remediation focused on minimizing the runoff of mercury-laden sediment from the former mine site by using a combination of geotechnical engineering, re-vegetation, bio-stabilization, channel reconfiguration, and runoff control techniques to isolate the mining waste from stormwater. Site remediation successfully cut off the source of the mercury-laden sediment to downstream receiving waters. Data demonstrate that legacy mining waste at the terminus of Walker Creek, the Walker Creek Delta, is being buried by cleaner surface sediments.

The Grazing Waiver discussed above implements the Tomales Bay pathogens TMDL, Walker Creek mercury TMDL (adopted by the Board in 2007), and is expected to serve as an early

implementation action for the Walker Creek sediment and the Tomales Bay mercury, nutrients, and sediment TMDLs that are under development. For property owners of 50 acres or more who graze cattle along Walker Creek, the Grazing Waiver requires ranchers to incorporate grazing management practices that minimize mercury discharges and methylmercury production. The primary goal of the Grazing Waiver for this part of the watershed is to keep cattle out of the creek to prevent remobilization of mercury-laden sediment previously deposited on floodplains and overbanks.

Landowner assistance with the identification and implementation of best management practices (e.g., fencing, bank stabilization, off-channel water sources, road repair, wet crossings, etc.) within the Walker Creek watershed is being carried out by the Tomales Bay Grazing Land Partnership through grants awarded to the Marin County RCD and Point Reyes National Seashore. Grant fund sources include state and federal funds, including Proposition 13, CWA 319(h) and Cleanup and Abatement account funding. Monitoring has been done by the Water Board, SWAMP, and OEHHA (and the Tomales Bay Watershed Council).

Additionally, in 2008, the Water Board imposed requirements on the Marin Municipal Water District (District), the owner and operator of Soulajule Reservoir. We required the District to submit a monitoring and implementation plan and schedule by 2009 to: 1) characterize fish tissue, water, and suspended sediment mercury concentrations in the reservoir and Arroyo Sausal Creek and 2) develop and implement methylmercury production controls necessary to attain both in-reservoir and downstream TMDL targets.

It appears that previous and current actions— Gambonini mine site cleanup and restoration and Tomales Bay Watershed Grazing Waiver implementation actions—are sufficient to address mercury in Walker Creek and Tomales Bay, and we plan to continue monitoring to ensure that mercury concentrations continue to decrease.

Additionally, the California Department of Fish and Game (CDFG) began a program to restore coho populations to Walker creek through the release of coho from Olema Creek and reared in their conservation hatchery. Water Board staff will continue to work with CDFG and local stakeholders in this effort.

Lagunitas Creek Watershed

As noted above, Lagunitas Creek and tributaries are significant coho salmon and steelhead habitat. The creek is listed as impaired for sediments, nutrients, and pathogens. The reduced flow from the MMWD reservoirs has dramatically altered stream flows, thereby affecting aquatic habitat. A reduction in the magnitude and timing of peak flows can delay or prevent coho and steelhead migration and lead to an accumulation of sand and fine gravels that impair fish habitat due to a lack of flushing flows. Additionally, large woody debris (LWD), an essential habitat component for salmonids, is retained behind the dam. *Order # WR 95-17: Lagunitas Creek* from the State Water Resources Control Board (1995) delineates provisions to protect coho salmon, steelhead, and California freshwater shrimp, including flow and sediment requirements, LWD placement, and monitoring of turbidity, dissolved oxygen, and water temperature.

MMWD was also required to produce and implement a sediment and riparian management plan and a fisheries management plan for the reach between Peters Dam and Tocaloma. MMWD completed the management plans in June 1997 and has been implementing them since then under the guidance of the Lagunitas Creek Technical Advisory Committee, which includes Water Board staff. MMWD is currently in process of working to prepare a new Fisheries Management Plan to succeed the recently completed 10-year plan mandated by the State Board. Water Board staff are closely involved in plan review.

Ongoing monitoring is conducted by MMWD to determine the success of their restoration program in mitigating the potential effects of the dam. However, this monitoring program does not address all of the necessary issues. Therefore, the Marin Resources Conservation District (RCD), working with the Tomales Bay Watershed Council, secured funding through a Proposition 13 grant to conduct a limiting factors analysis in Lagunitas Creek for salmonids and freshwater shrimp. Water Board staff managed the contract and worked closely with the Council, RCD, MMWD, and state and federal parks on this effort, to help inform the TMDL work on Lagunitas Creek. A stakeholder group (Lagunitas Advisory Group, or LAG) was formed to oversee the limiting factors analysis. Water Board staff are also working closely with the LAG to secure additional funding for the full scale assessment that is necessary to determine the appropriate management actions to restore the watershed and complete the TMDLs. Water Board staff also managed a grant to the County of Marin to do a sediment study on San Geronimo Creek, to improve fish passage on selected tributaries, and reduce sediment inputs from roads and trails.

A local environmental group, the Salmon Protection and Watershed Network (SPAWN) works with volunteers to monitor San Geronimo and Lagunitas Creeks, conduct outreach, and implement salmonid rescue efforts. SPAWN is carrying out sediment reduction projects related to roads as part of a Prop. 50 grant to ABAG (Association of Bay Area Governments).

A recent focus of Water Board effort has been in providing technical input in developing the San Geronimo Salmon Enhancement Plan by Marin County, which was adopted by the County Supervisors in February 2010 (information is at www.marinwatersheds.org). The Plan is a science-based approach to developing riparian and stream protection measures for new and existing development. In 2011, the County obtained funding from CDFG and the Coastal Conservancy to implement a landowner Assistance Program to work with local landowners to identify priority sites for creek remediation and restoration and develop site-specific designs. Water Board staff is working closely with these partners to review project sites and work with permitting them. Staff will continue to provide outreach and technical information to local homeowners and the County as this project proceeds into the implementation phase.

Southern Marin Watersheds

Redwood Creek and the remnant lagoon at its mouth at Muir Beach are the focus of a planning and design process by the Golden Gate National Recreation Area and the County of Marin, which have been assessing the alternatives for restoring the creek to some form of its historic channel and lagoon configuration. Water Board staff sat on an interagency technical planning and design committee and will continue to be closely involved in the ongoing permitting process

and implementation oversight. The Park Service began initial construction on the project in the fall of 2009, and the project is expected to continue for the next few years.

Easkoot Creek restoration project (270 meters, approximately 2 acres) includes both long and short-term actions to improve habitat conditions, including the restoration of the natural floodplain and pool habitats adjacent to Stinson Beach. Water Board staff were involved in both planning and permit efforts. There has also been a major assessment underway for Bolinas Lagoon under the auspices of the Marin County Open Space District, which owns and manages the major part of the lagoon and surrounding land. The foremost resource management issues for Bolinas Lagoon are the continuing sediment accumulation and loss of estuarine habitat. Following a feasibility study by the U.S. Army Corps of Engineers to determine alternatives for restoring the lagoon's tidal prism, the County decided not to proceed as planned with a large dredging project due to uncertainties and concerns about both the need and effects of dredging, which were expressed by numerous agencies, environmental groups, and community members. The County of Marin and the Bolinas Lagoon Technical Advisory Committee has begun a revised study process to determine the existing conditions and projected effects of alternative actions.

Other significant water quality issues in west Marin County watersheds include road erosion, hill and gully erosion and impacts to stream corridors, runoff from confined animal facilities (dairy and horses) and ranches, and on site sewage systems. The County has been an active participant in the six county FishNet 4C program, which works with county governments to develop ways in which county governments can be more responsive to fishery concerns. Water Board staff have worked closely with the FishNet 4C and County staff, and we see this as a landmark effort to work with local government to protect the beneficial uses of the fish bearing streams in both east and west Marin areas.

Watershed Groups and Watershed Management Efforts

Currently, there are watershed management projects in progress in many watersheds throughout the County. These projects are led by the Marin Resource Conservation District, local community groups, volunteer monitoring groups, and the County of Marin. Water Board staff participate in meetings, provide technical support, and oversee grants.

As noted above, Water Board staff participated in a Technical Advisory Committee (TAC) to work with the Tomales Bay Watershed Council, which was funded through a Proposition 50 Integrated Coastal Watershed Management Plan to develop a comprehensive plan for coastal Marin County from Tomales Bay to Bolinas. The project included an assessment of water quality impacts on four Areas of Biological Significance, assessment and mapping of stormwater networks in west Marin, and a septic education and outreach program that will be focused on developing community-based solutions. The TAC provided technical review of all work products and reports, informed and approved methodologies, and helped establish review criteria and objectives.

Working with the Marin County creek coordinator, our staff has developed a process for reviewing hydromodification projects through a monthly Marin Project Coordination meeting,

where project applicants can meet with the permitting agencies such as CDFG and the Army Corps in order to review projects, discuss design changes, and share technical information. This project has worked well to improve project designs and ensure more environmentally sound projects and coordinated permitting. We hope this may become a model for other areas of the Region.

In west Marin, we also worked with the Marin RCD, NRCS, and Sustainable Conservation to develop a permit coordination process for rural landowners. This effort has been a collaborative one in which the permitting agencies have agreed to a process to jointly review and comment on designs for a number of clearly defined stream, riparian, and land management practices to improve habitat and water quality. This process ensures that landowners will be able to get permits in an expedited, facilitated fashion, regulatory agencies are able to have their concerns addressed, and projects are completed in an environmentally sound way. The RCD has acted as the lead agency for CEQA and permitting; funds have come through Proposition 13, Coastal Conservancy, Proposition 50, EPA 319(h) and CDFG grants, with local landowner match.

In response to severe flooding in January 2006, the County Public Works Department has initiated a watershed management program to coordinate flood management and habitat restoration for Marin’s creeks. The goal is to develop watershed management plans for each of Marin’s watersheds. The pilot effort will be in the Ross Valley (Corte Madera Creek) Watershed and initial watersheds will include Novato Creek, Miller Creek, Corte Madera Creek, Arroyo Corte Madera, San Geronimo Creek, and Easkoot Creek. The County will be hiring two new employees and will be seeking grant funding.

Marin County Public Works Department also initiated an ambitious, comprehensive web-based Watershed Program in 2008, which includes maps, watershed histories, watershed assessments, land use information, and planning tools. The program can be viewed at www.marinwatersheds.org.

The following table summarizes some of the local community-based watershed efforts underway in Marin County:

Watershed	Lead(s)	Activities
Corte Madera Creek	Friends of Corte Madera Creek Watershed, Marin County Stormwater Program	Watershed plan, fisheries study, sediment study, bioassessment, flow monitoring
Arroyo Corte Madera del Presidio (Mill Valley)	Mill Valley StreamKeepers, Marin County Stormwater Program	Public education, creek assessment, bioassessment.
Lagunitas Creek	Marin Municipal Water District (MMWD), RWQCB, CA Fish & Game, Marin County, State Parks, National Park Service, SPAWN (Salmon Protection and Watershed Network)	Sediment and riparian corridor management plan, fisheries, Giacomini Ranch wetlands restoration. Grants for limiting factors, sediment budget, erosion control projects, volunteer

Watershed	Lead(s)	Activities
		monitoring.
San Geronimo Creek	MMWD; Salmon Protection & Watershed Network (SPAWN)	Sediment management plan, fisheries assessment restoration, education.
Miller Creek	The Watershed Project, Marin County	Watershed assessment, bioassessment.
Novato Creek	Marin County; Friends of Novato Creek	Watershed assessment, bioassessment,
Redwood Creek (Muir Woods)	National Park Service	Watershed assessment, Restoration planning, Restoration projects completed (Banducci property) and underway (Big Lagoon at Muir Beach), volunteer monitoring.
Bolinas Lagoon	Bolinas Lagoon TAC; Marin County Open Space District	Feasibility studies on impacts of sedimentation on the lagoon, general issues
West Marin Watersheds, Olema Creek, Pt. Reyes	National Park Service	Coho salmon studies/restoration.
Tomales Bay	Tomales Bay Watershed Council (local stakeholders, Marin RCD, County, agency representatives)	Watershed plan developed, monitoring program, ICWMP prepared
Hamilton Wetlands	Coastal Conservancy; US Army Corps	Tidal wetlands restoration underway
North Bay Watersheds in Marin, Sonoma and Napa Counties	North Bay Watershed Association, a consortium of water agencies, stormwater and local government	Developing regional watershed planning and assessment and implementing projects
North Bay Watersheds	North Bay Watershed Council	Meets in conjunction with NBWA to develop project ideas and workplan
North Bay Watersheds, Marin, Sonoma, and Napa Counties	North Bay Watershed Network, leads: Sonoma Ecology Center, Napa County RCD	Promotes cooperation and coordination among community-driven stewardship and watershed groups

Proposed RWQCB Staff Workplan for FY 2010/11 and 2011/12

- Oversee countywide stormwater program including reviewing MCSTOPPP's annual report, conducting annual stormwater program audits of each municipality, and supporting MCSTOPPP's equestrian technical assistance program
- Work with County on ongoing implementation of Phase II stormwater permitting
- Take action on 401/404 certifications and WDRs, using stream circular guidelines and working with the County and Marin Permit Coordination group to promote biotechnical bank stabilization techniques
- Work with the National Park Service on a variety of stream and wetland restoration projects, providing technical input and permitting – including Big Lagoon restoration
- Continue dairy compliance program, with potential equestrian facility outreach and inspections
- Conduct annual sampling of Richardson Bay for pathogens (houseboat and marina areas)
- Reissue NPDES and Waste Discharge Permits as needed
- Conduct annual compliance inspections for NPDES and WDR permit holders

Tomales Bay Watershed Activities

- Work with Marin RCD and Sustainable Conservation to implement permit coordination process for restoration projects on agricultural lands
- Work with MMWD on implementing roads and sediment reduction projects, large woody debris MOU, and fisheries management plan
- Continue ongoing post-remediation Gambonini mine site monitoring and assessment and downstream monitoring; implementation actions for mercury TMDL in Walker Creek Watershed
- Oversee Shellfish Technical Advisory Committee and develop Tomales Bay shellfish contamination source identification and remediation strategy in conjunction with pathogen TMDL; work with other agencies to develop federal NDZ strategy
- Continue Tomales Bay pathogen TMDL monitoring
- Continue implementation of Tomales Bay Grazing Waiver
- Manage 319(h) grants to Marin RCD, UCCE, and National Park Service on projects related to implementation of grazing waiver through monitoring and installation of management practices on grazing lands.

