

SECTION H

Impacts and Benefits

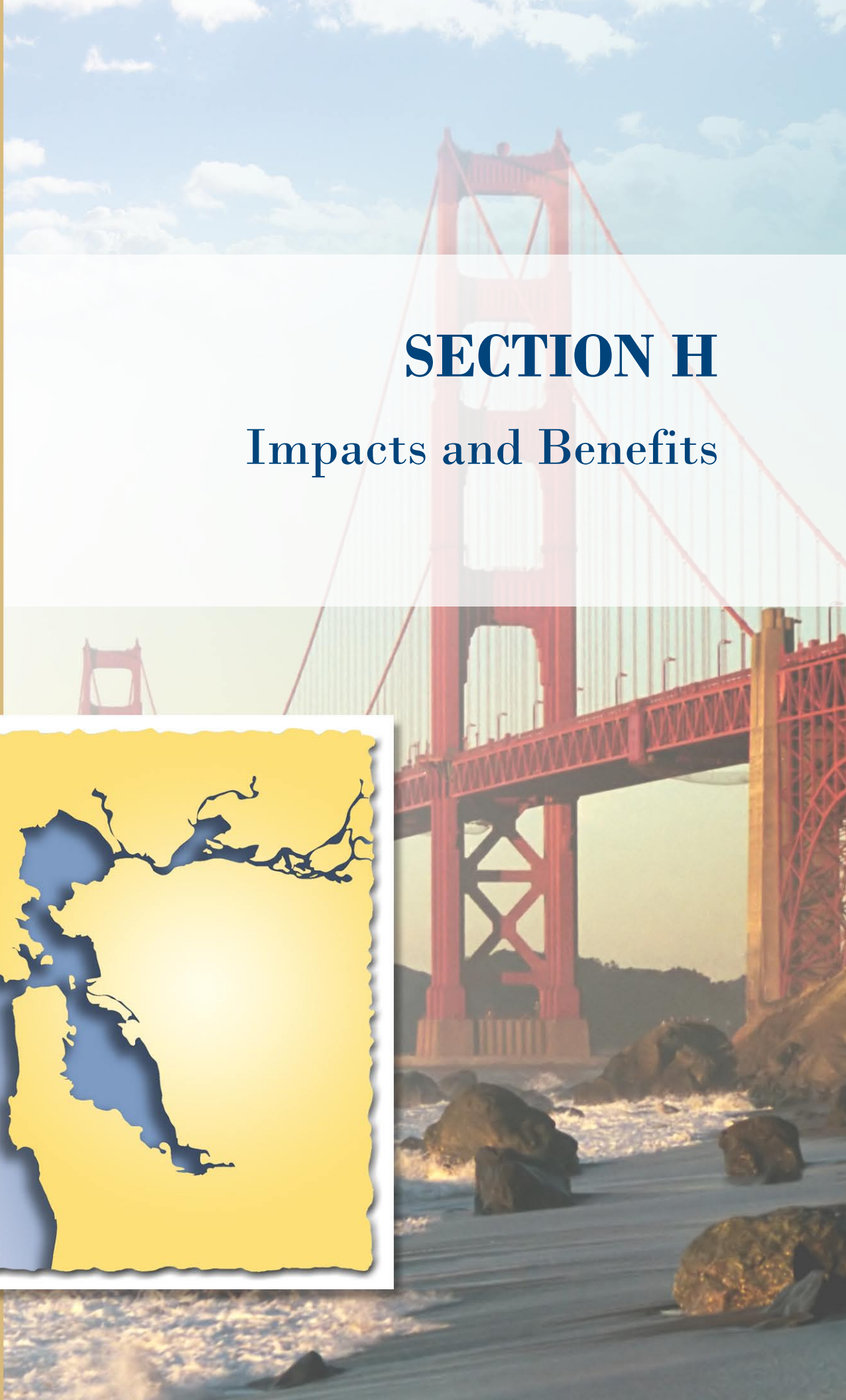




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Acronyms Appearing in this Section

ACREEC	Alhambra Creek Restoration and Environmental Education Collaborative
ACWD	Alameda County Water District
ADLL	Arroyo de la Laguna
AFY	acre-feet per year
BMPs	best management practices
C/CAG	City and County Association of Governments
CCC FC&WCD	Contra Costa County Flood Control and Water Conservation District
CCWD	Contra Costa Water District
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CNPS	California Native Plant Society
COLD	cold freshwater habitat
CWA	County Water Agency
DDSD	Delta Diablo Sanitation District
DFG	California Department of Fish and Game
DSRSD	Dublin San Ramon Services District
EBMUD	East Bay Municipal Utility District
EDCs	endocrine disrupting compounds
GGNRA	Golden Gate National Recreation Area
GIS	geographical information system
gpd	gallons per day
IRWM	Integrated Regional Water Management
IRWMP	Integrated Regional Water Management Plan
JPA	Joint Powers Authority
LEAD	Low Energy Application of Desalination
LOMU	Letter of Mutual Understandings
MBR	membrane bioreactor
MIGR	migration of aquatic organisms
MGD	million gallons per day
MMWD	Marin Municipal Water District
MWSD	Montara Water and Sanitary District
NDMA	n-nitrosodimethylamine
NGOs	Non-Governmental Organizations
NPS	Non-point source
PCBs	polychlorinated biphenyls
PCCPs	pharmaceuticals and personal care products
RARE	Richmond Advanced Recycled Expansion
RCD	Resource Conservation District
RWF	Recycled Water Facility
RWQCP	Regional Water Quality Control Plant
SBWR	South Bay Water Recycling
SCC	State Coastal Conservancy
SCVWD	Santa Clara Valley Water District
SFPUC	San Francisco Public Utilities Commission
SLT	Sonoma Land Trust
SPWN	spawning, reproduction, and/or early development of fish
SRA	State Recreation Area



SRWTP	Satellite Recycled Water Treatment Plant
STOPPP	Stormwater Pollution Prevention Program
TCC	Technical Coordinating Committee
TMDL	total maximum daily load
Zone 7	Zone 7 Water Agency



Section H Impacts and Benefits

IRWMP Appendix A Guidelines

Section H: Impacts and Benefits

- *Discuss at a screening level the impacts and benefits from Plan implementation.*
- *Include an evaluation of potential impacts within the region and in adjacent areas from Plan implementation.*
- *Identify the advantages of the regional plan; including a discussion of the added benefits of the regional plan as opposed to individual local efforts.*
- *Identify which objectives necessitate a regional solution.*
- *Identify interregional benefits and impacts.*
- *Describe the impacts and benefits to environmental justice or disadvantaged communities.*
- *Include an evaluation of impacts/benefits to other resources, such as air quality or energy.*

This section provides a screening-level discussion of the potential impacts and benefits of implementation of the Bay Area IRWMP, first at the regional water strategy level and then at a project-specific level. As discussed in Section C: *Objectives*, the “promotion of economic, social and environmental sustainability” was identified as one of six primary goals for Bay Area IRWMP, and was also a goal of all four functional areas that contributed to the Plan. Objectives of this regional goal include minimizing net environmental impacts while also maximizing public involvement in regional planning and public benefit from Plan implementation. As such, the projects included for implementation have been selected, in part, due to their ability to provide maximum benefits with minimum impacts.

H.1 Overview of Bay Area IRWMP Implementation Approach

The LOMU signatories are planning to adopt the Bay Area IRWMP by January 1, 2007. Following adoption, the Bay Area IRWMP will be implemented through execution of priority projects identified in this Plan by respective project proponents. Progress toward attaining the regional goals and objectives will be reviewed periodically. A living document, additional work will be completed on the IRWMP as needed through an adaptive management framework, overseen by the successor to the TCC - the San Francisco Bay Area IRWMP Coordinating Committee – as described in Section G: *Implementation*.