Program Implementation by RWQCB staff working with local partners

- Participate on Lagunitas Creek Technical Advisory Committee
- Review Bolinas Lagoon Technical Advisory Committee sediment study products as needed
- Work with National Park Service, Coastal Commission, and others on vessel management in Tomales Bay
- Work with National Park Service on design and implementation of creek and lagoon restoration activities on Redwood Creek at Muir Beach
- Work with multi-agency, multi-stakeholder Redwood Creek Watershed Assessment Project to prioritize the most important conservation actions in this watershed.
- Work with Marin RCD and other partners on implementation of grazing management WDR, including through 319(h) funded grants to Marin RCD to develop ranch plan template and implement selected management measures on grazing lands

- Grant management for MMWD 319(h) funded projects for sediment management along Lagunitas Creek and with SPAWN on Prop 50 funded project for sediment reduction projects in San Geronimo Valley
- Work with local landowners and County on implementation of San Geronimo Salmon Enhancement Plan
- Work with Tomales Bay Watershed Council on long-term and source area watershed monitoring and Giacomini wetland restoration and monitoring as part of Prop 50 grant
- Work with other agencies on finalizing Vessel Management Plan for Tomales Bay (Gulf of the Farallones National Marine Sanctuary and State Lands Commission lead)

High Priority Projects for Grant Funding

- Implement Management Practices (MPs) according to ranch water quality plans (RWQPs) (grazing and dairy waiver requirements) as part of Tomales Bay pathogen TMDL implementation.
- Water quality monitoring in Tomales Bay, including West Shore, East Shore, and tributaries, to identify specific pathogen sources, including septic and animal waste (i.e. grazing/horse ranch facilities) that will lead to prioritizing actions for source reduction.
- Tomales Bay: pollution source analysis, development of best management practices for sediment, pathogens, nutrients, and metals, implementation of monitoring program, implementation of grazing WDR waiver requirements
- Projects to implement measures to address pollutant impacts from septic systems.
- Miller, Novato, and Corte Madera Creeks: development of watershed plans and implementation of sediment budget study recommendations; watershed monitoring
- Comprehensive watershed analysis and restoration plans to protect threatened and endangered salmonids: Lagunitas Creek, San Geronimo Creek, Olema Creek, and Redwood Creek, including projects to restore anadromous salmonid access to and from high quality spawning and rearing habitats.
- Purchase of existing wetlands and diked baylands for restoration on San Francisco Bay
- Assessment and remediation of on-site sewage systems in South and West Marin
- Programs that develop and implement water quality and fisheries habitat protection plans for farms and ranches in coastal and North Bay watersheds.

Figure 3-3. Marin County Watersheds



3.5 NAPA WATERSHED MANAGEMENT AREA

Overview

The Napa River Watershed (approximately 430 square miles) is the portion of western Napa County within the San Francisco Bay Water Board's jurisdiction; eastern Napa County (approximately 360 square miles) is in the Central Valley Regional Board's jurisdiction. The Napa River, a significant freshwater tributary to San Francisco Bay, runs 55 miles from Calistoga to San Pablo Bay, with the lower 17 miles being estuarine. Numerous tributaries enter the main stem from the mountains that rise abruptly on both sides of the valley. The Napa River watershed is largely rural and agricultural, with several fast growing urban areas including the City of Napa and City of American Canyon. The largest community, Napa, has a population of 72,585 (2000 census). Major land cover types in the watershed are forest (35%), grassland/rangeland (23%), and agriculture (19%). Approximately two-thirds of agricultural land is in vineyards (13% of total area). Developed land—residential, industrial, or commercial—accounts for approximately 8% of the watershed (Association of Bay Area Governments, 2000).

The Napa River and its numerous tributaries support steelhead, federally listed as a threatened species, and the California Freshwater Shrimp (*Syncaris pacifica*), listed as endangered by state and federal government. The beneficial uses of the river include: Cold Freshwater Habitat, Warm Freshwater Habitat, Fish Spawning, Fish Migration, Preservation of Rare and Endangered Species Habitat, Wildlife Habitat, Municipal and Domestic Water Supply, and Recreation. The extensive marshlands bordering the lower river teem with hundreds of thousands of migratory birds during the fall and spring and host two endangered species, the California clapper rail and the salt marsh harvest mouse.

The watershed supplies 85% of the county's total water demand through its ground and surface water production. The cities of Calistoga, American Canyon, Napa and Yountville also receive water from the State Water Project. Wastewater discharges to the Napa River occur during the wet season only; during dry months 100% of wastewater flows are reclaimed.

Significant Water Quality Issues

TMDLs

The Napa River Watershed is on the 303(d) list for nutrients, pathogens, and siltation. TMDLs have been developed for pathogens (adopted by the Board in 2006 and approved by the State Water Board and U.S. EPA) and sediment (adopted by the Board in September 2009 and under review by the State Board and EPA). A TMDL for Napa River nutrients is under development.

Pathogen TMDL: The Water Board adopted a TMDL for pathogens in the Napa River Watershed in November 2006. The major sources of pathogens were determined to be 1) On-site sewage disposal systems (OSDS or septic systems), a significant but localized source, 2) Sanitary sewer systems (sewer lines), also significant and localized, 3) Municipal runoff, which is widespread, 4) livestock grazing, 5) Confined animal

facilities. Municipal sewage treatment plants are considered a potential source in case of spills or poor management, and wildlife is a source that is not considered significant. The TMDL sets density-based load allocations for each of these categories and outlines implementation measures and implementation parties for each source category.

Implementation is through a variety of regulatory and non-regulatory actions, including general waste discharge requirements (WDRs) or WDR waivers from the Water Board, NPDES permits, city and county stormwater programs, and OSDS evaluations and remediation activities by the County. The Water Board has currently been focusing on developing a waiver of WDRs for grazing lands for Napa and Sonoma Counties, based on the model program initiated in the Tomales Bay Watershed in Marin County. This Waiver was adopted by the Board in September 2011. See

http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/grazing/index.shtml for more information.

Water Board staff, in cooperation with local stakeholders, will also be monitoring and evaluating compliance with TMDL targets. More information is available on the Water Board website at

http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/napariverpathogentmdl.shtml

Sediment TMDL: The Water Board adopted a TMDL for sediment in the Napa River Watershed in September 2009. The TMDL focuses on sediment reduction and habitat enhancement with the goals of conserving the steelhead trout population, establishing a self-sustaining Chinook salmon population, enhancing the overall health of the native fish community, and enhancing the aesthetic and recreational values of the river and its tributaries. The TMDL concludes that major sources of sediment are from land use activities, including roads, human-caused channel incision, vineyards, intensive historical livestock grazing, and urban stormwater runoff.

The TMDL sets numeric targets for spawning gravel permeability and streambed scour and for sediment load and percent of natural background and lays out implementation actions for each source category. A large emphasis will be on working with landowners and other stakeholders on channel restoration and habitat enhancement projects, as well as using some of the regulatory tools (WDRs, waivers) noted above. In 2011-12 Water Board staff will be developing a waiver for Vineyards: for more information, see:

http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/vineyard/index.shtml

Napa River Flood Control Project

After years of major flooding, the U.S. Army Corps of Engineers developed a standardized channel flood control project in 1965, which was rejected by Napa County voters in 1976 and 1977. A serious flood in 1986 created a new impetus to develop a flood control project, but local watershed stakeholders and resource agencies came together to develop a community consensus on a “living river” project to counteract the Corps proposal. In 1998 the voters of Napa County passed Measure A, a parcel tax to implement this “living river” plan.

The “Living River” design has been described as a new paradigm for flood protection projects in the United States. “Living River” principles include reconnecting the river to its historic flood plain; maintaining the natural slope and width of the river; allowing the river to meander as much as possible; retaining natural channel features like mud flats, shallows and sandbars; and supporting a continuous fish migration and riparian corridor along the river. To achieve these objectives, old dikes have been breached to restore tidal marshlands; bridges are being replaced to remove obstacles to water flow; riverbank terracing is creating more room for large volumes of water; a dry bypass channel will provide a shortcut for the river during high flood flows while sustaining the natural oxbow habitat; new dikes, levees and floodwalls will be built; bank stabilization will be used in specific areas; and detention basins and pump stations will accommodate runoff behind the floodwalls.

The project began in 2000 and will include changes to six miles of the Napa River through the town of Napa and below to the wetlands along San Pablo Bay. The project will include removal of 53 mobile homes, 16 other residences and 23 commercial buildings; creation of 400 acres of emergent tidal marsh and 150 acres of seasonal wetlands; and replacement of nine bridges. To date about 650 acres of farmed seasonal wetland and farmed upland are being converted to wetlands, mudflats, and upland woodlands; marsh and floodplain have been created; pollutants removed along previous highly industrialized areas adjacent to the river; floodwalls built along the riverfront in downtown Napa; several bridges replaced; and a number of building revitalization projects completed along the river. Future work will include an Oxbow Bypass Channel, replacement of two railroad bridges, and completion of floodwalls. Although funding for the project has come from the Measure A sales tax and some federal funding, the project has taken longer than anticipated due to a number of years of cutbacks in federal funding. In mid-2009, the project received a large amount from the 2009 federal stimulus funds, which will put the project back on track after a number of years of scarce federal funding.

Watershed Groups and Watershed Management

WICC (Watershed Information Center and Conservancy)

Many local, state and federal agencies are involved in watershed protection efforts in the Napa River Watershed. The Napa County Board of Supervisors convened a Napa River Watershed Task Force (NRWTF) in December 1998. This task force was comprised of local citizens selected for their expertise and their ability to represent the views of interest groups within the Napa County community as well as numerous agencies including the Regional Board, Natural Resources Conservation Service (NRCS) and the Napa County Resource Conservation District (RCD). The Task Force reached consensus on a number of specific recommendations regarding the County's zoning regulations, particularly the Conservation Regulations, and the Napa County Board of Supervisors unanimously approved these recommendations on May 18, 1999, as part of Phase I of this project.

In September of 2000 the Napa River Watershed Task Force released its Phase II Final Report. Two of the recommendations resulting from this multi-year study were the

formation of a Watershed Information Center and of a Conservancy; the joint Watershed Information Center and Conservancy (WICC) was created in May 2002 by resolution of the Board of Supervisors. The overall goals for the WICC are to enhance partnerships and collaboration among watershed stakeholders, protect and enhance watersheds and natural processes, and provide environmental and information to support community efforts to understand and protect County watersheds through an interactive website portal.

The WICC is designed to guide and support community efforts to maintain and improve the health of Napa County's watershed lands, through voluntary and collaborative efforts. It currently acts as a clearinghouse and web portal for watershed groups, data and report repository, map source, calendar of events, funding coordination, and information source, among other functions. In 2007 the WICC received a grant from CalFed to develop watershed health indicators. For more information, see <http://www.napawatersheds.org>.

Napa Resource Conservation District (RCD)

The Napa RCD has been a leader in many aspects of Napa County's watershed management activities. Their efforts have lead to successful implementation of many community based water quality projects, creek and river restoration projects, and establishment of nearly a dozen watershed stewardship groups.

<http://www.naparcd.org/>

Local Stewardship Groups

Napa County has been a leader in development of watershed stewardship groups, spearheaded by the Napa RCD outreach efforts and grant projects.

Watershed Projects

Rutherford Reach Restoration:

The Napa River Rutherford Reach Restoration Project is comprised of a 4.5-mile reach of the mainstem Napa River south of the City of Saint Helena between Zinfandel Lane and the Oakville Cross Road, comprised of approximately 40 parcels owned and managed by 29 different private entities. Historic changes in land use and management in the Napa River watershed have resulted in confinement of the river into a narrow channel, loss of riparian and wetland habitats, accelerated channel incision and bank erosion, and ongoing channel degradation.

The Napa River Rutherford Reach Restoration is a landowner-initiated project that aims to reduce existing bank erosion and enhance riparian and aquatic habitats using a suite of approaches, including: setting back earthen berms from the top of the river bank; creating vegetated buffers between the river and adjacent land uses; excavating and planting inset floodplain benches; creating backwater habitat to provide high-flow refugia for native fish; removing non-native invasive and Pierce's disease host species; planting native understory species; installing biotechnical bank stabilization to stabilize actively eroding banks; and, installing instream structures to improve aquatic habitat. The project also includes an annual maintenance program to proactively address debris, bank erosion, and inputs of fine sediments and to maintain the functions of the restoration features.

Water Board staff have worked closely with this project, managing several 319(h) grants for several of the Project's phases and working with the project director and DFG on developing a comprehensive monitoring program. Further project information is available at http://www.napawatersheds.org/app_pages/view/228

Oakville to Oak Knoll Reach:

In 2007 the California Land Stewardship Institute (CLSI) received funding from the California State Water Resources Control Board and Napa County (Measure A) to prepare an enhancement plan for nine miles of the Napa River between the Oakville Cross Road bridge and the Oak Knoll Avenue bridge. This plan was completed in 2010 and project proponents will be looking for implementation funding. CLSI has also applied for 319(h) funds to prepare a restoration plan for the upstream portion of the Napa River. This project would complete a plan for 4.6 miles of the Upper Napa River to address channel erosion, a fine sediment source identified in the Napa River Fine Sediment TMDL. Staff are also part of a Technical Advisory Group for these efforts.

Summary of Significant Issues

Urban Runoff

- Impacts from new development

Stream and Wetland Habitat Protection

- Need for comprehensive baseline watershed assessment
- Alteration of flow regime due to water diversions and flood control levees and channelization leading to:
 - a) dry season streamflow reduction by surface water diversions and groundwater extraction

- b) peak flows during wet season potentially increases flooding and stream bank failure
- c) flooding and associated flood management practices
- Development and loss of wetlands south of Napa in the airport industrial area.
- Loss of riparian habitat due to farming practices and vineyard conversions

Impacts from Pollutants

- Impairment in the Napa River and tributaries due to siltation, nutrients, pathogens, and possibly dissolved oxygen, high temperature, and eutrophication, impacts in the Napa River.
- Wastewater discharge impacts on surface water and groundwater.

Program implementation by RWQCB staff and local partners

- More active response to major development plans by RWQCB staff
- More effective implementation of California's NPS Program Management Measures by RWQCB, local agencies, and land owners.
- More effective leveraging and oversight of grants
- Stormwater program improvements through review and comment on annual reports

Staff Workplan for FY 2010/11 and 2011/12

- Oversight of Phase II Stormwater Program
- Take action on 401/404 certifications
- Continue work with Napa RCD and other stakeholders on creek restoration and enhancement projects as part of grant management and/or technical advisory committee participation
- Ongoing participation in implementation of the Napa Living River Flood Management Project:
 - Reissue NPDES and Waste Discharge Permits as needed
 - Implement WDR waiver for grazing lands
 - Develop WDR waiver for vineyards
 - Manage 319(h) grants to County of Napa for Rutherford Reach restoration projects
 - Manage 319(h) grant to County of Napa to continue creek restoration and enhancement projects along a two-mile stretch of the Napa River as part of Rutherford Project
- Implement pathogen and sediment TMDL measures in addition to those noted above
- Pursue enforcement against estimated erosion, construction project, or illegal fill violators
- Take other enforcement action as needed

High Priority Projects for Grant Funding

- Develop and implement sediment control and habitat enhancement actions. Specifically, develop third party or technical assistance programs to assist with farm/vineyard plan development and implementation.
- Develop RWQPs and implement MPs for grazing lands. Develop third party or technical assistance programs to assist with RWQP development and implementation.
- Sediment control and habitat enhancement actions identified in Napa River Sediment Reduction and Habitat Enhancement Plan (TMDL).