Adoption of the IRWMP does not entail a direct commitment of resources. The IRWMP consists of a planning study and basic data compilation that would not result in the disturbance of any environmental resource. These activities are exempt from the California Environmental Quality Act pursuant to CEQA Guidelines §15262 and §15306. As such, programmatic environmental analysis under CEQA is not required.

Implementation of each short term priority project included in the IRWMP will be the responsibility of the project proponent and any applicable project partners. There is no joint commitment or responsibility by the IRWMP participants or LOMU signatories to implement any or all of the projects. Furthermore, the project proponents and applicable project partners have discretionary authority over project design and implementation, and may elect not to implement a project based on many factors including lack of funding, environmental consequences, or changing regional conditions or needs. If implementing a project, project proponents bear responsibility for ensuring all regulatory requirements for the project are met.



While the Bay Area IRWMP does include a discussion of applicable environmental requirements for implementation of specific projects, it should be noted that the IRWMP in and of itself is not a CEQA compliance document and is therefore not subject to CEQA noticing requirements. Outreach associated with environmental review of specific projects recommended in the IRWMP will be conducted by the entities responsible for implementing those projects.

H.2 Impacts and Benefits of Plan Implementation

Potential impacts and benefits of Plan implementation include both direct and indirect (or secondary) effects that could result from implementation of the proposed projects. Potential project impacts may be related to temporary changes in air and water quality, habitat distribution and other physical factors due to construction activities. The magnitude of the impact, and the potential for cumulative impacts (i.e., when two or more individual impacts compound/increase environmental effects), are important considerations. Although impacts will be mitigated as appropriate on a project-by-project basis, the following discussion addresses the likely impacts of Plan Implementation in general.

Potential benefits of Plan implementation include actions to support the Bay Area IRWMP vision of “*working together to enhance sustainable water resources management to support a high quality of life in the Bay Area.*” Plan implementation also satisfies the overall Proposition 50 Grant Program goals of encouraging “integrated regional strategies for management of water resources” and “protection of communities from drought, protection and improvement of water quality, and improvement of local water security”. Potential on-the-ground benefits related to Plan implementation include protection and improvement of water supplies, riparian and aquatic ecosystems, public health and safety, and other physical conditions. Implementation of IRWMP projects will also provide cumulative benefits to the region.

The following sections describe the general impacts and benefits that can be expected from implementing the water management strategies outlined in Section D: *Water Management Strategies* of this IRWMP, which encompass the San Francisco Bay Area’s water management approaches for meeting the regional goals and objectives.

H.2.1 Ecosystem Restoration Impacts and Benefits

Potential adverse impacts resulting from implementation of *Ecosystem Restoration* projects are largely temporary, generally occurring during construction phases. Long-term impacts may include changes in the distribution of aquatic and riparian vegetation species. Changes in the physical characteristics of in-stream and floodplain habitats can lead to associated changes in local species composition and diversity, as the new conditions may favor a different suite of species.

Implementation of such projects may result in both direct and indirect benefits related to the protection and enhancement of physical and biological processes. Rehabilitation of wetlands and riparian ecosystems provides critical habitat to local species and allows natural physical processes, such as creek migration or floodplain recruitment, to occur. Such improvements may support flora and fauna populations, reduce the occurrence of localized flooding, and improve water quality. Expansion of riparian or wetlands habitats can slow or delay peak flood flows, thereby indirectly providing public health and safety benefits. Improvements to local ecosystems may result in enhancements to several beneficial water uses as defined by the San Francisco Bay Basin Plan including, but not limited to: freshwater habitat, estuarine habitat, preservation of rare and endangered species, fish migration, and fish spawning. Additionally, *Ecosystem Restoration* projects may include design components that provide benefits to recreation, groundwater recharge, and water supply.



H.2.2 Environmental and Habitat Protection and Improvement Impacts and Benefits

Whereas the *Ecosystem Restoration* water management strategy focuses on the active physical and biological restoration of natural systems, the *Environmental and Habitat Protection and Improvement* strategy is more directed toward protection through a variety of approaches (including restoration, but not limited to restoration only). Many of the projects in this Plan involve work within or adjacent to sensitive habitats such as streams, rivers, lakes, wetlands, and marine environments. Key impacts related to implementation of *Environmental and Habitat Protection and Improvement* projects include construction-related impacts, changes in or loss of sensitive habitat areas, changes to the hydrologic makeup of a site, and effects on land use planning and local land values. In general, projects involving work within or adjacent sensitive habitats will incur certain unavoidable impacts such as temporary disturbance to native species, temporary dewatering of certain areas, and potential disturbance of bottom sediments. Land preservation projects, namely protection of watershed lands by regional water agencies, may result in a reduction of available space for other uses (e.g., residential development) and increased land values in adjacent areas.

Benefits resulting from implementation of *Environmental and Habitat Protection and Improvement* projects emphasize restoration of hydrologic and geomorphic function, including flow conveyance, maintenance of channel and bed form, sediment transport and deposition, floodplain connection, and filtration of pollutants in the water column. Benefits to wildlife from habitat improvements include the addition of cover, nesting, and forage areas; improvement to soil quality; increase in the diversity of native vegetation and habitat structure; and creation of new wildlife corridors. Stream restoration projects can improve access to historic steelhead spawning and rearing habitats; improve conditions for movement by juveniles; increase the diversity of benthic taxa; and lower water temperature along the bank. Benefits may also extend to improved water supply quality and reliability. Improved water quality ensures the health and well being of terrestrial and aquatic species by providing clean water for all stages of the lifecycle.

H.2.3 Water Supply Reliability Impacts and Benefits

Since such a diverse array of projects address the *Water Supply Reliability* strategy and can range from everything from protection of watershed headlands (source waters) to large capital projects such as construction of new conveyance and treatment facilities, the potential impacts associated with this strategy are also diverse. *Water Supply Reliability* projects have the potential to result in adverse impacts related to changes in visual quality adjacent to above-ground infrastructure, loss or disturbance of biological resources, and potential growth-inducing effects on population and housing due to provision of water supplies.

Benefits from *Water Supply Reliability* projects relate to local water agencies' capability to provide reliable water resources to the growing Bay Area population. Other benefits may also be realized for utilities and service systems, and population and housing. Implementation of *Water Supply Reliability* projects may also support several beneficial water uses as defined by the San Francisco Bay Basin Plan including, but not limited to: groundwater recharge, industrial service supply, and municipal and domestic water supply. In addition, improved water supply reliability is consistent with Proposition 50 Program objectives and CALFED objectives.



H.2.4 Flood Management Impacts and Benefits

Potential adverse impacts resulting from implementation of *Flood Management* projects will generally include temporary impacts during construction phases. General approaches to *Flood Management* have evolved over the last several years from largely single-objective flood capacity type approaches to more multi-objective approaches that consider many resources. Often, this new approach toward *Flood Management* has resulted in more naturalized channel systems and maintenance that consider streams and floodplains hydrologic function and vegetation into the design. When implemented, this multi-objective approach results in fewer impacts to environmental resources for such topics as channel aesthetics, hydrology, sediment transport, and water quality compared to past approaches that may have relied solely on channelization and bank hardening techniques, etc. While there have been improvements in the general approach to *Flood Management*, there are still several potential impacts that may occur with *Flood Management* projects. Some of these potential impacts include: changes in the frequency, duration, and magnitude of stormflows and flooding, as well as changes in the timing/seasonality of flows. Such hydrologic effects may potentially decrease the health and vigor of established floodplain vegetation, and eventually alter the distribution of floodplain habitats. Furthermore, modifications to existing hydrologic processes, or hydromodification from more urban type landscapes, may lead to water quality and hydrology impacts.