November 2011

- Sediment and restoring in-stream channel complexity as called for in Sediment TMDL SEP: Develop plans for restoration of the Upper Napa River in reaches that have not yet been addressed.
- Implement reach-scale projects to restore stream-riparian habitat complexity and connection to floodplains, and to balance fine and coarse sediment budgets.
- Channel incision adaptation project and restoration of fish passage at Zinfandel Lane Crossing to address impacts of channel incision on habitat access and sediment transport dynamics.
- Road erosion control and prevention projects for rural lands
- Baseflow monitoring and related education and outreach projects to protect key tributaries for steelhead
- Salmonid population monitoring and modeling
- Implementation of vineyard erosion best management practices
- Study of groundwater discharge effects on stream recharge and temperature
- Evaluation of pesticide use and water quality monitoring

3.6 SAN FRANCISCO WATERSHED MANAGEMENT AREA

At the center of our Region, both geographically and symbolically, is the City and County of San Francisco (the City), which share the same boundary. Located at the tip of a narrow 46.7 sq mi. peninsula, San Francisco County is bounded by the Pacific Ocean to the west and by San Francisco Bay to the north and east. With a population of approximately 776,700 (2000 census), San Francisco is the most densely developed of the Region's nine counties. Northeast San Francisco is the most developed, with commercial downtown high-rises and apartment buildings. The southeastern part of the City is largely industrial and residential, with limited open space. The eastern shoreline is largely developed and devoted to maritime and industrial uses, some of which are obsolete. Accordingly, there are numerous redevelopment projects along the shoreline. The west side of the City is predominately residential, but also features large open spaces including Golden Gate Park, Lincoln Park, the Golden Gate National Recreation Area (which encompasses the Presidio, Ocean Beach, and Fort Funston), Lake Merced, and several golf courses surrounding the lake. The County also includes Treasure Island and Yerba Buena Island in San Francisco Bay, which belong to the U.S. Navy (Treasure Island is in the process of being transferred to the City as part of the base closure program), and Alcatraz Island, formerly the site of the notorious federal prison and now part of the State Park system. The City also has several other base closure sites (Hunter's Point, the Presidio) where land is being turned over for redevelopment, with attendant issues of toxic cleanups, groundwater remediation, and redevelopment.

San Francisco is unique in the region in several significant ways: 1) although the City has several large groundwater aquifers, it relies completely on imported surface water from Hetch Hetchy reservoir in the Sierra Nevadas, 2) most of San Francisco has a combined sanitary sewerage and storm water collection system and outfalls (CSOs), 3) the County is almost completely built out and has a very high proportion of impervious surfaces and therefore lack of groundwater recharge areas, and 4) there are virtually no stream systems left in the County, with the exception of some bayside tidal sloughs (Mission Bay, Islais Creek, Yosemite Creek) and a few small lakes and streams within the Presidio and other parks.

Elevated levels of nitrates are the most pervasive groundwater quality problem in San Francisco, with fertilizers and leaking sewers as potential sources. Other water quality issues include toxic cleanups at former military bases, potential water reclamation and groundwater reuse, impacts associated with redevelopment projects on the base sites and along the southeast shoreline, stormwater impacts from non-CSO areas of the City, and direct discharges into San Francisco Bay from shoreline areas. Staff has increased industrial inspections along the shoreline piers and will also be working with the City on Phase II permitting for these areas and other non-CSO parts of the City. Recently, San Francisco County has completed both groundwater and reclaimed water master plans that reflect the goal of diversifying water supplies. There has also been increasing focus on Lake Merced, an important wildlife habitat and recreational area in the southwest corner of the City, since water diversions to nearby golf courses and other uses have had severe impacts on the lake. San Francisco and San Mateo Counties have been working on solutions to the problem, including the possibility of diverting stormwater from the

combined sewer facilities in that area or using reclaimed wastewater for irrigation rather than taking water from the lake. Regional Board staff will be actively involved in reviewing any of these proposals for potential impacts on beneficial uses.

Another major issue in the City and County is the proposed large scale expansion of the San Francisco airport, which would require extensive bay fill. Although the airport is within the County of San Mateo, the City of San Francisco owns and operates the airport facilities and is of course involved in all decision-making. Staff will be part of any pre-project review and permitting activities relating to the airport.

Groundwater Resources

The City is considering further development of its groundwater resources. Current groundwater usage in the City is primarily for irrigation of parks and golf courses. San Mateo County withdraws groundwater for potable uses, resulting in declining water levels of Lake Merced. Seven groundwater basins (Westside, Lobos, Downtown, Marina, Islais Valley, South and Visitation Valley basins) occur beneath the City, delineated and separated on the basis of bedrock ridges and topographic divides. The Lobos, Marina, Downtown and South Basins are contained wholly within the City limits. The Islais Valley Basin extends beneath Daly City, Visitation Valley extends beneath the City of Brisbane, and the Westside Basin extends south of the City across several political boundaries (the Cities of Daly City, Colma, South San Francisco, San Bruno, and Millbrae) past the San Francisco International Airport. Westside Basin is the most promising basin in terms of groundwater development. It is the largest basin in San Francisco in areal and vertical extent, and composed primarily of course-grained materials. Groundwater in the southern portion of the Westside Basin and Lobos Basins is already used for potable purposes and is routinely sampled and analyzed for compliance with drinking water standards; therefore, the groundwater in these basins is considered potable.

Groundwater in the northern portion of the Westside Basin is also considered potable based on limited historic data and preliminary sampling results obtained in 1993; however, the data indicates that occasional concentration of nitrates, chlorides, iron, total dissolved solids, and fecal coliform have been detected above drinking water standards. Downtown Basin groundwater is being considered for nonpotable uses only (i.e., toilet flushing, irrigation, and climate control) because of the historic industrial development and the density of identified hazardous waste sites. Groundwater within the remaining basins (Marina, Islais Valley, South and Visitation Valley Basins) have not yet been fully assessed. The City's Water Department will need to address several technical and institutional issues (i.e., saltwater intrusion, subsidence, leakage from leaking tanks and sewer utilities, etc.), before utilizing groundwater for potable uses.

San Francisco Groundwater Beneficial Use Designation Project

In 1996, the Regional Board's staff Groundwater Committee completed a report titled "San Francisco and Northern San Mateo County Pilot Beneficial Use Designation

Project, Draft Staff Report.” This effort included a comprehensive evaluation of hydrogeology, future groundwater uses, and alternatives for revised beneficial use designations. The results are summarized below and incorporated into the Basin Plan Amendments available at:

http://www.swrcb.ca.gov/%7Erwqcb2/basin_plan_ammend.htm.

- The Basin Plan should be amended to include more recent information regarding the boundaries and beneficial uses of groundwater basins on the San Francisco Peninsula.
- The MUN beneficial uses should be de-designated for the Downtown Groundwater Basin and Treasure Island.

A prioritization map for groundwater management is shown in Figure III-6.

Significant Watershed Issues

- Military base conversion at Hunter’s Point, Treasure Island, and the Presidio, and associated water quality concerns related to storm water, groundwater contamination, and redevelopment
- Stormwater runoff contamination leading to Phase II permitting for non-CSO areas of San Francisco, including federal and state facilities
- Water quality impacts of fish processing and other facilities along the waterfront of the Port of San Francisco
- Beach closures due to coliform contamination at Baker, China, Ocean and Ft. Funston beaches; beaches proposed for 303(d) listing as impaired waterbodies
- Contaminated sediments in Islais, Mission, and Yosemite Creeks
- Wetland restoration and associated toxic hotspots
- Caltrans construction of new Bay Bridge and associated stormwater runoff pollutants, wetland impacts, and impacts to Yerba Buena Island
- Ground water contamination and associated reclamation and potential drinking water concerns
- Re-development projects at Mission Bay, Treasure Island, Ferry Terminal, Port of San Francisco, and the Presidio
- Protection of Beneficial Uses and water reclamation at Lake Merced
- Increasing contaminant levels of PAHs in dredge sediments from yearly dredging at Piers 33 and 35 by the Port of San Francisco
- Exotic species in nearshore waters of San Francisco and wetland restoration sites

Proposed Workplan for FY 2004/05 and 2005/06

- Review and comment on the Port of San Francisco stormwater program
- Stormwater inspections for fish processing facilities, boatyards, and other waterfront areas; request and review stormwater management plans
- Development of a municipal storm water permit under Phase II for non-combined sewer system areas, including Lake Merced and the Port of San Francisco
- Staff review of Presidio treatment plant and reclamation proposal

- Hunter's Point ecological risk assessment for offshore sediments; records of decision for groundwater remediation
- Treasure Island ground water extraction and TPH remediation; review proposals for redevelopment; review dredging proposals
- Implementation of proposed 303(d) listing for beach closures
- Review of dredging proposals by the Port of San Francisco
- Take action on approximately 20 anticipated 401/404 permits
- Reissue NPDES Permits as necessary (see Appendix A, Sections 1-3 for schedule)
- Complete pretreatment compliance inspections (see Appendix A, Section 4 for schedule)
- Conduct annual compliance inspections for NPDES major and minor permit holders (see Appendix A, Section 5 for schedule)
- Review of San Francisco airport expansion proposals and pre-project permitting activities

High Priority Unfunded Activities

- Study the effects of CSO on the sediments and water surrounding the outfalls
- Increased monitoring and assessment of potential contaminants, including the use of marine mammal testing
- Beach monitoring
- Development of a Wellhead Protection Program

High Priority Projects for Grant Funding

- Best Management Plan for Fish Handling Facilities
- Best Management Plan for Marinas and Piers
- Monitoring of beaches to address closures and remediation
- Education and outreach activities

3.7 SAN MATEO WATERSHED MANAGEMENT AREA

Overview

San Mateo County is located on a broad peninsula south of the City and County of San Francisco, bordered on the east by San Francisco Bay and on the west by the Pacific Ocean (Figure III-5). The County, which includes 20 cities and 17 unincorporated communities, covers about 450 square miles; according to the U.S. Census Bureau, the 2008 population estimate is about 712,700 people. The County is separated into the eastern and western corridors by the San Mateo Range, which runs north/south through the county on its western side. To the east of the range lies the flat, more densely urbanized and industrial area along San Francisco Bay, where the large majority of the population is concentrated. Approximately 50% of the western part of the county is in parklands and open space (including 11 state parks and 12 state beaches), with the rest in agricultural and urban use, the latter primarily concentrated in the northern part of the County in Daly City and Pacifica and around Half Moon Bay about a third of the way down the San Mateo coast. About 26 percent (74,300 acres) of the county's total 285,000 acres is considered urbanized. The San Francisco Bay Regional Board has jurisdiction over all of eastern San Mateo County and all of western San Mateo except the small portion of the coast south of the Pescadero-Butano Creeks Watershed.

Watershed Descriptions

San Mateo County encompasses a wide variety of habitats including estuarine, marine, oak woodland, redwood forest, coastal scrub and oak savannah. There are numerous species of wildlife present, especially along the San Francisco Bay shoreline, San Bruno Mountain in Daly City, Fitzgerald Marine Reserve on the coast, and the forests on the Montara Mountain block. Several creeks discharge to the San Francisco Bay including San Mateo Creek, Laurel Creek, and San Francisquito Creek (the border with Santa Clara County). On the coastside there are a number of significant coastal watershed areas including San Pedro Creek, Pilarcitos Creek, San Gregorio Creek and Pescadero-Butano Creeks.

The County is home to several endangered species including the San Francisco garter snake and the San Bruno elfin butterfly, both of which are endemic to San Mateo County. The endangered California clapper rail is also found on the shores of San Francisco Bay, in the cities of Belmont and San Mateo. The endangered wildflower Hickman's potentilla is found near the Pacific Ocean on the lower slopes of Montara Mountain. The endangered wildflowers White-rayed pentachaeta, *Pentachaeta bellidiflora*, San Mateo Woolly Sunflower, *Eriophyllum latilobum*, Marin Dwarf Flax, *Hesperolinon congestum* and the San Mateo Thornmint, *Acanthomintha duttonii*, are found in the vicinity of the Crystal Springs Reservoir. Coastal creeks are home to endangered steelhead and coho salmon.

Significant Watershed Issues

San Gregorio Creek, Pescadero Creek and San Francisquito Creek are listed as impaired water bodies on the 303(d) list for sediment due to degradation of salmonid habitat. All

three water bodies support steelhead trout runs. Steelhead trout are Federally-listed as threatened in central California. Coho salmon are still thought to be present in Pescadero and San Gregorio Creeks, and these basins are listed as top priority streams in Department of Fish and Game's Coho recovery plan for streams south of the Golden Gate. Coho salmon are State-listed as endangered (south of the Golden Gate) and Federally-listed as threatened in central California. National Marine Fisheries Service staff has stated that the risk of extinction of Coho salmon south of the Golden Gate is higher than for almost any other run of salmonids on the west coast (S. Kramer, personal communication). The San Mateo County coast is the one of the last remaining accessible, rural coastlines next to a major metropolitan area in the nation, and scientists have designated the area a biodiversity "hotspot," a place rich in biodiversity and threatened by urban development.

Pilarcitos Creek watershed is a significant environmental resource, rich in native plant and animal species and identified as critical habitat for the recovery of Steelhead trout (federally listed as threatened). Dams, diversions, and loss of habitat due to channelization and rural and urban residential, agricultural, and commercial influences have significantly altered Pilarcitos Creek. Loss of riparian habitat, migration barriers, sedimentation of stream channels, proliferation of non-native vegetation, and competition for water between agricultural, domestic and environmental uses are principal problems in the watershed.

We have prepared a workplan to establish and implement Total Maximum Daily Loads for sediment to address potential sediment problems in the listed creeks. Of vital importance in this effort is the initiation of holistic watershed assessments to determine whether sediment is actually a major factor limiting salmonid populations or whether watershed disturbances are of equal or greater importance as limiting factors (e.g., water diversion, reduction in large woody debris loading, stream temperature, etc.). A number of stakeholder forums have been established in the west county watersheds as part of locally initiated Coordinated Resource Management Planning (CRMP) processes.

The coastal waters of San Mateo County are within the Monterey Bay National Marine Sanctuary. This presents opportunities for collaboration with other water resource protection efforts, such as the Sanctuary's Agricultural Initiative. Pescadero Creek watershed has been selected as a pilot basin for initial implementation of the Agricultural Initiative in San Mateo County; these efforts hold tremendous promise if they can be effectively implemented. In addition, the San Mateo Stormwater Pollution Prevention Program (STOPPP) effort is being expanded to provide baseline watershed inventory and assessment information in the San Francisquito Creek watershed. We are currently working with the San Francisquito Joint Powers Authority (JPA), which includes representatives from the Santa Clara Valley Water District, San Mateo County Flood Control District, and the cities of East Palo Alto, Menlo Park, and Palo Alto, to address water quality and flood control issues within the watershed. The JPA has received a Proposition 13 grant, and we have formed an inter-disciplinary Technical Advisory Committee to initiate a sediment budget study of the watershed.