Potential benefits realized through implementation of *Flood Management* projects include the protection of public safety through the management of stream flow volumes and peak flood events. Increased use of floodplains for flood water storage/detainment allows for overbank flows to spread out along the floodplain and delay and/or reduce peak flows and also provides several habitat and ground water recharge benefits. Reduction of peak flows provides protection of downstream properties and infrastructure from flood damage. Within the channel/floodplain natural system, high-magnitude flows (or 'floods') are important mechanisms to 'refresh' the structure of aquatic and riparian habitats. Floods recruit large woody debris to the channel and determine the frequency of major habitat disturbance in the in-stream environment. Flood cycles contribute to species composition and diversity within a watershed. Advantageous *Flood Management* projects seek to reduce threats to human safety and property while potentially increasing benefits to natural hydrologic processes. Implementation of *Flood Management* projects may also support several beneficial water uses as defined by the San Francisco Bay Basin Plan including, but not limited to: cold freshwater habitat, groundwater recharge, fish migration, fish spawning, and wildlife habitat.

H.2.5 Groundwater Management Impacts and Benefits

Potential adverse impacts resulting from implementation of *Groundwater Management* projects will generally include temporary impacts during construction phases. Development of groundwater recharge areas may also result in inundation of potential habitat areas.

The benefits of effective *Groundwater Management* can include increased supply reliability through protection against overdraft, protection of water quality from sea water intrusion, and other potential contaminant sources. For water agencies that also use surface water supplies, *Groundwater Management* also provides flexibility to conjunctively use these supplies to maximize reliability. Implemented projects may provide benefits to biological resources in the form of new wetland areas surrounding settling ponds that support a variety of flora and fauna. Implementation of *Groundwater Management* projects may also support several beneficial water uses as defined by the San Francisco Bay Basin Plan including, but not limited to: groundwater recharge, industrial service supply, and municipal and domestic water supply.



H.2.6 Recreation and Public Access Impacts and Benefits

Adverse impacts resulting from implementation of *Recreation and Public Access* projects will generally include temporary impacts during construction phases. Depending on the location, implementation of *Recreation and Public Access* projects may also impact water quality and natural resources. *Recreation and Public Access* projects are often included as a component of *Ecosystem Restoration*, *Environmental and Habitat Protection and Improvement*, and *Flood Management* projects. Implementation of such projects would result in similar impacts to those discussed above under *Ecosystem Restoration*, *Environmental and Habitat Protection and Improvement* and *Flood Management*.

Development of *Recreation and Public Access* projects provide multiple benefits locally and regionally. New parks and trails provide expanded recreation opportunities, encouraging people get out-of-doors to walk or hike. Spending more time in local or regional parks may provide education opportunities through docent-guided tours or interpretive signage. Education and connection to the natural environment may increase social investment in protection of local natural resources. Appropriate site selection and design of new open spaces may also provide habitat or movement corridors to help sustain healthy populations of wildlife. Associated site improvements may reduce pollutant loading, such as sediment from eroded stream banks, to local streams. Implementation of *Recreation and Public Access* projects may also support several beneficial water uses as defined by the San Francisco Bay Basin Plan including, but not limited to: freshwater habitat, water contact recreation, and wildlife habitat.

H.2.7 Storm Water Capture and Management Impacts and Benefits

Adverse impacts resulting from implementation of *Storm Water Capture and Management* projects will generally include temporary impacts during construction phases. *Storm Water Capture and Management* projects can also unintentionally lead to concentrations of surface water pollutants, through detention of urban runoff laden with pesticides and other contaminants. *Storm Water Capture and Management* projects may also have the potential adverse impact of groundwater contamination.

Storm water capture systems, such as detention basins, incorporated into the design of a new development can result in beneficial management of the storm hydrograph. By detaining peak flows generated from new impervious surfaces, *Storm Water Capture and Management* projects prevent disruption of natural flow cycles and potential downstream flooding impacts. These projects may also provide a wide range of benefits related to water supply, water quality, ecosystem restoration, recreation, and public health. Increasingly, new urban development projects utilize detention basins, roof gardens, or cisterns to capture and manage stormwater on-site. These actions may provide recreational opportunities by incorporating dual-acting design features such as detention basins that are used as playing fields or parks during summer months. Design components can also address other watershed scale issues such as filtration of runoff through vegetation, which reduces subsequent pollutant loading in receiving water bodies. Implementation of *Storm Water Capture and Management* projects may support several beneficial water uses as defined by the San Francisco Bay Basin Plan including, but not limited to: groundwater recharge, marine habitat, and water contact recreation.

H.2.8 Water Conservation Impacts and Benefits

Potential impacts associated with implementing *Water Conservation* projects include growth-inducing effects on population and housing. The benefits of *Water Conservation* include additional supply reliability without any of the construction-related impacts associated with other supply reliability projects. In addition, *Water Conservation* projects have the benefit of reducing demands on imported water supplies such as the Delta, thereby lessening pressure of competing demands on a limited resource.



H.2.9 Water Quality Protection and Improvement Impacts and Benefits

Water Quality Protection and Improvement projects include a broad range of approaches that may focus on single or multiple links in the water supply chain, from protection of headwaters areas to local water treatment facilities to wastewater discharges into the San Francisco Bay. Because of the far-reaching range of possible approaches, *Water Quality Protection and Improvement* projects may vary greatly; therefore, impacts and benefits associated with these projects vary. For example, one approach many local water agencies use to protect water quality is to purchase watershed lands surrounding a reservoir. The impacts and benefits associated with this type of project would be similar to those described above under *Environmental and Habitat Protection and Improvement*. Another approach may be to install NPS treatment mechanisms on outfalls to local storm sewer systems or canals. The impacts and benefits associated with this type of project would be similar to those described above under *NPS Pollution Control*.

Potential adverse impacts that may result from *Water Quality Protection and Improvement* projects include temporary impacts during construction phases, disposal of brine from wastewater treatment facilities, and/or disturbance of sensitive species during restoration of wetlands habitat areas. Although significant impacts should be effectively precluded by best management practices incorporated in projects' mitigation plans, cumulative effects of project implementation may adversely impact the environment.

Benefits resulting from implementation of *Water Quality Protection and Improvement* are numerous and far-reaching. Many projects protect water resources by reducing pollutant loading from permitted discharges and/or NPS such as urban stormwater runoff and air deposition. Water quality can also be improved indirectly through expansion of impervious surface area, increased filtration through riparian and aquatic vegetation, and reduction of sediment source areas. Improvement of surface water quality may benefit drinking water supplies that serve the Bay Area population, as well as aquatic habitat for amphibians, fisheries, and waterfowl. Improved water quality ensures the health and well-being of terrestrial and aquatic species by providing clean water for all stages of the lifecycle. Such improvements can reduce pollutant bioaccumulation within fish species that are consumed by local residents, thereby reducing a public health hazard. Implementation of *Water Quality Protection and Improvement* projects may support several beneficial water uses as defined by the San Francisco Bay Basin Plan including, but not limited to: agricultural supply, freshwater habitat, industrial service supply, municipal and domestic supply, water contact recreation, fish spawning, and wildlife habitat.

H.2.10 Water Recycling Impacts and Benefits

Potential impacts from implementation of *Water Recycling* projects include temporary construction-related impacts. Additional impacts can include potential water quality impacts from nutrient and salinity loading and emerging contaminants, increased energy usage and costs (compared to potable supplies) from the treatment process, and potential growth-inducing impacts resulting from improved *Water Supply Reliability*.

Potential benefits from *Water Recycling* projects include improved *Water Supply Reliability* through creation of a drought-proof supply that can offset use of potable water supplies for non-potable demands. *Water Recycling* projects may also benefit the Delta and other watersheds by reducing dependence on those supplies and lessening pressure of competing demands on a limited resource. *Water Recycling* can benefit salt-water and marshland habitats by providing a water supply for use in restoring and preserving these habitat. Implementation of *Water Recycling* projects may also support several beneficial water uses



as defined by the San Francisco Bay Basin Plan including, but not limited to: industrial service supply, and municipal (irrigation) water supply.

H.2.11 Wetlands Enhancement and Creation Impacts and Benefits

The *Wetlands Enhancement and Creation* strategy is similar to the *Ecosystem Restoration* strategy described above but is more specifically focused to wetlands and aquatic habitats. Adverse impacts related to *Wetlands Enhancement and Creation* projects are similar to those discussed above under *Ecosystem Restoration*, including temporary impacts from construction activities, long-term impacts related to changes in species distribution, and potential increases in the property value of nearby areas. Given the nature of some projects in this category that strive to create wetlands where currently there are none, impacts to the physical characteristics of the project site are implicit in the project itself.

As with impacts, benefits resulting from implementation of *Wetlands Enhancement and Creation* projects are similar to those discussed under *Ecosystem Restoration*. These projects provide important nesting, foraging, and breeding grounds for a wide variety of local and migratory waterfowl, fisheries, and small mammals. *Wetlands Enhancement and Creation* projects seek to restore freshwater and tidal wetlands acreages to historic distributions across the Bay Area. Implementation of *Wetlands Enhancement and Creation* projects may support several beneficial water uses as defined by the San Francisco Bay Basin Plan including, but not limited to: estuarine habitat, freshwater habitat, groundwater recharge, marine habitat, preservation of rare and endangered species, and wildlife habitat.

H.2.12 Conjunctive Use Impacts and Benefits

Conjunctive Use is the coordinated and planned use of surface water in conjunction with groundwater. It involves the use and/or storage of excess surface water supplies in local groundwater basins during wet periods so that groundwater can be withdrawn when additional supplies are needed during dry periods. As such, the potential impacts of *Conjunctive Use* strategies are similar to those impacts of groundwater and surface water strategies and include temporary construction impacts, the potential for growth-inducing effects, visual impacts from above-ground infrastructure, and the potential for increased energy usage and costs associated with pumping groundwater supplies

Benefits of the *Conjunctive Use* strategy include additional supply reliability, increased flexibility in operations, better management of the groundwater basin against overdraft and seawater intrusion, and better management of surface water supplies during dry periods. Implementation of *Conjunctive Use* projects may also support several beneficial water uses as defined by the San Francisco Bay Basin Plan including, but not limited to: groundwater recharge, industrial service supply, and municipal and domestic water supply.

H.2.13 Desalination Impacts and Benefits

Potential impacts from *Desalination* projects include temporary construction impacts, water quality impacts from brine disposal, increased energy use and cost, and growth-inducing impacts associated with a new water supply.

Potential benefits of *Desalination* include a new source of potable water supply, a high quality supply – even during periods of drought – and reduced dependence on imported supplies, which in turn can provide environmental benefits associated with having more supply available for environmental demands. Implementation of *Desalination* projects may also support several beneficial water uses as defined by the San Francisco Bay Basin Plan including, but not limited to: industrial service supply, and municipal and domestic water supply.



H.2.14 Imported Water Impacts and Benefits

Depending on the nature of the project, *Imported Water* projects can have temporary construction-related impacts, potential impacts to natural stream flows depending on diversion schedules, potential impacts to habitat associated with the construction of conveyance facilities, and increased energy usage and costs associated with conveying supplies over long distances.

Benefits of *Imported Water* include improved *Water Supply Reliability* through a diversified water supply portfolio. In addition, imported water supplies (from Sierra Nevada snowmelt) tend to be of improved water quality compared to local Bay Area supplies. This provides benefits associated with reduced treatment costs and reduced public health risks from disinfection byproducts, etc.

H.2.15 Land Use Planning Impacts and Benefits

Typically conducted at the county, municipal, and local scale, *Land Use Planning* utilizes a variety of approaches to create a sustainable distribution of land use types, patterns, and densities based on economic requirements, housing needs, and resource protection and management. In terms of resource protection, planning approaches in the Bay Area include hillside or stream set-back ordinances that restrict building in sensitive zones, conservation easements, and building restrictions in geologically sensitive areas. *Land Use Planning* projects are often strategic in nature. State legislature and planning agencies also play a role in *Land Use Planning* by identifying processes through which water resources must be identified in advance of development (e.g., SB 610/221 requiring a water supply assessment for new developments). If the *Land Use Planning* process is collaborative and reflects many local interests and desires, as well as appropriate and beneficial outcomes, impacts will likely be reduced. The actual physical impacts and benefits of such planning projects would likely fall into one of the other water management strategies discussed in this section upon the implementation of the plan.

Benefits realized through implementation of *Land Use Planning* projects include environmental education, opportunities for volunteerism, and collaborative partnerships. Ongoing community stewardship is an important benefit that accrues through group activities and volunteerism. In addition, regional level *Land Use Planning* may include inter-agency collaboration and development of plans and/or programs that address the long-range needs and concerns. Regional or watershed-based habitat conservation plans are examples of regional-scale *Land Use Planning* under development throughout the Bay Area. These plans serve as a guide for development in areas that are less environmentally sensitive while providing a mechanism to protect lands that are more environmentally sensitive. Benefits of *Land Use Planning* include a coherent and informed approach to addressing the needs of an urban or urbanizing area through thoughtful and resource sensitive development. Development and implementation of cogent *Land Use Planning* projects may support several beneficial water uses as defined by the San Francisco Bay Basin Plan including, but not limited to: areas of special and biological significance, and preservation of rare and endangered species.

H.2.16 Non-Point Source Pollution Control Impacts and Benefits

NPS Pollution Control projects may range from end-of-pipe improvements to existing storm sewer systems, to development of a regional approach to reducing pollution in urban storm runoff, to education of the general public about ways people can reduce pollution through their daily routine. Due to the varied approaches in addressing *NPS Pollution Control*, impacts will be varied. Capital improvement projects will have temporary construction impacts as well as longer term impacts that may include reduction in available developable land. Strategic planning and public education, like the *Land Use Planning* projects discussed above, will have few, if any, impacts.



Non-point source pollution is the nation's leading source of water quality degradation¹ and it contributes largely to the health of streams and other water bodies in the Bay Area. Therefore, benefits resulting from implementation of *NPS Pollution Control* projects will directly support almost all beneficial water uses as defined by the San Francisco Bay Basin Plan. Reduction of NPS pollution improves water quality for wildlife, aquatic species, water contact recreation, and human consumption. As discussed above under *Land Use Planning*, development of regional *NPS Pollution Control* programs and policies may also accrue benefits through the collaboration and cooperation of multiple agencies.

H.2.17 Surface Storage Impacts and Benefits

Surface Storage project impacts include temporary construction impacts, impacts to the local habitat around the surface water storage structure, impacts to the natural flows of the watershed and fishery migration and spawning habitat, and impacts to water quality resulting from sedimentation and temperature stratification. Loss of water supply through evaporation is another potential impact.

Benefits of *Surface Storage* include improved *Water Supply Reliability*, especially in drought years. *Surface Storage* also has the potential to provide hydro-electric benefits such as an energy supply and potential revenue source. *Surface Storage* also provides *Flood Management* benefits and opportunities for *Recreation and Public Access*, and enables water agencies to adapt to loss of snow pack storage due to global warming.