San Mateo County has implemented a confined animal waste ordinance that has reduced pollution from horse boarding facilities. San Mateo County and the town of Portola are currently considering adopting creek setback ordinances.

On July 21, 1999, the Regional Board reissued an NPDES permit for San Mateo Countywide Stormwater program (twenty cities and towns and unincorporated areas). The permit requires reduction of pollutants in stormwater discharges to the maximum extent practicable and the elimination of unauthorized non-stormwater discharges. It also requires reduction of pollutants that cause or contribute to violations of water quality standards. The permit requires the permit holders to implement Stormwater Management Plans (the Plans), which specify the measures that are needed to control pollutants in stormwater. The Plans consist of a series of pollution control activities designed to identify and implement control measures to reduce, if not eliminate, pollutants in storm runoff to the maximum extent practicable and to demonstrate compliance with water quality objectives in receiving waters. STOPPP is required to submit annual report(s) that include evaluation of the effectiveness of the Best Management Practices and Performance Standards for each pollutant control measure. Furthermore, STOPPP is required to identify types of activities that need improvements and implement them accordingly. STOPPP is also required to evaluate sources and loadings, as well as management measures, for pollutants including diazinon, PCBs, and mercury.

Watershed Groups and Watershed Management Efforts

Currently, there are watershed management projects in progress in many watersheds throughout the County, led by local community groups, the San Mateo County Resource Conservation District, Mid-Peninsula Open Space District and others. Water Board staff participate in meetings, provide technical support, and oversee grants.

Watershed	Lead	Activities
San Francisquito Creek	San Francisquito JPA	CRMP, volunteer monitoring nutrient pollution assessment, flood management planning, riparian planting
Pilarcitos Creek	Pilarcitos Restoration Workgroup, San Mateo Co RCD, State Water Resources Control Board	Integrated Watershed Management Plan (Oct. 2008)
Pescadero/Butano Creeks	San Mateo Co RCD Monterey Bay National Marine Sanctuary	Watershed assessment, sediment budget, creek stabilization
San Gregorio Creek	San Mateo Co. RCD	Mainstem channel restoration near mouth

Significant Issues

Urban Runoff

- Stream and wetland impacts from new development
- Water quality impairment from pesticide runoff
- Water quality impacts from industrial and commercial facilities and illicit discharges

Stream and Wetland Habitat Protection

- Declining steelhead and Coho salmon habitats in coastal streams.
- Uncertainty in current stream conditions due to a lack of watershed assessment data
- Degrading stream quality from rural road erosion
- Water quality impacts from proposed San Francisco Airport expansion wetland fill
- Declining water levels in Lake Merced

Impacts from Pollutants

- Beach pollution and closures from sewage overflows
- Creek pollution by nutrients from horse stables
- Water quality impacts from coastal agricultural facilities, including irrigation runoff, fertilizer and pesticide discharges, and habitat impacts on tributary creeks

Program Implementation by RWQCB staff and local partners

- Regulating water quality compliance at new Pacifica wastewater treatment facility
- Groundwater management of the Westside Basin
- More effective implementation of California's Nonpoint Source Program Management Measures by RWQCB, local agencies, and land owners.
- More effective leveraging and oversight of grants
- Gain stormwater program improvements through critical review of annual reports
- Technical assistance and support for county planning and public works staff (streambank ordinance, rural road maintenance standards, CEQA review)

Proposed RWQCB Staff Workplan for FY 2010/11 and 2011/12

Urban Runoff

- Oversee San Mateo County Urban Runoff Program including: review annual report, conduct annual audit, and assist with runoff issues associated with construction and new development, participate in technical advisory committee meetings.
- Amendment municipal storm water permit to include revised new development standards

Stream and Wetland Habitat Protection

- Review and approve or disapprove applications for 401 water quality certifications, approximately 50 applications per year.

Impacts from Pollutants

- Reissue NPDES and Waste Discharge Permits
- Complete pretreatment compliance inspections
- Conduct annual compliance inspections
- Resolve outstanding issues with major NPDES permits
- Implement TMDL workplan components

Program Implementation by RWQCB staff and local partners

- Oversee 319(h) grants for Pescadero Creek and Apanolio Canyon

- Oversee Proposition 13 grant for San Francisquito Creek
- Oversee Pilarcitos Creek restoration
- Take enforcement actions as needed

High Priority Unfunded Activities

- Enforce water quality violations from horse stable operations
- Review and comment on timber harvest plans
- Review of CEQA documents
- Document and follow-up on suspected septic systems discharges into creeks during storm events that lead to beach closures
- Assist in implementing strategies from Agricultural and Rural Lands Action Plan published by the Monterey Bay National Marine Sanctuary

High Priority Projects for Grant Funding

- Limiting factor analysis of San Francisquito Creek watershed
- Watershed assessments to confirm or reject siltation/sediment listings, and determine whether there are other causes for impairment (e.g., riparian impacts, flow depletion, nutrients)
- Implement initial restoration and management actions in impaired watersheds
- Establish stakeholder forum(s) and watershed management plans to promote proactive problem solving by local entities. Include priority listing of actions needed to resolve watershed disturbances, and initial recommendations for salmonid recovery
- Facilitate multi-agency coordination and consolidation of Endangered Species Act (ESA) and Clean Water Act (CWA) mandates

3.1 SANTA CLARA WATERSHED MANAGEMENT AREA (Santa Clara Basin)

The Santa Clara Basin (Figure 3-7) encompasses the extreme South Bay (south of the Dumbarton Bridge) and those areas of Santa Clara County that drain to the South Bay, including the eastern slope of the Santa Cruz Mountains, the Santa Clara ("Silicon") Valley, and the western slope of the Diablo Range. Within Santa Clara County, the Basin consists of eleven watersheds including the Coyote Creek watershed on the east side of the valley, the Guadalupe River watershed which drains the south-central portion of the valley, the southern half of the San Francisquito Creek watershed on the western boundary of the Basin, a series of small, relatively urbanized watersheds that drain the remainder of the west side of the valley, and the Baylands.

The Basin has a population of approximately 1.7 million, and is mostly urbanized, with some agricultural uses in the rural upper watershed areas. It is one of the fastest growing counties in California.

Water Quality and Aquatic Beneficial Use Issues

Wastewater discharges into San Francisco Bay from the Silicon Valley have been an ongoing issue for Board staff. The discharge from the San Jose/Santa Clara wastewater treatment plant goes into historic salt marshes in the South Bay. The discharge has caused conversion of portions of the salt marsh to brackish marsh, which is significant since two endangered species rely on the salt marsh habitat. In response to this the Board has required mitigation for converted habitat and adopted the "South Bay Action Plan" to limit flows from the treatment plant. The Action Plan includes reclamation, conservation, and environmental enhancement projects.

Santa Clara County has more than 700 miles of creeks and rivers (Figure III-7). Agricultural and urban development have encroached into the original floodplains of many reaches of most of these streams. Reduced floodplains in combination with increased runoff from development have increased erosive forces of streams, resulting in increased soil erosion in some locations and increased soil deposition in others. The various types of development have reduced riparian vegetation which historically provided increased channel stability, shading, instream habitat cover, and a food source for aquatic invertebrates. Flood management channel modifications, both concrete and earthen, have, in most instances, eliminated natural floodplains, instream habitat, and riparian vegetative canopy. Urban stormwater runoff has increased the pollutants discharged to the streams. These impacts have not been uniformly distributed throughout all streams. Some reaches of some streams, especially, though not exclusively, in the upper undeveloped areas of the watersheds, have retained sufficient value to sustain fisheries and riparian habitat.

The Basin includes the region's most significant groundwater resource, the Santa Clara Valley. The boundary of the Santa Clara Valley groundwater basin is the contact

between valley fill and the bedrock formations at the surface and beneath the fill. The aquifers of the Santa Clara Valley consist of 1) the forebay, 2) upper aquifer zone, and 3) the lower aquifer zone. The Santa Clara Basin receives its major recharge in the forebay from stream infiltration, applied irrigation water, and percolation ponds. Most of the groundwater pumped from the basin is from the lower aquifer zone. Groundwater supplies approximately 50% of the potable water supply for the residents of the Santa Clara Valley. The other 50 % comes from imported water that is stored in surface reservoirs along with local rainfall and runoff.

Groundwater is extremely important to the Santa Clara Valley and protection of this resource is therefore very important. Industrial and agricultural activities have contributed to the degradation of the groundwater in some parts of the Santa Clara Valley. Pollutants that contaminate shallow groundwater have found their way into the deeper drinking water zones through a combination of leaky aquitards and numerous improperly abandoned wells. Development in the Basin margins has removed large portions of the recharge area from the hydrogeologic regime. This has a two-fold effect on the regions groundwater. First it reduces the amount of surface area available for water to infiltrate into the aquifers and secondly it places potentially polluting activities in the recharge area.

Several water bodies in the Santa Clara Basin have been designated under Section 303(d) of the Clean Water Act as impaired due to certain pollutants. These include South San Francisco Bay for copper, nickel, mercury, selenium, diazinon, polychlorinated biphenols (PCBs), dioxins, furans, dieldrin, chlordane, and DDT. Urban creeks (Calabazas, Coyote, Guadalupe, Los Gatos, Matadero, San Francisquito, Saratoga, and Stevens) have been listed for diazinon. Water bodies in the Guadalupe River watershed (Guadalupe River, Alamitos Creek, Guadalupe Creek, Calero Reservoir, and Guadalupe Reservoir) have been listed for mercury. San Francisquito Creek has been listed for excessive siltation (sediment) These and other possible listings and progress towards their resolution and will be reviewed as part of update of the 303(d) list due April 2002. Resolution of impairment includes development of TMDLs. TMDLs are currently being developed (see Appendix A, Section 8) for copper and nickel in South San Francisco Bay, mercury, and PCBs in San Francisco Bay as a whole, diazinon in urban creeks, mercury in the Guadalupe River watershed, and sediment in San Francisquito Creek.

In response to the many water quality and aquatic beneficial use problems in the county, considerable local effort is underway in addressing a wide range of issues: wastewater disposal and reuse, urban runoff pollutant reduction, wetland fill impact avoidance and mitigation, watershed assessment and action planning, TMDL development, ecologically-sensitive flood management project design, and development of comprehensive multi-year water quality and watershed health monitoring.

Santa Clara Basin Watershed Management Initiative

We initiated our watershed management effort in the Santa Clara Basin in the summer of 1996 with a series of stakeholder focus group meetings at which we solicited

stakeholders' interests relative to watershed management in the Basin. The community embraced this opportunity to accept responsibility for local stewardship of the watershed and created the Santa Clara Basin Watershed Management Initiative (WMI). This WMI is a broad-based stakeholder group of 32 signatories from local, state and federal public agencies, business and trade associations, and civic and environmental groups and programs. The declared purpose of the WMI is " to develop and implement a comprehensive watershed management program - one that recognizes that healthy watersheds mean addressing water quality problems and quality of life issues for the people, animals and plants that live in the watershed." The WMI has established a mission statement, goals, planning objectives for development of the watershed plan, implementation objectives, and a framework for conducting a watershed assessment. Also, stakeholder forums for development of TMDLs have been established for copper and nickel in Lower South San Francisco Bay, mercury in the Guadalupe River watershed, and sediment in San Francisquito Creek.

The WMI is committed to implement a watershed management planning process for the Santa Clara Basin that integrates the following issues:

- habitat and water quality protection and enhancement;
- water rights and water supply reliability;
- flood management;
- regulatory compliance;
- land use; and
- public awareness and involvement.

The Workplan for the WMI includes preparation of 3 volumes: (1) Watershed Characteristics, (2) Watershed Assessment, and (3) Watershed Action Plan. The Watershed Characteristics Report was published in February 2001. The Watershed Assessment for 3 pilot watersheds is anticipated in draft in February 2002. The Watershed Action Plan is completing preliminary planning early in 2002 and is expected to be completed in December 2002. The Watershed Plan will be based on sound science with broad stakeholder involvement and will integrate existing programs and identify what needs to be done to reduce and prevent pollution and provide for effective land use and waterway management. The comprehensive stakeholder process will be used to reach agreement on the Plan, its priorities and long term implementation.

We are promoting the following eleven actions as desired outcomes of watershed management efforts:

1. Implementation of a comprehensive watershed assessment strategy that identifies problems or otherwise establishes steps to resolve unknowns;
2. Implementation of a comprehensive watershed assessment strategy that identifies sources of problems or otherwise establishes steps to resolve unknowns;
3. Implementation of a comprehensive watershed assessment strategy that identifies solutions of problems or otherwise establishes steps to resolve unknowns;
4. Long-term resolution of municipal wastewater permit issues;
5. Long-term resolution of San Jose/Santa Clara wastewater discharge flow cap issues;

6. Resolution of urban runoff (municipal stormwater) permit issues;
7. Establishment of basis for Basin Plan Amendments (includes consideration of site specific objectives);
8. Assessment and resolution of 303(d) impaired water body listings and development of a phased TMDL (initial priorities are copper and nickel in South San Francisco Bay, mercury in the Guadalupe River and sediment in San Francisquito Creek);
9. Establishment of a streamlined 404 permit/401 certification process for stream and wetlands fill and dredging projects;
10. Implementation of the Urban Runoff Permit stormwater treatment and hydrograph modification requirements for new development and redevelopment projects; and
11. Development/implementation of a Stream Protection Program to prevent further degradation of stream habitats and associated non-support of aquatic habitat beneficial uses.

The first ten of these outcomes were identified by Regional Board staff in 1997. The tenth outcome has been modified slightly to reflect the current status of the Urban Runoff Permit provisions. The eleventh outcome has been added to reflect the emerging focus on stream functions in relation to beneficial use protection.

To date, the most outstanding successes of the WMI have been in sustaining organizational continuity and in the conducting outreach and information dissemination. After five years, the organization still continues to meet, resolve issues and produce products. Staff and volunteers of key agencies and signatory organizations continue to provide input to the WMI coordinating body and its subgroups. The outreach products have been numerous and well implemented, e.g., the WMI Vision Brochure, the Watershed Watch Media Campaign, publication of the Watershed Characteristics Report, funding of a lecture series, Santa Clara Valley Water District Landuse Summit, and watershed grants to community organizations by the Water District and City of San Jose.

The success of its watershed assessment process has been more limited. The WMI's three watershed assessments (Guadalupe, Upper Penetencia and San Francisquito), due in draft in early to mid-2002, are being prepared with existing data (rather than a result of a substantial field data collection effort), thereby initially limiting their usefulness. Nevertheless, the assessments may be useful for identifying, and creating a plan to fill, data gaps.

An important current focus of the SCB WMI is the completion of a Watershed Action Plan, targeted for December 2002. This Plan will consist of recommended actions and implementation tasks compiled from input from the various WMI subgroups.