H.2.18 Watershed Planning Impacts and Benefits

Watershed Planning involves inter-agency collaboration to examine watershed conditions and develop targeted management strategies for improving watershed health. Similar to the *Land Use Planning* projects discussed above, *Watershed Planning* projects are generally strategic in nature and therefore have few, if any, adverse impacts. Implementation of projects identified through the *Watershed Planning* process, such as fish passage improvements or reduction in flooding hazards, may have individual project impacts. These projects may vary in scope and likely fit into another water management strategy discussed in this section. However, individual project impacts are separate from the effects of a *Watershed Planning* process. Given that *Watershed Planning* projects focus on improving overall watershed health, impacts, if any, are likely to be construction-related temporary impacts.

As with *Land Use Planning*, benefits of *Watershed Planning* efforts include environmental education, opportunities for volunteerism, and collaborative partnerships. Inter-agency cooperation accrues benefits through the development of collaborative planning goals and strategies. Using a watershed approach is beneficial because it addresses problem solving in a holistic manner with all appropriate stakeholders involved. Because projects proposed through watershed planning focus on improvements to watershed health, such projects may significantly reduce pollutant loading to streams and other local water bodies, improve or restore critical habitat areas, remove passages to fish passage, reduce sediment loading and transport, and provide recreational and educational opportunities. Implementation of *Watershed Planning* projects may support several beneficial water uses as defined by the San Francisco Bay Basin Plan including, but not limited to: cold freshwater habitat, estuarine habitat, fish migration, marine habitat, fish spawning, and wildlife habitat.

¹ U.S. Environmental Protection Agency. 2006. Polluted Runoff (Nonpoint Source Pollution). Available: < <http://www.epa.gov/owow/nps/>>. Accessed: June 19, 2006.



H.2.19 Water and Wastewater Treatment Impacts and Benefits

Impacts from *Water and Wastewater Treatment* projects can include temporary construction impacts, visual impacts from above-ground facilities, impacts to the hydrograph due to changes in land use patterns, density and/or imperviousness of the land, and potential water quality impacts to ambient waters from process waste streams. Operation of *Water and Wastewater Treatment* facilities can also result in noise, vibration, and air quality impacts from operation of power generators, and may also create odor issues.

Benefits from *Water and Wastewater Treatment* include protection of human health, protection of the quality of receiving water bodies and therefore protection of riparian and aquatic species. Implementation of *Water and Wastewater Treatment* projects may also support several beneficial water uses as defined by the *San Francisco Bay Basin Plan* including, but not limited to: industrial service supply, and municipal and domestic water supply.

H.2.20 Water Transfers Impacts and Benefits

Potential impacts from *Water Transfers* include growth-inducing impacts of having another water supply source and third party impacts.

Potential benefits of *Water Transfers* include additional *Water Supply Reliability*, operational flexibility, and beneficial use of surplus irrigation water supplies. Implementation of *Water Transfer* projects may also support several beneficial water uses as defined by the *San Francisco Bay Basin Plan* including, but not limited to: industrial service supply, and municipal and domestic water supply.

H.2.21 Interties Impacts and Benefits

Potential impacts from *Interties* include temporary construction impacts, and impacts to land use and habitat in areas where *Intertie* facilities are constructed.

Benefits of *Interties* include improved *Water Supply Reliability* during emergencies, such as catastrophic earthquakes, electrical outages, sabotage, etc. Implementation of *Intertie* projects may also support several beneficial water uses as defined by the *San Francisco Bay Basin Plan* including, but not limited to: industrial service supply, and municipal and domestic water supply.

H.2.22 Infrastructure Reliability Impacts and Benefits

Infrastructure Reliability projects will have construction related impacts, and impacts to the land use and habitats of the areas where the facilities are constructed.

Benefits of *Infrastructure Reliability* projects include improved *Water Supply Reliability*, reduced worker and public safety risk, improved operation and efficiency, and reduced risk of damage and/or outage during catastrophic events (e.g. earthquake or sabotage).

H.2.23 Regional Cooperation Impacts and Benefits

Regional Cooperation projects involve collaboration of water resource management entities throughout the Bay Area. This strategy recognizes and formalizes the importance of regional coordination in achieving sustainable water resources management. Similar to the *Land Use Planning* and *Watershed*



Planning impacts discussed above, projects proposed through the *Regional Cooperation* strategy are strategic by nature and therefore do not result in adverse impacts to the environment.

Implementation of *Regional Cooperation* as a project component enables achievement of all of the potential benefits accrued by the water management strategies in this section. Additionally, there are lessons learned and efficiencies that result from such an integrated planning process. *Regional Cooperation* projects support almost of the beneficial water uses as defined by the San Francisco Bay Basin Plan.

H.2.24 Education and Outreach Impacts and Benefits

Education and Outreach projects may include addition of interpretive signage at local or regional parks, docent-led tours of watershed resources sites, or elementary school programming about watershed ecology. *Education and Outreach* projects can also be volunteer-based learning, such as invasive plant removal or native replanting in local creeks and wetlands. Projects that focus strictly on education and do not include any capital costs are unlikely to have adverse impacts. Projects that do include capital improvements or on-the-ground actions may have temporary construction-related impacts. As projects are intended to educate and improve overall watershed health, other direct adverse impacts are unlikely to occur.

Implementation of *Education and Outreach* projects teach the Bay Area population about local natural resources, how watershed systems work, and what people can do on a daily basis to reduce pollution and encourage watershed health. Benefits derived from *Education and Outreach* projects include community stewardship and social investment in continued watershed health. Direct benefits of volunteer activities include improvements to local aquatic and riparian habitat areas, and potential subsequent improvements in special status species populations. Projects that educate the population about *NPS Pollution Control* or vegetating exposed slopes may lead to an overall improvement in regional water quality. As such, projects implemented may support almost all beneficial water uses as defined by the San Francisco Bay Basin Plan including, but not limited to: freshwater habitat, marine habitat, and water contact recreation.

H.2.25 Monitoring and Modeling

Potential adverse impacts related to implementation of *Monitoring and Modeling* projects are mainly associated with physically accessing an environmentally sensitive area to conduct monitoring activities. Potential impacts may include temporary degradation of wildlife habitat, and short-term disturbance of wildlife as a result of human presence. Modeling projects are unlikely to have any adverse environmental impacts given that most modeling projects involve computer-based applications. If modeling projects require field research, impacts could be similar to those described above.

Implementation of *Monitoring and Modeling* projects will lead to a better understanding of watershed and water quality conditions, hydrograph and flow patterns, water supply reliability, and wildlife populations and movement. Such projects often provide direction for future capital projects. Implementation of projects that focus on improving watershed health may support all of the beneficial water uses as defined by the San Francisco Bay Basin Plan.

H.2.26 Groundwater Banking Impacts and Benefits

Impacts associated with *Groundwater Banking* programs include potential growth-inducing impacts associated with a more reliable water supply.

Benefits of *Groundwater Banking* include improved drought supply reliability and operational flexibility and efficiency. Implementation of *Groundwater Banking* projects may also support several beneficial



water uses as defined by the San Francisco Bay Basin Plan including, but not limited to: industrial service supply, and municipal and domestic water supply.

H.3 Specific Project Impacts and Benefits

Common construction-related impacts that may occur with Cohort 1 projects are describe below. Specific project benefits are also described, as provided by the project description and purpose.

H.3.1 Construction-Related Impacts

Many of the Cohort 1 projects involve construction of new water resources infrastructure or significant upgrades to existing infrastructure. Construction-related project impacts include the range of disruptions that occur during ground-breaking activities. Such projects necessarily incur a variety of temporary, localized construction impacts, including the following:

- *Transportation.* Construction of proposed projects may result in temporary lane closures, detours, closure of transit stops, and the addition of construction trucks and equipment on the surrounding roadway system. Construction may potentially increase delays and congestion.
- *Air Quality.* Construction-related increases in PM10 and ozone precursor emissions may result from operation of construction equipment, vehicles, and airborne dust during site grading and/or excavation.
- *Noise.* Construction noise and vibration impacts may result from construction equipment, vehicles, and activities.
- *Water Resources.* Construction of proposed projects may result in increased erosion and sediment delivery to waterways in the vicinity of project sites, temporary changes in the watershed's hydrograph, or other impacts associated with construction activities that may degrade water resources.
- *Hazardous Materials.* Project construction could result in spills of fuel, lubricants, pesticides, or other substances used in construction equipment.
- *Aesthetics.* Construction activities may require the use of heavy equipment and storage of materials in the construction zone, which may constitute negative aesthetic elements.
- *Biological Resources.* Construction associated with proposed projects may result in the direct loss or indirect disturbance of special-status plants and wildlife species that are known to or could occur in the region. Construction-related impacts may also include temporary unavailability and/or degradation of wildlife habitat, and short-term disturbance of wildlife as a result of construction noise. These impacts may result in a reduction in local population size, lowered reproductive success, and/or habitat fragmentation.
- *Cultural Resources.* Numerous potential cultural resource sites are known to occur in the Bay Area. Potential impacts to unknown cultural resources may occur within construction footprints.

Potential adverse impacts of all water resources management projects will be evaluated through that project's CEQA process and mitigated as appropriate.

H.3.2 Project Benefits

Due to their nature as water resources management and enhancement activities, the priority projects all have environmental and social benefits. Table H-1 describes the potential regional benefits associated with the Cohort 1 projects and programs that were identified as short-term priorities for Plan implementation. Descriptions of each project are provided in Section D: *Water Management Strategies*.

**Table H-1: Project Impacts and Benefits**

	Project Name	Project Benefits
1	Adobe Bridge Culvert Removal Project (City of Pacifica)	The project will provide access for steelhead to better quality habitat in the upstream reaches, improve juvenile survival during the low flow summer/fall season, and reduce flooding in and around the surrounding neighborhood.
2	Adobe Creek Upper Reach 5 Restoration (SCVWD)	The project will reduce the extent and quantity of overland flooding on the site, and improve habitat quality.
3	Alameda County Partnership for Land Conservation and Stewardship (Alameda County RCD)	The program will benefit the region's agriculture and open space values ('working landscape') by providing increased outreach and education for landowners and organizations about conservation easements and resources for stewardship; acceleration in number and size of conservation easements in Eastern Alameda County; new cost-share partners and funds for landowners with resources enhancement projects, and, thus increased working landscape enhancement and restoration; county-wide liaison and assistance between conservation funders and local conservation groups and, thus increased resources enhancement and restoration; new conservation tools to provide incentives and cost-share and assurances for private landowners performing resources enhancement projects, and, thus increased working landscape enhancement and restoration.
4	Alameda Creek Fishery Enhancement Project (SFPUC)	The project will enhance fisheries in Calaveras and Alameda Creeks.
5	Alhambra Creek Restoration and Environmental Education Collaborative (ACREEC): John Swett Campus (Muir Heritage Land Trust)	The project will create riparian habitat, increase riparian plant cover, and offer refuge for birds and other animals; trap particulate pollutants originating from urban storm water runoff, minimize the amount of sediment being sent downstream by reducing erosion; include construction of a trail, complete with outdoor child and adult benches, and native riparian plants; and facilitate environmental education opportunities. This project will demonstrate an innovative approach to urban storm water runoff for the community. The project will extend the achievements and momentum of the ACREEC collaboration.
6	Alhambra Valley Creek Coalition Restoration Project (Urban Creeks Council)	This project will provide multiple benefits related to habitat restoration for steelhead trout, flood control, and water quality (as bank erosion in this area is exposing septic system leachfields and contributing to high bacterial levels in the creek). This project is the result of a coming-together of 47 neighbors interested in addressing their individual bank erosion concerns with a watershed approach. Water quality benefits will include sediment management and bank erosion management near septic system leachfields. Habitat benefits will include native riparian plantings and fish passage for resident steelhead trout. The project will also benefit a cultural resource by stabilizing the creek at the location of the John Muir grave in the National Park Service John Muir Historic Site.
7	Annadel State Park Erosion Control: Geary Ranch Road to Trail Conversion (California State Parks)	The project will provide sustainable, environmentally-friendly trails and public access; reduce erosion being caused to a significant tributary to Matanzas Creek; restore stream turbidity and spawning habitat for fisheries; protects and enhances oak woodland; and protect prehistoric and historic resources.
8	Antioch Recycled Water Implementation (DDSD)	This project will provide the benefits of reducing dependence on imported water supply, providing a drought proof irrigation supply for local parks and golf courses, and reducing wastewater discharges to New York Slough.
9	Bair Island Restoration and Management Plan (Don Edwards San Francisco Bay National Wildlife Refuge)	The project will benefit threatened and endangered species, migratory birds, aquatic species, water quality, and public access.
10	Bay Area Levee Certification (SCVWD)	The project will benefit public health and safety, flood control, long-term land use planning, and economic impacts of requiring flood insurance for thousands of parcels that had previously been exempt.
11	Bay Area Regional Water Conservation Program (SCVWD)	The benefits of this project will include improved water supply reliability through conservation. In addition, this project includes long-term, ongoing regional conservation initiatives throughout the region, including implementation of additional projects and programs in future years.
12	Bay Water Desalination Plant (MMWD)	The project will provide a new reliable, drought-proof source of water for MMWD customers to avoid severe rationing.
13	Beaver Pond Habitat Enhancement Project at the Dow Wetland Preserve (Contra Costa RCD)	Project benefits include enhancements to wildlife habitat in the lower Kirker Creek Watershed; improved water quality through increased infiltration; involvement of a diverse group of volunteers in field-based learning and restoration, and increased collaborative partnerships both regionally and within the watershed. Benefits to wildlife include the addition of cover, nesting, and forage areas; improvement to soil quality; an increase in the diversity of native vegetation and habitat structure; and creation of new wildlife corridors. Benefits to fisheries include improved water quality; increases in the diversity of benthic taxa; and reductions in water temperature along the bank. Social benefits include creation of environmental education opportunities; community service and stewardship opportunities; and collaborative partnerships.