More significant progress is being made by individual WMI member agencies rather than directly through the WMI itself. The Santa Clara Valley Water District's \$8 million 1.8 mile Guadalupe Creek Restoration project is nearing completion. Settlement of a water rights complaint in 2002 is expected to result in the Water District making commitments to significant improvements to fisheries habitat on three stream systems. The San

Francisquito Creek sediment analysis under the direction of a Joint Powers Authority is moving forward. The Water District has secured legislative approval to include stream stewardship in its mission and is reorganizing and expanding its staffing to accommodate a watershed stewardship program, including improved monitoring and further development of ecologically-sensitive flood management project design approaches. The WMI has the potential to continue to build upon these individual efforts and create a coordinated effort to implement its well articulated watershed vision.

In 2001, the WMI conducted its own self-evaluation of its performance relative to Regional Board goals and to its own internal goals and objectives and has prepared a list of its accomplishments (see its self-assessment and accomplishments contained in Appendix B). These self-evaluations reflect the depth of commitment and the seriousness of WMI participants in crafting an effective watershed management program. One aspect emphasized in these documents is the important progress in building institutional relationships which we see as laying the essential groundwork for more substantial watershed planning and improvement actions. Though these groundwork laying activities over the past five years are to be commended, it is hoped that the coming years will see a move towards the completion of more substantial watershed planning and project implementation. It is hoped that the assessments, in conjunction with current discussions shaping a five year monitoring program for the basin, will result in a data collection effort that contributes more to action planning and implementation.

The WMI is at a critical juncture in its history. It can take the assessments and lessons learned to date and step up towards the next level of commitment to robust watershed assessment and project implementation. Or it can choose to continue at groundwork laying stage and produce reports which point in the right direction but delay the hard decisions of resource commitment needed to make the WMI fully realize the purpose for which it was created. The coming two years will be pivotal in the WMI's history.

During this fiscal year, the Regional Board staff will prepare an analysis of the effectiveness of the SCB WMI process. The analysis will include "lessons learned" and the implications of these "lessons learned" for the future of the WMI and for beginning similar initiatives in other counties of the region. The analysis will also be used in dialogue with the SCB WMI and member agencies towards the end of identifying barriers to WMI effectiveness and strategies to overcome them.

Regulatory Framework

The Board's major regulatory program thrusts in the county include:

- NPDES Permits for discharges to surface water from 3 major wastewater treatment plants
- NPDES Urban Runoff Program (consolidated permit for 13 municipalities, the County and the Santa Clara Valley Water District)
- 401 Certifications and Waste Discharge Requirements for major flood management capital projects and channel maintenance projects

- 401 Certifications for other wetland/stream fill projects
- Waste Discharge Requirements for Landfills and other waste-disposal-to-land facilities
- Site Cleanup Requirements and NPDES Permits for groundwater cleanup sites
- TMDL Development, including Guadalupe River Mercury TMDL and San Francisquito Creek Sediment TMDL
- Monitoring efforts through the Regional Monitoring Program, Surface Water Ambient Monitoring Program, and Regional Monitoring and Assessment Strategy

The local Watershed Management Initiative efforts are currently without an explicit regulatory permit driver; hence, the WMI priorities tend to be driven by other programs, such as the Urban Runoff Program requirements, conditions placed on wetland fill certifications, requirements of federal and state fisheries agencies, citizen advocacy group legal actions, or internal institutional needs.

One of the major participants in watershed management activities in the basin is the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP). The Regional Board first issued an NPDES municipal storm water permit to the SCVURPPP in 1990, and reissued the permit in 1995 and 2001. The permit and the SCVURPPP seek to reduce urban runoff pollution through such programs as illicit connection and illegal dumping elimination; industrial and commercial discharge control; maintenance of streets, storm drains, and water utilities; pollutant specific control activities (e.g. pesticides, mercury, PCBs); new development planning procedures; construction inspection; comprehensive monitoring, and public information and participation.

Significant Issues

Urban Runoff

- Lack of permanent stormwater treatment and hydrograph modification management at new development/redevelopment projects
- Operation and maintenance of new development stormwater treatment measures
- Lack of comprehensive water quality monitoring program
- Erosion during construction of new development projects
- Pollution from diazinon and other urban pesticides
- Insufficient inspection/enforcement follow-up actions for industrial and illicit discharges

Channelization/Stream Maintenance/Flood Management

- Identification of sources, causes and solutions to significant sediment problems
- Continued improved stream maintenance practices and associated land use practices
- Habitat loss and sedimentation from ongoing flood management projects
- Need for new pilot programs to test innovative ecologically-sensitive multi-objective flood management design approaches

Stream and Wetland Habitat Protection

- Wetland losses at new developments
- Protection and enhancement of riparian buffers

- Improved process for stream alteration and wetland fill permits
- Protection of endangered species
- Restoration of bayland wetlands
- Lack of comprehensive local programs, policies and implementing ordinances for protecting stream habitats from further degradation

Pollutants

- Implementation of pollution prevention action plans and site specific objectives for copper and nickel
- Hg impairment in SF Bay and upland watersheds from natural sources and abandoned mines
- Resolution of potential sediment impairment
- Lack of watershed data for Guadalupe Hg and San Francisco Bay PCBs TMDL
- Lack of watershed data for dioxins and pesticides
- Lack of watershed data for potential listings (e.g., sediment, trash) and emerging issues (e.g., polydibromated ethers, endocrine disrupting substances, pharmaceutically active substances)
- Toxicity from pesticides
- MTBE, industrial solvents, and gasoline contamination in groundwater

Wastewater Discharges and Reclamation

- Reclaimed wastewater for environmental enhancement
- Mandatory enforcement activities under SB2165

Groundwater Protection

- Protection of high quality groundwater resources and cleanup of polluted groundwater
- New development in groundwater recharge zones
- Wellhead protection plans
- Potential reclamation in recharge areas

Issues from the Santa Clara Basin Watershed Management Initiative

- Regulatory streamlining
- Efficiency of the Regional Board
- Ongoing resources and funding for the WMI
- Sustainable water supply in light of explosive growth
- Better coordination of air quality and transportation regulation

Proposed Workplan for FY 2004/05 and 2005/06

Urban Runoff

- Oversee implementation of Santa Clara Valley Urban Runoff Pollution Prevention Program Permit
- Gain stormwater program improvements through thorough review of annual reports
- Implement effective monitoring program
- Assure compliance with new development/redevelopment provisions
- Implement pollutant-specific provisions (e.g., pesticides, mercury, PCBs)
- Improve followup aspects of industrial inspection program

Stream and Wetland Habitat Protection

- Review potential significant impacts prior to taking 401 certification/WDR action for: Upper Guadalupe River, Lower Silver Creek, Adobe Creek, Matadero Creek, Lower Guadalupe, Upper Penitencia Creek
- Collaborate with eight other organizations to develop integrated solutions for flood protection, habitat restoration, and community recreation on the Upper and Lower Guadalupe River
- Track implementation of comprehensive, long-term stream maintenance plans for Alum Rock Park (Upper Penitencia Creek)
- Oversee Santa Clara Valley Water District's sediment removal projects
- Review of Santa Clara Valley Water District design details for bank stabilization, outfall, cribwall, and bank grading projects
- Develop strategy to streamline processing of both WDRs and 401/404 certifications
- Review 310 acre salt pond conversion mitigation bank project and Los Capitancillos freshwater marsh mitigation project
- Take action on 401/404 certifications

Impacts from Pollutants

- Oversee NPDES Permit including: review annual report, conduct annual audit, and assist with runoff issues associated with construction and new development
- Oversee copper/nickel amended permit compliance
- Initiate Basin Plan Amendment process for Cu/Ni
- Leadership role in WMI workgroup for Hg TMDL in Guadalupe Watershed

Program Implementation by RWQCB staff

- Continue in leadership roles in the Watershed Management Initiative
- Prepare evaluation of current effectiveness of the WMI, recommendations for improving the WMI effectiveness and lessons learned for application in other counties
- Develop strategy to implement a comprehensive Stream Protection Program
- Take enforcement actions as needed
- More effective leveraging and oversight of grants

High Priority Unfunded Activities

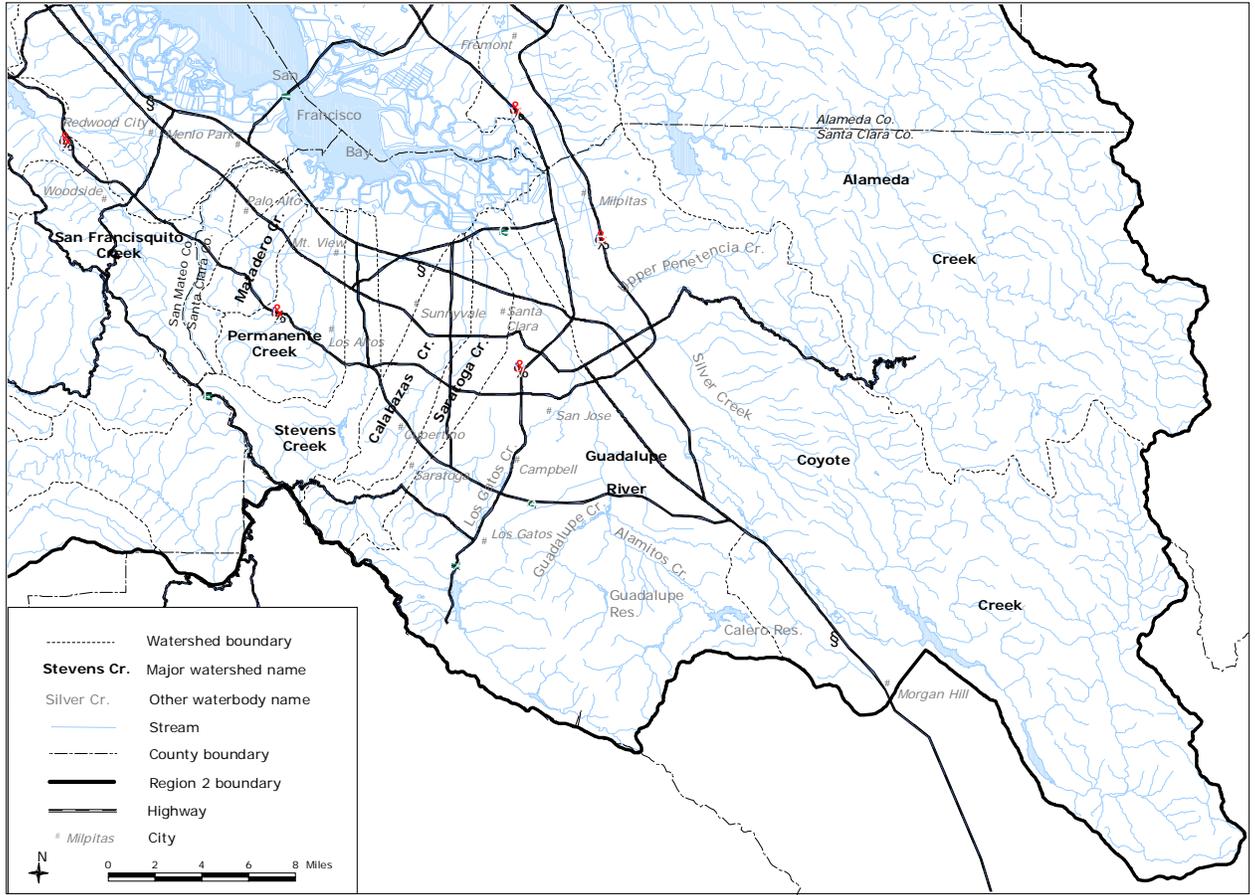
- Review of CEQA submittals

High Priority Projects for Grant Funding

- Watershed assessments to confirm or reject mercury and siltation/sediment listings, and determine whether there are other causes for impairment (e.g., riparian impacts, flow depletion, nutrients).
- Implement initial restoration and management actions in impaired watersheds.
- Support for the development of citizen monitoring efforts to characterize watershed health and identify pollutant sources
- Support for the development of public/private partnerships in watershed monitoring

- Pilot project for attaining beneficial uses in modified stream reaches (including Santa Clara Basin-wide identification and ranking of modified stream reaches with high potential for restoration of more physically and biologically natural channels.)

Figure 3-7. Santa Clara County Watersheds



3.9 SOLANO WATERSHED MANAGEMENT AREA

Overview

Solano County is the northernmost of the nine counties within the San Francisco Bay Area. The county's population of 413,344 (2010 census) is concentrated along the Interstate 80 corridor that runs generally in an east-west direction through the center of the county. Of the county's 823 square mile area, a large percentage is in agriculture, although, as with most outlying Bay Area counties, suburban development is causing a rapid decrease in farmland acreage. The landscape of Solano County ranges from flat agricultural land in the north to rolling hills in the south. Along its southern and western borders are San Pablo and Suisun Bays, the Napa River and the Mare Island and Carquinez Straits. The Sacramento River is the eastern boundary of the county. Region 2's jurisdiction in the county comprises the area that drains into San Francisco Bay and the Carquinez Straits, generally the southwestern half of the county. Figure 3-4 shows significant watersheds in the North Bay including Solano County.

Solano County has become a leader in Bay Area growth since the 1980s because it possesses some of the last remaining large tracts of easily developable land in the Bay Area. The major cities in our portion of the County are Vallejo and Benicia at its southernmost end, and Fairfield and Suisun City in central Solano County. Vallejo is the largest city in the county with a population of 115,942 (2010 census). Fairfield is the County seat and second largest city, characterized by a maturing center and new development at the fringes, surrounded by crop and grazing land. Recent construction of a new County office complex in downtown Fairfield in 2004 may help to revitalize the downtown area.

Watershed Description

In the western portion of Solano County there are large expanses of marshes, farmed wetlands, islands, sloughs and mudflats forming a crescent along the north shoreline of San Pablo Bay, anchored by Mare Island at its eastern most point. The former Mare Island Naval Shipyard currently consists of over 5,000 acres of developed areas, marshlands, and submerged lands. The shipyard was established in 1854 as the first U.S. Naval installation on the Pacific Coast. At the peak of its activity during World War II, it employed over 46,000 military and civilian personnel and was one of the major ship repair facilities for the Pacific Fleet. In the 1950's it became a building and overhaul base for submarines. The Base was downsized in the late 1980's and was ultimately closed in 1996.

Suisun Marsh in eastern Solano County is the largest contiguous brackish water marsh remaining on the west coast of North America and is a critical part of the San Francisco Bay-Delta estuary ecosystem. Encompassing 116,000 acres, the Suisun Marsh includes 52,000 acres of managed wetlands, 27,700 acres of upland grasses, 6,300 acres of tidal wetlands and 30,000 acres of bays and sloughs. It is home to public waterfowl hunting areas and 158 private duck clubs. The Marsh comprises more than 10% of California's remaining natural wetlands and is the resting and feeding ground for thousands of

<http://www.iep.ca.gov/suisun/>. The upland area of the Suisun Marsh is a 10,000 acre open space tract owned by the Cities of Benicia, Fairfield, Vallejo and the County, which is overseen by the Tri-City and County Cooperative Planning Group, responsible for preparing, adopting, revising, amending, funding, and implementing a Regional Park and Open Space Preservation Plan.

Suisun Creek Watershed drains 53 square miles in Napa and Solano counties, from the western flank of the Vaca Mountains to Suisun Marsh. Gordon Valley Dam was constructed on Suisun Creek by the City of Vallejo in 1926 for water supply. Wooden Valley Creek and its tributary, White Creek, drains a small agricultural valley and large area of wildlands to meet Suisun Creek several miles downstream of the dam. Ledge wood Creek drains approximately 21 square miles along the eastern side of Suisun Valley to Suisun Marsh. Over ninety percent of the Suisun Creek watershed is in open space, and most of it is privately owned by farmers and ranchers. The lack of development in the watershed has preserved ample habitat for wildlife, including steelhead trout (*Oncorhynchus mykiss*). Recent studies have named Suisun Creek as one of 8 “anchor” watersheds in the Bay area supporting steelhead trout habitat.

Travis Air Force Base, which occupies over 6,000 acres in eastern Solano County, is an active military base, and employs a large portion of the county residents. Established in 1943, the 5,025-acre Travis Air Force Base serves as Military Air Command Headquarters to the 22nd Air Force, as well as a medical center.

Significant Watershed Issues

- One of the major water quality issues in Solano County is the impact on creeks and wetlands from existing and proposed new development and hydromodification, particularly in upland areas with unstable and highly erodable soils. Conversions of agricultural land to housing and vineyards contribute to erosion, sedimentation of downstream waterbodies and marshes, urban runoff pollution (e.g., oils and greases) and pollution from fertilizers and pesticides.
- A major issue in Solano County has been the base conversion at Mare Island Naval Shipyard and impacts to water quality associated both with historical activities at the Base and with the current the development proposals. The base conversion plan includes over 1400 residential units, 7 million square feet of commercial office space, and various public and recreational facilities. Environmental concerns at the facility from historic activities include: landfills, underground storage tanks, oil sumps, PCBs, industrial solvents, sandblasting waste, and ordnance. Redevelopment will also require oversight of construction, stormwater controls, and stream and wetland protection.

- Aside from Mare Island, several groundwater cleanup sites in Solano County are a focus of Regional Board staff efforts, including the Benicia Arsenal and Industrial Park solvent plume, the OEA site (explosives), the Valero Refinery, IT Corporation, and Travis Air Force Base, which is a U.S. EPA Superfund site. The backfill for an underground aqueduct running through Fairfield potentially serves as a preferential migration pathway, and as such is a concern to the UST (Underground Storage Tank) Local Oversight Program. Redevelopment in and near downtown Vallejo (Brownfields), including cleanup and redevelopment of a former PG&E manufactured gas facility, and other pending development of waterfront industrial properties are also areas of concern for water quality protection and where cleanup may be required.
- Current and future areas of water quality concern include the ongoing cleanup of the Kinder-Morgan pipeline diesel fuel spill into Suisun Marsh (April 2004) and future management to prevent similar pipeline ruptures in sensitive ecological areas. Kinder Morgan recently relocated the pipeline to a corridor some distance from the Marsh, which should alleviate some of these concerns. Another issue recently brought to Regional Board attention is the discharge of nutrient-laden water from some Suisun Marsh duck clubs, which has severely lowered dissolved oxygen levels in marsh sloughs and caused fish kills. Also of interest in the County is the widespread use of biosolids and potential impacts to groundwater and surface waters. A water quality-related issue identified by local municipalities is the need for better communication and coordination among local agencies on water, sewer, and stormwater regulation and outreach.
- There are four major NPDES permits in Solano County: the Fairfield-Suisun Sewage Treatment Plant, Vallejo Sanitation treatment plant, Valero Refinery, and Benicia treatment plant. Of these, Vallejo's permit is up for renewal in 2011, Benicia's in 2013, and Fairfield-Suisun and Valero in 2014. Issues include high inflow and infiltration during wet weather.
- The cities of Vallejo, Fairfield and Suisun City have been subject to Phase I (large urban areas) stormwater permitting. The cities of Fairfield and Suisun City have joined together to form the Fairfield-Suisun Urban Runoff Management Program (the Fairfield-Suisun Permittees). The City of Vallejo and the Vallejo Sanitary District also collaborate as the Vallejo Permittees. All are now covered under the regionwide Municipal Regional Permit for Stormwater, adopted by the Board in October 2009. The remainder of Solano County is included under the statewide permit for Phase II municipalities and facilities (small cities and state and federal facilities).
- The Suisun Marsh Wetlands are designated as impaired on the 303(d) list, due to metals, nutrients, organic enrichment, low D.O. and salinity. These are considered medium-priority TMDLs at this time. In October 2001, agencies with primary responsibility for actions in Suisun Marsh formed the Suisun Marsh

Charter Group to develop an implementation plan for the Marsh. The plan will outline actions needed to preserve and enhance managed seasonal wetlands, restore tidal marsh habitat, implement a comprehensive levee protection/improvement program and protect ecosystem and drinking water quality.

A subcommittee of the Charter Group, the Suisun Marsh Regulatory Working Group, is comprised of staff from agencies with regulatory oversight responsibilities. The Regulatory Working Group is preparing a joint National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) Programmatic Environmental Impact Statement -Environmental Impact Report (EIS/EIR) for a Habitat Management, Preservation, and Restoration Plan for the Suisun Marsh. Participating agencies include the Board, Solano Resource Conservation District, U.S Bureau of Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Army Corps of Engineers, and California Department of Fish and Game. Further info on the Charter Group can be found on the Department of Fish and Game website at <http://www.dfg.ca.gov/delta/suisunmarsh/charter.asp>.

- The Air Force has identified a number of sites with contaminated soil and/or groundwater at Travis Air Force Base, some of which pose the potential for human health or ecological risk. There are a wide variety of contaminants, such as heavy metals, VOCs (volatile organic compounds), refined petroleum products and SVOCs (semivolatile organic compounds) that were intentionally or unintentionally released from historic aircraft fueling and maintenance activities. Sites of concern include: three onsite landfills, one of which contained pesticide containers but has now been cleaned up and closed, and another which has been designated as a corrective action management unit (CAMU) to receive contaminated soil from other base cleanups; four areas where combustible wastes were burned during firefighting exercises for several decades; several areas where various solvents and petroleum products were spilled; and a storm drain system that is tributary to Union Creek, which flows across the Base.

There is also a decommissioned sewage treatment plant with several abandoned oxidation ponds and sludge drying beds. A number of areas with soil and groundwater above screening levels have been identified. An extensive groundwater-monitoring program is in place, and there are three onsite treatment plants that treat extracted groundwater, some of which is discharged to Union Creek, with the remainder being reclaimed onsite. Other sites use more innovative treatment methods, or rely on monitored natural attenuation. Several soil sites have been identified as posing a risk to human health and/or the environment, including portions of the sediment in Union Creek. Following the adoption of a Record of Decision (ROD) for the soil, sediment and surface water at the majority of Travis AFB, the Air Force plans to excavate the contaminated soil starting later this year, and to dispose of this material, to the extent possible, in the onsite CAMU. Following the adoption of a Record of Decision (ROD) for

the soil, sediment and surface water at the majority of Travis AFB, the Air Force plans to excavate the contaminated soil.

- Another significant water quality issue in the Solano County portion of San Francisco Bay is the ultimate fate of over 150 surplus navy vessels, known as the “Mothball Fleet”, moored in Suisun Bay east of the Carquinez Strait. None of the vessels are in working order and many are no longer sea worthy. Many of these vessels still have bunker oil, diesel fuel, and other petroleum products in their fuel and storage tanks and could cause water quality problems in Suisun Bay if they are allowed to sink and break apart. After several years of negotiations between the U.S. Maritime Administration (MARAD) and the Water Board and other agencies, on April 14, 2011, the United States Eastern District of California Federal Court signed the proposed Consent Decree negotiated with MARAD, thereby agreeing to enforce through the court the cleanup, maintenance, and removal of mothball fleet’s 57 so-called “non-retention” vessels from Suisun Bay by 2017. The Consent Decree requires MARAD to:
 - 1) Submit a Notice of Intent to comply with the Statewide NPDES Industrial Stormwater General Permit and to submit a comprehensive pollution prevention plan, which has already been reviewed and approved by all of the parties. MARAD has completed this requirement.
 - 2) Remove the exfoliated paint from all of the ship decks. MARAD has completed this work on about 20 of the non-retention fleet’s 57 ships and has collected approximately 120 tons of paint and debris from these ships;
 - 3) By September 30, 2011, MARAD will remove all of the exfoliating paint from all horizontal and vertical exterior surfaces on the 25 vessels that are in the poorest condition; and
 - 4) By September 30, 2013, MARAD will remove the 25 worst vessels from the fleet for scrapping.

Watershed Groups and Watershed Management Efforts

There are several existing watershed efforts currently in Solano County:

Suisun Marsh Technical Advisory Committee -- Interagency committee chaired by DWR to discuss technical and water quality issues in Suisun Marsh. One of the main purposes of the Committee is to report on the operation of the Department of Water Resource’s structures in the Suisun Marsh that are used to control salinity, required under a State Board Permit. The committee reports on the monitoring of the salinity in the Marsh and other compliance points. In general, salinity has been successfully controlled by these structures. The committee also deals directly with landowners in the Marsh and the Suisun Resource Conservation District to find ways to enhance water quality and protect endangered species.

Suisun Creek Watershed Program (SCWP) – this effort was started in 2000 as a partnership between local landowners interested in protecting Suisun Creek and the California Sportfishing Protection Alliance (CSPA). These two partners combined with

elected officials, environmental and agricultural groups, resource agencies and the City of Vallejo, owner of Lake Curry, to form the Suisun Creek Restoration Team (SCRT). CSPA hired Laurel Marcus and Associates (LMA) and, in conjunction with the SCRT sought funding for a Suisun Creek Watershed Plan. They received a \$150,000 grant from the State Coastal Conservancy. The City of Vallejo also expended funds to evaluate some aspects of the watershed.

The Watershed Plan identified a number of limiting factors to steelhead habitat, water quality and beneficial uses in Suisun Creek and recommended a number of priority actions, including an analysis of potential changes to Lake Curry (a dammed lake on upper Suisun Creek in Napa County, which is a standby water supply for the City of Vallejo); eradication of the invasive plant species *Arundo donax*, *Vinca major* and *Rubus discolor* along the riparian corridor; use of “Fish Friendly Farming Program” practices on agricultural lands in the watershed; and outreach and education. In June 2004 the CSPA was awarded a \$580,000 grant by CalFed to implement these recommendations. The California Land Stewardship Institute (CLSI) with Laurel Marcus as director, now directs implementation of the watershed plan through the Fish Friendly Farming program and a grant through the Department of Conservation for a Suisun Creek Watershed Coordinator. More information is available on the Fish Friendly Farming website at: <http://www.fishfriendlyfarming.org/otherwatersheds/suisun-creek.html>.

Solano Environmental Educators (SEE)

This is a new group begun in 2011 and is comprised of educators, government, agencies, and NGOs who meet to share ideas and resources, plan partnerships, and develop and fill needs for environmental education in Solano County. More information is available at their website <http://outdoorsolano.info>.

Vallejo Watershed Alliance

The Alliance is a community-based group working together to improve the greater Vallejo watershed, which encompasses the City of Vallejo and nearby unincorporated areas of Solano County. The Alliance is made up of interested residents, local groups, and agencies, including representatives from the Vallejo Sanitation and Flood Control District, the Greater Vallejo Recreation District, the California Native Plant Society and others. Their mission is to raise awareness, create local partnerships and promote sustainable management of Vallejo’s watersheds. <http://www.vallejowatershedalliance.org/>

Proposed RWQCB Workplan for FY 2011/12 and 2012-13

- Oversee Department of Defense (DoD site cleanups, including Mare Island, Benicia Arsenal, and Travis AFB
- Oversee SLIC and UST sites
- Provide assistance on Brownfields redevelopment
- Update Vallejo Sanitation Agency NPDES permit
- Oversee stormwater programs, Phase I and Phase II
- Issue 401 water quality certifications, e.g., levee repairs in Suisun Marsh
- Oversee wetland restoration projects

- Review and address Bay margin issues, including pipeline repairs and nutrient discharges from duck clubs
- Take enforcement action as needed

Priority Activities that are Unfunded or Underfunded

- CEQA review
- Grant management
- Construction project oversight
- General plan reviews and new development project reviews
- Protection of endangered species habitat, wetlands and riparian

High Priority Projects for Grant Funding

- Implementation of management practices to reduce sediment discharges to Suisun Marsh
- Habitat restoration in Suisun Marsh and creeks
- Watershed planning efforts
- Restoration of habitat values and stream functions in Solano County watersheds that drain to the Carquinez Strait.
- Implementation of management practices to reduce sediment nutrient, or low dissolved oxygen discharges to Suisun Marsh, and habitat restoration in Suisun Marsh and its tributary creeks, Solano County.

3.10 SONOMA WATERSHED MANAGEMENT AREA

Overview

Region 2 includes the portion of Sonoma County south of the city of Santa Rosa, which contains the drainage basins of the Petaluma River, Sonoma Creek, and Tolay Creek. The northern portion of Sonoma County is located in the North Coast Regional Board's (Region 1) jurisdiction. Figure III-4 illustrates significant watersheds in the North Bay, including Sonoma County. These water bodies drain into tidal flats adjoining the north end of San Pablo Bay. The cities of Petaluma and Sonoma are within this management area. Sonoma County is one of the fastest growing counties in California. This growth is resulting in land use changes and associated environmental and water quality issues.

These watersheds support an array of land uses such as vineyards, livestock facilities, croplands, state parks and urban areas. The western part of southern Sonoma County is generally low, rolling hills. Reclaimed San Pablo tidal flats form the lower ends of the two valleys. The valley floors and adjacent hills are farmed intensively. The hills in southwestern Sonoma County are used largely for grazing dairy cattle and sheep.

Watershed Descriptions

Petaluma River

The Petaluma River and its tributaries drain an area of about 146 square miles in southeast Sonoma County and northeast Marin County. The Petaluma River proper is primarily a tidal slough extending from about the Payran Street crossing in the city of Petaluma to the confluence with San Francisco Bay. This tidal slough reach of the river flows through the extensive Petaluma Marsh which provides substantial fish and wildlife habitat and is one of the larger such habitats in San Francisco Bay.

Upstream of Payran Street the Petaluma River has very limited summer flow, but does support a good stand of riparian woodland habitat, although this is now confined to a relatively narrow corridor along the stream. From approximately the Rainsville Road crossing upstream, the Petaluma River is seasonal and supports an insignificant amount of riparian vegetation.