	Project Name	Project Benefits
14	Benicia Water Reuse Project (City of Benicia)	The project would supply up to 2 million gallons per day of high purity recycled water to the Valero Refinery for use as cooling tower make-up water, significantly reducing discharges to the Carquinez Strait and replacing up to 2,240 acre feet annually of State Water Project demand with a drought-proof supply.
15	Calabazas Creek, Miller Avenue to Wardell Road (SCVWD)	This project will provide one-percent flood protection for the project area, restore the creek through the repair of the eroded channel, stabilize banks, remove accumulated sediment, improve fish passage, and provide environmental benefits to the creek ecosystem.
16	Canal Encasement Phases II and III (CCWD)	The project will improve source water quality at the CCWD's Rock Slough intake by hydraulically isolating the high saline groundwater from the Canal. The project will encase approximately 4 miles of unlined Canal.
17	Candlestick Point State Recreation Area Yosemite Slough Restoration Project (California State Parks)	The project will restore wetlands and wildlife habitat, clean up chemically impacted areas in Candlestick Point SRA, and provide recreational and educational access to the park's waterfront.
18	Codornices Creek, Kains to San Pablo (Friends of Five Creeks)	This project will restore approximately 100 linear feet of creek habitat for anadromous fish, create a mini-park (with trail and interpretive signs) for the adjacent to a low-income housing project, and lessen flood potential by restoring a flood plain and increasing storage.
19	Community Safe Drinking Water Project (Literacy for Environmental Justice)	Through this project Literacy for Environmental Justice will work with appropriate agencies, tenants associations, and local communities to test drinking water in neighborhoods in the Bay View Hunters Point District of San Francisco. Youth and others will participate in a training program to be certified as testers according to appropriate state and local regulations. The certified team will educate the community about these important issues, visit homes randomly pre-selected and help to determine where drinking water at the tap is not meeting water quality guidelines. Following results, steps will be taken to investigate the cause and identify remedies to ensure safe drinking water supplies for the community through a collaboration of agencies and local organizations.
20	ConocoPhillips High-Purity Recycled Water Project (EBMUD)	This project will deliver about 2 mgd of high-purity recycled water to the refinery's boiler feedwater system to substitute for its potable water use.
21	Corte Madera Creek Watershed Infiltration and Storage Assessment (Friends of Corte Madera Creek Watershed)	The project will create approximately 78 acre-ft of temporary stormwater storage through detention and infiltration; include planning, design, and permitting work toward augmenting and using available flood storage in MMWD's existing Phoenix Lake Reservoir on Ross Creek; and streamline the permitting and standardize the engineering for installing above-ground on-site runoff rainfall storage facilities and in-ground vegetated swales. The project will create 3,500,000 gallons of above-ground rainfall storage on institutional, commercial, and residential sites that can be used for seasonal landscape irrigation in lieu of water supply deliveries from MMWD. The project will improve water quality by reducing flooding and the attendant degradation of water quality from erosion and sewage spills; improve water quality by providing cool inputs to streamflow in the summer; and initiate changes to parking lots, playing fields, and other sites for enhanced infiltration and storage and disruption during construction. An additional benefit could be reduced summer water use of Marin Municipal Water District's domestic water supply if stored water were used for irrigation.
22	Corte Madera Creek Watershed Models (Friends of Corte Madera Creek Watershed)	The project will help assess how changes in coverage by impervious surfaces or by development of retention would affect peak flows and timing, either improving or worsening likelihood of flooding. It will evaluate effectiveness of structural alternatives (e.g., bypass channels, channel widening) that would decrease the frequency of flooding; clearly identify the trade-offs between achieving optimal flood protection and effects on public and private property and environmental resources; and facilitate selection of preferred projects. It will also help with planning of water quality monitoring studies by bounding the extent of tidal influence.
23	Corte Madera Creek Watershed Plan (Friends of Corte Madera Creek Watershed)	Projects to improve flood management, water quality, and habitat are more likely to be implemented if they are identified in a watershed plan that is supported by the community. The plan will prioritize actions and facilitate cost-benefit assessments.
24	CreekWise Creek Care Education Program (San Mateo STOPPP)	The Creek-Wise Program will offer direct benefits to creekside property owners by offering relevant information and resources. It will also provide indirect benefits to residents who do not own creekside properties by developing a broad-based understanding of watershed management issues including, but not limited to: protection of property rights, endangered species protection, protection of local water supplies, land use practices, water quality, flood hazards and emergency response, and the effects of urban development on natural processes.
25	Defining Summer Low Flow Channels (SCC)	Benefits of this project will include water quality; riparian habitat; species support; improved water resource management; and flood improvements.



	Project Name	Project Benefits
26	Developing and Implementing Options for Mitigating Risks of Public Health Impacts of Eating Fish (Clean Estuary Partnership)	Benefits of this project will include identification of populations at risk of detrimental effects associated with consumption of fish from San Francisco Bay, outreach and education to potentially affected groups, and identification of appropriate actions to mitigate risk.
27	Development of Regional GIS for Watershed Planning (San Mateo C/CAG)	This project will enhance watershed planning and hydrologic modeling for all participating municipalities within the Bay Area to provide a foundation for understanding the factors involved in improving flood protection, ecosystem health, and natural waterway processes.
28	East Bayshore Recycled Water Project – Phase 1B (EBMUD)	This project will provide up to 2.5 mgd of recycled water to customers within the cities of Alameda, Albany, Berkeley, Emeryville, and Oakland, including the disadvantaged community of West Oakland.
29	EBMUD-CCWD Raw Water Intertie (CCWD)	This project will increase system flexibility and allow for more effective sharing of the available regional water supplies during emergencies (e.g. earthquakes, droughts, outages).
30	EBMUD-SFPUC/Hayward Emergency Intertie (EBMUD)	This project will increase system flexibility and allow for more effective sharing of the available regional water supplies during emergencies (e.g. earthquakes, droughts, outages).
31	Feasibility Study for Dry-Year Water Supply (City of Napa)	The project will study the feasibility, environmental impact, economics, and reliability of acquiring long-term dry-year water transfers from State Water Project Contractors, Sacramento River Users, and other water users to meet dry-year water supply needs in Napa County.
32	Fisheries and Aquatic Habitat Collaborative Effort (SCVWD)	The project will provide significant benefit to the fisheries of Santa Clara County by improving habitat, improving flow conditions (quantity, temperature and timing) and improving fish passage. The collaboratively-derived resolution of the water rights complaint will benefit local water supply by increasing operational certainty, having proactively addressed potential future water-rights challenges. Energy savings will be realized by protecting the county's local supply of water, thereby helping to manage the amount of water imported.
33	Groundwater Optimization Project (MWSD)	Benefits of this project will include characterizing groundwater resources and evaluating their suitability for potable water uses, thereby increasing water supply reliability. In addition, water quality data obtained will extend the regional groundwater assessment work already conducted by San Mateo County.
34	Groundwater Recharge Opportunities (Sonoma CWA)	The project will contribute to long-term identification and construction of groundwater recharge facilities; likely enhancement or creation of wetlands habitats; improved creek base flows; recreational opportunities through open space protection or park enhancement or creation; and reduction of peak flood flows.
35	Guadalupe River Watershed Habitat Enhancement (SCVWD)	The project will benefit riparian vegetation and instream habitat, terrestrial flora and fauna, and instream aquatic species, most notably western pond turtle and steelhead. Benefits will also be realized for water supply, as appropriate-sized gravel will be removed from the in-watershed water-supply reservoir to be used for spawning habitat downstream. This will increase reservoir storage and increase water supply reliability.
36	Guadalupe Watershed Modeling Towards Mercury Management to Achieve TMDL Goals (San Francisco Estuary Institute)	The project will have far reaching benefits and impacts for management of mercury in the Bay Area region. Locally, the project will help Stakeholders to determine the best actions to reduce water body impairment from mining activities and urban runoff in the Guadalupe River system. On a regional basis, the Guadalupe River watershed is the second largest external input of Hg to San Francisco Bay. Reducing mercury load from the Guadalupe River watershed will likely help to improve water quality in SF Bay and perhaps reduce methylation of Hg in wetland environments downstream of Guadalupe on the Bay margin.
37	Infrastructure Reliability Improvements in Santa Clara County (SCVWD)	This program will provide increased water supply reliability by implementing the improvement projects contained in portfolio 2 of SCVWD Water Infrastructure Reliability Project and the associated improvements in retailers' systems.
38	Intertie w/ NBA-Solano Project (Solano CWA)	This project will increase system flexibility and allow for more effective sharing of the available regional water supplies during emergencies (e.g. earthquakes, droughts, outages).
39	Ironhouse Sanitary District Wastewater Conveyance to San Francisco Region (Ironhouse Sanitary District)	Because New York Slough is higher in salts due to the tidal influence from San Francisco Bay, this project will reduce the receiving water impact, benefiting receiving water quality. In addition, this project will contribute to improved water quality in the Contra Costa Canal.
40	Jack London Lake Restoration and Sedimentation Reduction (California State Parks)	This project will reduce erosion, repair damage being caused to a significant tributary to Sonoma Creek, improve water quality in high quality riparian systems, and restore potential spawning habitat for anadromous species.
41	Jamieson Treatment Plant Improvements (City of Napa)	The project will improve the reliability, capacity, and efficiency of the treatment plant to adequately treat existing entitlements from the State Water Project for Napa County agencies.