The northern extent of the Petaluma River watershed is dominated by the Denman Flats area to the north of the city of Petaluma. This area appears to have a strong connection between surface water and ground water. The streams in this area are all very small and ephemeral, and have poorly defined connections to the main channel of the Petaluma River, particularly during the dry season. While the upper reaches of these tributaries support some small amount of riparian vegetation, the lower reaches of the streams typically do not support riparian vegetation. These lower stream reaches flow through what appears to be an alluvial fan and the subsurface flow of the streams in this area is probably too far below the surface to support riparian vegetation. The upper reaches of the streams that flow into the Denman Flats area are mostly seasonal, but there are some reaches that have a small amount of perennial flow.

The areas to the east and west of the city of Petaluma are drained by a few small streams. On the west side of the city some of these streams support small stands of riparian vegetation. On the east side of the city, Adobe Creek, Willowbrook Creek, Lichau Creek, and Lynch Creek support good stands of riparian vegetation. Adobe Creek supports a small population of steelhead trout. A small number of juvenile steelhead has also been observed in Lynch Creek and Lichau Creek, but these streams have a very low potential to support these fish, due to extremely low summer flows.

Sonoma Creek

Sonoma Creek and its tributaries drain an area of about 170 square miles in southeast Sonoma County between the Mayacamas Mountains to the east and the Sonoma Mountains to the west. Sonoma Creek has its headwaters in Sugarloaf Ridge State Park north of Kenwood and flows through the valley through the city of Sonoma to an extensive tidal marsh before discharging into San Pablo Bay. This tidal marsh reach of Sonoma Creek provides substantial fish and wildlife habitat and is contiguous with other similar habitats in the northern part of San Francisco Bay.

Rainfall ranges from about 23 inches per year in the valley to more than 50 inches in the Sonoma Mountains to the West and the Mayacamas mountains to the east. Approximately 30 percent of the watershed is forest; agriculture (mainly vineyards) account for another 30 percent; and 20 percent is grassland and rangeland. Only 15 percent of the watershed is developed. The watershed provides habitat for several native threatened or endangered species of concern, including steelhead trout (*Oncorhynchus mykiss*), Chinook salmon (*Oncorhynchus tshawytscha*), and California freshwater shrimp (*Syncaris pacifica*). The City of Sonoma, the largest city in the watershed, has a population of 9,128.

Upstream of the town of Glen Ellen the mainstem of Sonoma Creek supports spawning and rearing habitat for steelhead trout. The upstream extent of this habitat is restricted by waterfall in Sugarloaf Ridge State Park. Downstream of Glen Ellen the creek serves as a migration corridor for steelhead, but is generally too warm in the summer for successful rearing; fish in this area are primarily native warmwater species. Several tributary streams on both the east and west sides of the valley also support populations of steelhead trout. From the upper extent of tidal influence upstream to near the Kenwood area Sonoma Creek supports a population of the endangered California freshwater shrimp.

Much of the mainstem of Sonoma Creek in the area between Glen Ellen and Kenwood is very deeply incised and the bed has scoured into thick clay layer. This probably limits the ability of steelhead or salmon to spawn.

The lower portion of the watershed flows through a large alluvial fan formed from the very large amounts of sediment that come off Sonoma Mountain to the west. Old maps show that Sonoma Creek apparently flowed through multiple paths across the broad and very low gradient valley from the city of Sonoma to the tidal marshes to the south.

This large sediment load coming off Sonoma Mountain and effect it has on valley floor stream reaches is best seen in the area where Carriger Creek crosses Arnold Drive and Watmaugh Road south of Sonoma

The areas to the east and west of the city of Petaluma are drained by a few small streams. On the west side of the city some of these streams support small stands of riparian vegetation. On the east side of the city, Adobe Creek, Willowbrook Creek, Lichau Creek, and Lynch Creek support good stands of riparian vegetation. Adobe Creek supports a small population of steelhead trout. A small number of juvenile steelhead has also been observed in Lynch Creek and Lichau Creek, but these streams have a very low potential to support these fish, due to extremely low summer flows.

Tolay Creek

Tolay Creek drains about 10.9 square miles. There are no major tributaries, but there are springs and seasonal drainage ways in the watershed. The Sears Point Raceway is located within the Tolay Creek watershed.

TMDLs (Total Maximum Daily Loads)

The Sonoma Creek and Petaluma River Watersheds support beneficial uses for cold and warm freshwater habitat, fish migration, and preservation of rare and endangered species, fish spawning, wildlife habit, and contact and non-contract recreation. In addition, groundwater is a source of drinking and irrigation water in rural areas of the county. Impacts from agriculture runoff, construction, hillside development, and urban runoff have resulted in the 303(d) listing of impaired waterbodies for Sonoma Creek and Petaluma River for nutrients, pathogens, and sediment.

The Petaluma River including San Antonio Creek are identified as impaired on the Clean Water Act Section 303(d) list. These water bodies are listed as impaired for the following constituents: Diazinon, nutrients, pathogens, sedimentation/siltation, and trash. Only the tidal portion of the Petaluma River is listed for nickel.

Sonoma Creek and Calabazas Creek are identified as impaired on the Clean Water Act Section 303(d) list. These water bodies are listed as impaired for various constituents including; nutrients, pathogens, sediment, sedimentation/siltation, and Diazinon. The Water Board adopted a TMDL for pathogens for Sonoma Creek in June 2006, which was approved by the U.S. EPA in February 2008. The Sonoma Creek sediment TMDL was approved by the Board in December 2008 and was approved by the State Water Board and EPA. A nutrient TMDL is also under development, anticipated in 2012-13.

The pathogen TMDL cites animal waste (dairies and grazing lands), human waste (on-site disposal systems (OSDS) and sanitary sewer line), and municipal runoff as the primary sources of pathogen pollutants. The TMDL proposes density-based waste load allocations for E. coli, fecal and total coliform. Implementation actions include Water Board oversight of the County of Sonoma on OSDS regulation, development of regionwide Waste Discharge Regulations (WDRs) for sanitary sewer overflows, WDRs

or waiver for dairy facilities, planned WDRs for grazing activities, and increased focus on pathogen reduction measures through the County's and City's Phase II stormwater program. The TMDL also includes ongoing monitoring for compliance and evaluation of TMDL management measure effectiveness. For more information, see our website at http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/sonoma_crkpathogenstmdl.shtml

The goals of the Sonoma Creek Watershed Sediment TMDL and Habitat Enhancement Plan (TMDL) are to: Conserve the steelhead trout population, Restore water quality to meet water quality standards, including attaining beneficial uses; enhance the overall health of the native fish community; protect and enhance habitat for native aquatic species; and enhance the aesthetic and recreational values of the creek and its tributaries. The TMDL sets targets for spawning gravel permeability, pool filling, and substrate concentration – percent fines. In order to achieve the TMDL, controllable sediment delivery resulting from human actions needs to be reduced by approximately 80 percent from current proportion of the total load. These required actions include channel erosion and incision, road and stream crossings, surface erosion (vineyards, grazing lands, etc.), and landslides. Implementation actions include vineyard management practices; grazing management; road design, construction and maintenance; and construction and industrial site management. The TMDL also includes a number of recommended actions for fishery enhancement, such as removal of fish passage barriers, channel enhancements, and maintenance of summer baseflows in streams. For more information, see the Water Board website at:

http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/sonoma_crksedimenttmdl.shtml

A large focus of Water Board staff effort in the Sonoma Creek watershed has on developing a Napa River-Sonoma Creek Conditional Waiver of Waste Discharge Requirements for grazing lands (i.e., a waiver of permit requirements based on complying with agreed-upon management practices and development of individual ranch plans) and on developing a joint Napa River-Sonoma Creek Conditional Waiver of Waste Discharge Requirements for Vineyard Facilities, which will include management practices to address road and hillslope erosion, application of fertilizers and pesticides, and so on. Staff will solicit input from stakeholders during both of these waiver development processes. The essential component of the Grazing and Vineyard Waivers will be the owner/operator's completion of a farm water quality plan (farm plan). A farm plan includes a comprehensive inventory and assessment of natural resources, agricultural lands, and management practices. The farm plan must address surface erosion, storm water runoff, sediment delivery from roads, pesticide use, nutrient management, and protection of stream areas. The grazing waiver was adopted by the Water Board in September 2011. Information on this waiver is available at http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/grazing/index.shtml

The vineyard waiver is currently under development and is expected to be completed in 2012. For more information, please see the Water Board website at

http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/sonoma_crksedimentmdl.shtml for a factsheet and status updates on the Vineyard Waiver program.

Efforts are also beginning on TMDLs for sediments and nutrients for the Petaluma River Watershed. Staff are working on an impairment assessment for the Petaluma River Watershed, developing detailed sampling plans and protocols for nutrient and pathogen impairment. Nutrient impairment is complicated by being caused by various factors and combinations of factors, so it is technically difficult. Basic sources of pollutants are anticipated to be primarily from agriculture and septic systems.

Wastewater Treatment and Water Recycling

In 2009, the City of Petaluma opened a new Waste Water Treatment and Water Recycling Facility, which can treat up to 6.7 million gallons per day (MGD); this plant replaced the old wastewater treatment plant, which had reached capacity. The Ellis Creek Water Recycling Facility treats about 5 million gallons of wastewater each day. In the winter time, highly treated wastewater is introduced back into the Petaluma River. During the summer, the recycled water is introduced into the City's recycled water system and used for irrigation of agricultural lands, two golf courses, and a vineyard. The City annually produces about 600 million gallons of recycled water.

The Sonoma Valley Wastewater Treatment Plant treats approximately 2.5 MGD. The treated effluent is discharged into Schell Slough on San Pablo Bay between Nov. 1 and April 30, and is used for irrigating Carneros hayfields and vineyards during the rest of the year.

There are two municipalities with large water recycling programs: 1) the City of Petaluma and 2) Sonoma Valley CSD/Sonoma Water Agency. The former is regulated under the Water Board's General WRR Order 96-011; the permit will be reissued in 2011. The NPDES order for Sonoma County's program is currently outdated and coverage needs to be renewed.

There are also a number of decentralized Wastewater Systems under Waste Discharge Requirements: approximately 9 facilities with WDRs and about a dozen wineries that have submitted ROWDs (Reports of Waste Discharge), but have no formal WDRs in place.

The County is the lead agency for Onsite wastewater treatment systems. (OWTS or "septic systems"); the Water Board regulates large or non-standard facilities. The existing OWTS waiver with the County is due for renewal.

There are also two projects that apply biosolids (sewage sludge) to land, in the south County area.

Groundwater Issues and Activities

Groundwater ambient data from GAMA (the Groundwater Ambient Monitoring and Assessment) program shows nitrates and arsenic in deep layers in areas of Sonoma County; need are more data on shallow aquifers as well. Staff have reviewed the GAMA data for Sonoma and Petaluma Valleys based on 2004 sampling and are in the process of reviewing and summarizing groundwater use data within the Sonoma, Petaluma, and Kenwood Valleys and lowlands. Use of groundwater occurs mainly by farmers, the cities of Sonoma and Petaluma, and domestic well owners. Staff are also reviewing Sonoma Valley's groundwater management plan to understand their supply and protection issues.

Other groundwater issues, activities, and defined needs at the Water Board include:

- Oversight of two closed landfill sites – Petaluma/Casa Grande (City of Petaluma) and Sonoma Landfill (County). The latter has TCE contamination, but pollutants are not leaving the property.
- Cleanup at a skeet shooting range with a low level of contamination; the Sonoma County Land Trust has volunteered to clean the site as part of the San Pablo Bay Wildlife Refuge project at Sears Point.
- Underground Storage Tank sites – leak detection, prevention, investigation and cleanup at service stations and other underground storage tanks containing petroleum fuel
- Need for shallow groundwater monitoring and groundwater-surface water interaction assessments
- Oversight of Site Cleanup Program (SCP) – investigation of recent and historic spills and leaks at various types of sites
- Oversight of a former Department of Defense (radar tower), which includes a future wetland restoration.

Watershed Groups and Watershed Management

Many watershed management efforts are underway in the Sonoma Creek and Petaluma River watersheds. The Sonoma Ecology Center, as discussed below, has been a leader in watershed stewardship, outreach and education, and monitoring and assessment efforts. The Southern Sonoma Resource Conservation District (RCD) has also been very active in stakeholder outreach and restoration and pollution abatement projects. There is also a variety of active citizen stewardship groups focused on specific creeks or watersheds.

Sonoma Ecology Center

The Sonoma Ecology Center (SEC) is a non-profit organization established in 1990, whose mission is to work with the community to enhance and preserve ecological health in Sonoma Valley. The SEC works on a broad range of programs, including education and outreach, creek mapping, creek restoration, and watershed organizing to help preserve and restore the natural areas and ecosystems of Sonoma County. The SEC has worked collaboratively with the Water Board, Sonoma RCD, and other partners over the years to promote watershed stewardship and protect habitats in the Sonoma Creek Watershed. Information at: www.sonomaecologycenter.org

Southern Sonoma Resource Conservation District

The RCD's mission is to improve resource management while supporting sustainable agriculture and our urban communities. They provide technical assistance, education and funding sources to empower landowners to be committed stewards working to improve water quality, prevent soil erosion and improve natural habitat. The RCD also completed a "Petaluma River Watershed Enhancement Plan in July 1999. RCD information is at <http://sscrd.aviandesign.net/>

Sonoma Creek Watershed Enhancement Plan

In 1997, after a two-year effort, the Sonoma Creek Watershed Enhancement Plan was drawn up in order to provide a local voice on watershed management issues and communicate needs. In 2008, the RCD began updating the plan, working with the Sonoma Ecology Center, vineyard owners, agricultural land owners, community members and local, state, and federal agencies to begin a one-year process updating the plan and incorporating into it new knowledge, as well as new awareness of the probable effects of climate change upon the area. This watershed plan will be put together to frame the key issues affecting the watershed, create a list of studies and projects that can be implemented, and identify projects that provide multiple benefits. Some of the areas they will be looking at include water supply and water quality, groundwater supply and retention, use of recycled water and other implement-able site-specific types of projects, such as stabilizing banks, re-vegetation, putting in buffers to slow erosion, assisting landowners in best management practices, and educating residents about a variety of soil and water conservation techniques.

Sonoma County Water Agency Stream Maintenance Plan (SMP)

In June 2009, Sonoma County Water Agency (SCWA) staff presented an overview of SCWA's Stream Maintenance Plan (SMP) to Board staff. SCWA is currently applying to the Water Board for a permit to cover its maintenance activities related to flood control. SCWA's SMP works to minimize environmental impacts from their sediment and vegetation removal activities and bank stabilization projects. For example, SCWA is focusing on identifying specific sediment disposal sites where sediment consistently settles out in a stream, removing sediment from those targeted sites rather than removing sediments throughout an entire reach of a stream. SCWA has also prepared a vegetation management plan that details how it will assess the need to remove vegetation versus thinning or pruning. The vegetation plan also a new approach to both reduce the need for future sediment removal and restore native habitat by planting native riparian trees that will encourage canopy growth to shade out in-stream vegetation that traps sediment in the channel. SCWA also plans to plant native in-stream vegetation that will not reduce the hydraulic capacity of the stream channel as part of the SMP.

Other Creek and Watershed Groups

Other Sonoma County watershed-related groups in Region 2 include the Friends of the Petaluma River <http://www.friendsofthepetalumariver.org/>, the Friends of Adobe Creek, and the Petaluma River Council.

Significant Watershed Issues and Needs

Countywide

- Baseflow issues in creeks, particularly in summer, which may be related to vineyard irrigation and storage.
- Septic system pollutant impacts, needing an inventory of systems and sampling efforts by the County.
- Elevated groundwater nitrates and relation to nutrient TMDLs

Petaluma River Watershed

- The mouth of the Petaluma River is an area of very elevated metals (Ni, Cu, Pb, etc.) as identified in the Regional Monitoring Program reports. Water quality standards are regularly exceeded and are in some cases higher than anywhere else in the Region. Causes are unknown, possibly constant remixing of sediments from tidal action.
- Sedimentation problems in tributaries associated with new development, gullying and agricultural land use practices
- Baseline watershed assessment targeting 303(d) impairment listing is needed, including coordination with stakeholder groups collecting water quality monitoring and watershed assessment data to update the 303(d) list and support TMDL development
- Water quality and habitat impacts due to waterway maintenance and hydromodification
- Implementation of Nonpoint Source Program Management Measures to address: Erosion and Sediment Control, Confined Animal Facilities, Grazing Management, Education/Outreach, Urban Areas, and Hydromodification
- Thorough hydrologic analysis of Petaluma River lower drainage area and impacts of land use changes
- Petaluma River headwaters hydrology study and assessment -- to protect headwaters areas from impacts of future development
- Saving the last intact, high quality riparian habitat sections of the Petaluma River
- Sonoma Baylands wetland restoration

Sonoma Creek

- Development of hillside vineyards and associated erosion and runoff and resultant wastewater management issues
- Increasing water diversions to support increasing vineyard acreage may be affecting stream habitat and anadromous fish survival rate.
- Need to review Sonoma County on-site septic program, participate in quarterly meetings with the County, review proposals for large projects (≥ 1500 gal/day) and projects requesting variances to siting requirements, respond to public concerns, issue permits and enforce as necessary
- Implementation of Nonpoint Source Program Management Measures:
- Erosion and Sediment Control; Grazing Management; Education/Outreach; Forestry; Urban Areas; and Hydromodification
- Development of grazing and vineyard waivers to implement pathogen and sediment TMDLs

Tolay Creek

- Sears Point Raceway expansion and restoration project
- Animal waste management
- Recurrent flooding of homes and domestic septic systems in lower Tolay Creek requiring urgent corrective action
- Implementation of Nonpoint Source Program Management Measures: Erosion and Sediment Control; Confined Animal Facilities; Grazing Management; Education and Outreach; and Hydromodification
- Selective, prioritized enforcement related to TMDL implementation

Proposed Water Board Workplan for FY 2010/11 and 2011/12

- Conduct Sonoma Valley and Petaluma NPDES inspections
- Take action on 401/404 certifications
- CEQA review and comments on general and local area plans
- Dairy inspections and enforcement as needed
- Review the Sonoma County on-site septic program, participate in quarterly meetings with the County, review projects requesting variances to siting requirements, respond to public concerns, and enforce as necessary
- Implementation of TMDLs, including stakeholder outreach, water quality monitoring and watershed assessment, coordination with volunteer monitoring activities
- Implement grazing waiver for Sonoma Creek Watershed
- Develop and implement vineyard waiver for Sonoma Creek Watershed
- Reissue NPDES and Waste Discharge Permits and Waivers of WDRs as needed, including renewal of Waiver of Waste Discharge Requirements for Confined Animal Facilities (primarily dairies), Resolution No. R2-2003-0094
- Implementation of Phase II stormwater permits and oversight by Water Board
- Oversight of construction sites under Statewide Stormwater Permit

High Priority Projects for Grant Funding

Activities to implement TMDLs for Sonoma Creek pathogens and sediments:

- Develop and implement vineyard management plans.
- Develop third party or technical assistance programs to assist with farm/vineyard plan development and implementation.
- Develop Ranch Water Quality Plans (RWQPs) and implement Management Plans for grazing lands and dairies.
- Develop third party or technical assistance programs to assist with RWQP development and implementation.
- Sediment TMDL: implement reach scale habitat and sediment reduction projects
- Sediment TMDL: develop prioritization criteria for reach scale habitat enhancement and incision/erosion projects.
- Studies to complete nutrient TMDL in Sonoma Creek Watershed and to assess impairments in Petaluma River Watershed as part of TMDL development process.

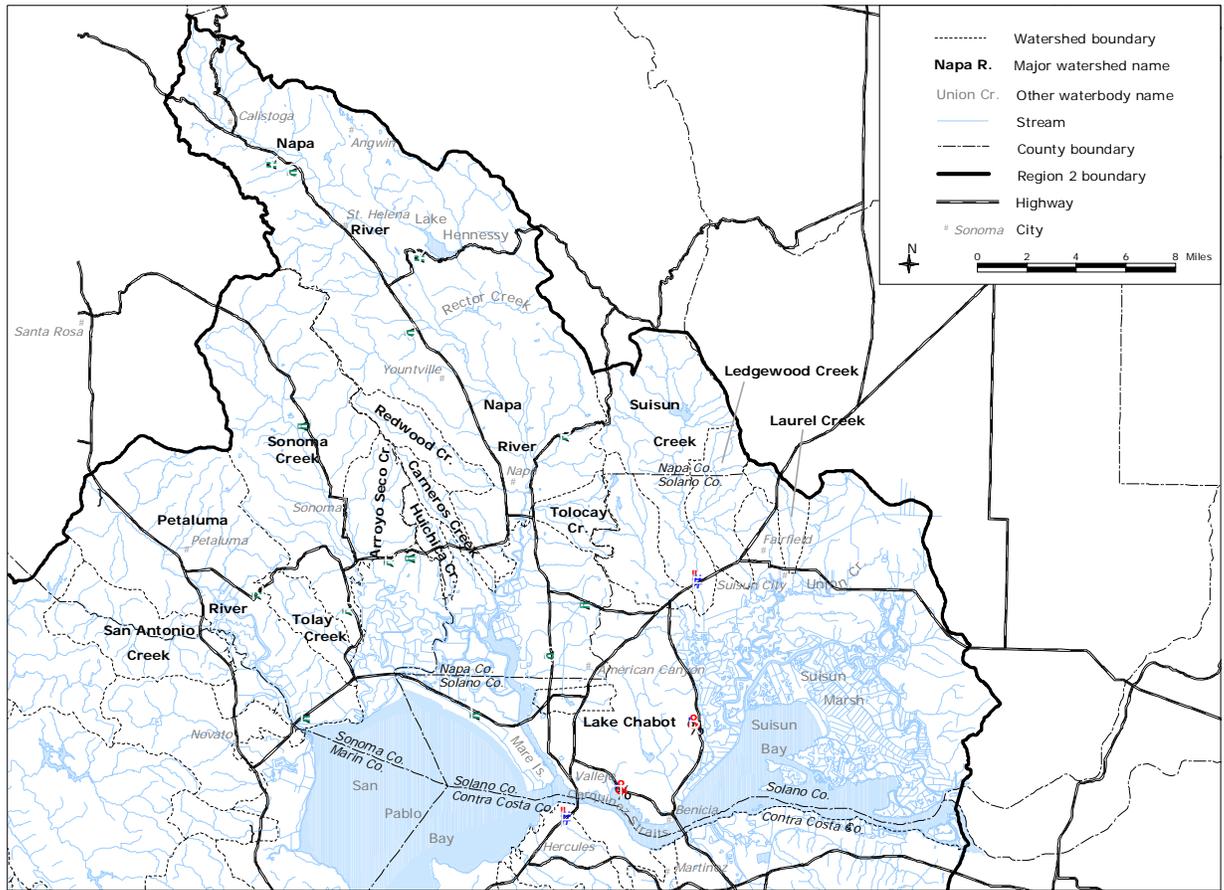


Figure 3-4. Watersheds in Napa, Sonoma, and Solano Counties

3.11 TOTAL MAXIMUM DAILY LOAD (TMDL) PROGRAM

The Clean Water Act requires states to identify impaired waterbodies and the pollutants causing the impairment and to establish the Total Maximum Daily Load (TMDL) of the pollutant to the waterbody necessary to eliminate the impairment. The state must also identify pollutant sources and allocate the allowable pollutant load to the sources. An implementation plan must also be established. The complete TMDL including allocations and implementation plan must be incorporated into the Basin Plan.

A complete TMDL includes the following specific elements:

- *Problem Statement:*
Description of which standards are not being attained, which beneficial uses are impaired and the nature of the impairment.
- *Numeric Targets: The Desired Future Condition:*
Measurements that will describe protection of the beneficial uses that are impaired, and attainment of standards. They should provide a basis to assess progress towards, or attainment of standards. Numeric targets may be existing, new, or site-specific numeric water quality objectives. Alternatively they may be a quantitative measure that is a surrogate for a narrative water quality objective or a surrogate for a numeric water quality objective that provides a better basis to link sources to the impairment.
- *Source Analysis:*
Amount, timing, and point of origin of pollutants of concern.
- *Linkage Analysis:*
Description of the relationship between numeric target(s) and sources and estimation of the assimilative (loading) capacity of the water body for the pollutant. The loading capacity is the quantitative link between the applicable water quality standard (as interpreted through numeric targets) and the TMDL.
- *TMDL and Allocations:*
The TMDL may be all or part of the loading capacity. The TMDL is then allocated amongst point, nonpoint, and background sources. Allocations may be specific to agencies or persons (businesses) or generally by source category or sector.
- *Margin of Safety:*
A margin of safety must be incorporated into the TMDL. The margin of safety may be implicit (using conservative assumptions) or explicit (a discrete allocation assigned to the margin of safety).
- *Implementation Plan:*
Actions, responsible parties, and schedules necessary to alleviate the impairment and meet the allowable TMDL and allocations. Identifies enforceable features (e.g. prohibition), and triggers for Regional Board action (e.g. performance standards). May be part of a watershed management plan.
- *Monitoring / Reevaluation:*
Monitoring strategy to track implementation of actions and elimination of impairment, and, if necessary, consideration of TMDL revisions.

Our strategy is to approach each TMDL from the perspective that solution of the water quality problem is the goal not the TMDL itself. As such, we will evaluate the need and benefit of tasks in each of the complete TMDL elements and focus resources on tasks

most critical to the ultimate solution. For example, problem definition would be a high priority for waterbodies that may be listed as impaired based on limited, outdated or poor quality data. Source analysis may be the critical gap for other TMDLs. Consideration of implementation alternatives, enforcement mechanisms, and watershed management will be critical for TMDLs that have nonpoint sources as the primary source of the water quality impairment.

TMDL projects and schedules for the San Francisco Bay Region are available on the Regional Board website at www.swrcb.ca.gov/rwqcb2/tmdlmain.htm. The website also describes the TMDL process and TMDL reports completed to date.

The WMI provides an operative framework to meet the challenges associated with the development and implementation of TMDLs for pollutants causing impairment of waters. A complete TMDL encompasses many tasks and activities directly or indirectly associated with watershed/waterbody characterization, assessment, and management and other programs (e.g., NPDES, Nonpoint Source Program, Monitoring and Assessment, and Basin Planning). Consequently, TMDL development and implementation must be closely coordinated with watershed and program tasks on both the regionwide and county watershed management area levels. Accordingly, TMDL related issues and tasks are appropriately noted in other sections of this Chapter.

Stakeholder participation and support will be essential for all TMDL projects. We continually identify and create opportunities to enhance involvement and collaboration with stakeholders. These efforts include improved outreach and communication associated and improved descriptions and use of stakeholder involvement and collaboration opportunities and mechanisms. Integral to this effort will be the recognition that stakeholders may bring information and expertise to the table. For each TMDL project, we will strive for the most focused and efficient process that allows all stakeholders to effectively participate and ensures balanced representation on any recognized “watershed” or stakeholder forum. Mechanisms will range from compilation and maintenance of interested parties lists to formally recognized and facilitated stakeholder forums. Other state and federal agencies are key stakeholders in the development and implementation of TMDLs. Our TMDL efforts overlap authorities and programs of other agencies. Certain TMDLs are dependent on efforts by these other agencies (e.g., pesticide TMDLs and the USEPA and DPR). In some cases, actions by other agencies may even conflict with or create barriers to TMDL efforts. We will seek opportunities to enhance coordination and collaboration with other agencies, and overlaps, conflicts, and barriers will be identified and appropriate resolutions, agreements, etc. will be pursued.

There are a number of significant challenges that do not have easy resolution that we must overcome to succeed. San Francisco Bay is an estuary with complex hydrodynamics and sediment and biochemical fate and transport processes, and there are significant limitations to existing quantitative fate and transport models. A number of water quality problems are due to chemicals that are no longer in use and have no known active discharges (e.g., DDT). Others are due to sources beyond the jurisdiction of the

Regional Board (e.g., mercury, pesticides). A number of waterbodies are impaired due to excessive siltation, but it is very difficult to distinguish between natural and human caused sources of sediment, and to distinguish between excessive siltation and impairment due to flow alterations. These challenges and the potential high costs associated with their resolution provide further cause to work within the Watershed Management Initiative to set priorities and identify cost-effective tasks to establish and attain TMDLs through integration with other efforts and collaboration with stakeholders.

As previously noted, the WMI provides the operative framework for allocation of these resources and identification of priorities and additional resource needs. We have regionwide project and program management resource needs in addition to specific TMDL project resource needs. These include management of the TMDL program (roundtable participation, preparation of workplans and reports, program development and budget planning, outreach and education, participation in workshops and other forums) and development of a regionwide sediment TMDL strategy.

Numerous water bodies in the San Francisco Bay Region are listed as impaired due to excessive siltation or sedimentation. Consequently, sediment TMDLs including implementation plans are required to remedy the impairments. A regional approach to this challenge (versus one watershed at a time) provides economies of scale in terms of both resources and time. The regional approach is founded on the premise that subwatershed areas with common attributes that influence sediment input (geology, vegetation, land use, and topography) can be defined and characterized. Characterization and assessment of representative subwatershed areas will provide reference states, a quantitative understanding of sediment production and its relationship to habitat quality, and a basis for distinguishing sediment associated with natural processes from sediment from land-use activities. A key first step in this strategy is the compilation of data relevant to the findings of impairment in the listed water bodies.

We are fortunate to have dedicated resources for TMDL development and a TMDL Unit that promotes a team approach and provides a focal point for TMDL activities in the Region. In addition to the TMDL Unit, we coordinate and integrate actions and activities of our Planning Unit, which is combined with TMDL into one Division, and with the Watershed Management and NPDES Divisions. Improved coordination and integration among these areas and other functions of the Regional Board are a high priority.

Further information about our TMDL program and status of individual TMDLs in the Region can be found on our website at:

http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/