	Project Name	Project Benefits
42	Kirker Creek Watershed Greenway Park Plan (Contra Costa RCD)	The project will develop a community-supported plan to preserve, enhance and restore valuable natural resources in an urbanized watershed; identification of projects with multiple benefits (including flood-control, water quality, and wildlife habitat, among others); and identify specific projects and cost estimates that will facilitate the receipt of grant funds to implement on-the-ground projects.
43	Kirker Creek Watershed Nursery (Contra Costa RCD)	Social benefits will include unique environmental education opportunities; greater community involvement in watershed activities; and resources and instruction for teachers and students. Restoration benefits to wildlife will include addition of cover, nesting, and forage areas; improvement to soil quality; increase in the diversity native vegetation and habitat structure; and creation of new wildlife corridors connecting upland and wetland habitats. Restoration benefits to fisheries will include improved water quality; increase in the diversity of benthic taxa; and lowering of water temperature along creek and pond banks.
44	Lake Merritt and Lake Merritt Channel Improvements (City of Oakland)	The expanded tidal exchange created by the culvert removal at 12th and 10th Streets will improve water quality conditions by flushing larger volumes of water in and out of the lake. In addition, the increased tidal range will improve future opportunities for wetland creation in the Channel and within the Lake. The restoration elements within the 12th and 10th Street Project reverse the trend of wetland filling and damped tidal exchange with Lake Merritt. The project provides multiple benefits by reducing pollutants, merging water quality and habitat objectives, and strengthening outreach and awareness. This project addresses the overall water quality and habitat value of Lake Merritt, the Channel, and by extension the Oakland Estuary.
45	LEAD at Crockett (EBMUD)	This project will provide increased water supply reliability by producing 1.5 MGD of potable quality water for use by the food processor through desalination. This will offset 1.5 mgd of potable water usage for EBMUD customers.
46	Ledson Marsh Restoration: Annadel State Park (California State Parks)	This project will benefit a significant population of federally-threatened California red-legged frogs, who depend on the marsh habitat for their survival in Annadel State Park, as well as other native wildlife species. This project will reduce erosion of earthen dam material being carried directly into the creek, degrading water quality. Additional benefits will include increased educational opportunities through interpretive panels that explain the importance of the marsh ecosystem to frogs and other wildlife; and improved aesthetics of a popular natural area that thousands of people visit every year.
47	Livermore-Amador Valley Mocho Groundwater Demineralization Project (Zone 7)	Benefits of this project will include allowing for expanded use of recycled water while protecting Zone 7's potable groundwater supplies by offsetting salt loadings from proposed recycled water uses through the use of reverse osmosis wellhead treatment – a recommendation of Zone 7's Salt Management Plan.
48	Lomita Canal / Cupid Row Canal Upgrades (San Francisco International Airport)	Benefits will include improved habitat for the California Red-Legged Frog and San Francisco Garter Snake as well as improved stormwater run-off flow from Millbrae in the Lomita Canal.
49	Lower Silver Creek, Reaches 4-6 (SCVWD)	This project will improve stream management and habitat, flood control and water quality.
50	Marin County Benthic Macroinvertebrate Sampling Program (Marin County STOPPP)	The BMI Program is a relatively cost effective way of assessing the water quality condition and the habitat health within the watersheds of East Marin County. This program will provide a long-term data source of BMI and physical habitat data. The data can be used to help prioritize restoration efforts and the BMI program facilitates local community interaction.
51	Martinez Adult Education Campus Creek Project Enhancement (Muir Heritage Land Trust)	This project will provide protection from flooding damage; enhance habitat values by increasing set-back from the top of bank to a significantly enlarged the riparian zone; increase pervious area in the watershed; improve water quality by minimizing runoff from the parking lot; and provide educational opportunities.
52	Milpitas Transit Area Recycled Water Project (City of San Jose)	Local benefits of the project will include reducing the discharge of wastewater effluent into the South San Francisco Bay, protecting endangered species and salt marsh habitat and eliminating the introduction of trace levels of heavy metals and pesticides into the Bay. Other local benefits will include the provision of an additional supply of locally manufactured "drought-proof" water. On a regional basis, the development of alternative water supplies will have an incremental effect of improving Bay-Delta conditions and enhancing watershed management. Additionally the use of recycled water for irrigation within areas of residential land use will reinforce public recognition of the appropriateness of recycled water use.
53	Mirant Cooling Recycled Water Project (DDSD)	Benefits of this project will include decreased dependency on Delta water supplies by replacing some or all of the Delta drawn water with recycled water for industrial cooling and other process uses.
54	Monitoring Well Construction and Water Quality Monitoring Program (ACWD)	This project will enhance groundwater protection by replacing privately owned wells in the critical areas of the Niles Cone Groundwater Basin with dedicated monitoring wells to allow for monitoring of groundwater levels and quality, and identify any potential seawater intrusion.



	Project Name	Project Benefits
55	Mountain View / Moffett Area Water Recycling Project (City of Palo Alto/City of Mountain View)	This recycled water distribution system will serve approximately 120 customers within the Mountain View and Moffett Field Area, offsetting potable supplies.
56	Mt. Diablo Creek Watershed Coordinated Steelhead Passage Project (Natural Heritage Institute)	This project will complete the necessary planning, technical studies, design work and physical modifications to implement steelhead trout passage throughout Mt. Diablo Creek watershed. At the completion of the project, steelhead passage will be restored to 15 miles of excellent steelhead habitat. In addition to passage, this project will eliminate a public health nuisance, a flooding problem, an impediment to operations of the Mokelumne Aqueduct, and restore necessary sediment inputs into a subsiding tidal marsh. This project will benefit the following beneficial uses: COLD, RARE, MIGR, and SPWN.
57	Mt. Diablo State Park: Comprehensive Stock Pond Evaluation and Sedimentation Remediation (California State Parks)	This project will benefit wetland enhancement, endangered species habitat improvement, erosion control and sedimentation reduction, as well as overall watershed restoration. By evaluating and addressing each pond site, erosion and environmental damage can be identified and corrected, and important wildlife habitat can be protected and enhanced. Continued downcutting of dam spillways and headcutting above spillways also delivers a large, yet unquantified amount of sediment. Without habitat assessment and species surveys, substantial permitting and regulatory issues will arise and perhaps prevent treatments to remediate sedimentation risk. Reducing sedimentation from the old pond sites will improve water quality and wildlife habitat in all of these watersheds.
58	Mt. Diablo State Park: Mitchell Creek Riparian Restoration (California State Parks)	This project will benefit water quality, riparian habitat, and native species. Water quality will be improved as this project repairs a number of erosion sites, reducing sediment delivery to the creek. This project will restore riparian habitat by improving the hydrologic function of the creek, restoring floodplains and aquatic habitat, and providing areas for riparian vegetation to become re-established. Increased riparian cover will shade the creek and lower water temperatures, allowing for more dissolved oxygen and overall improved habitat for native rainbow trout. Improving riparian habitat along Mitchell Creek will result in an improved recreational experience and community stewardship.
59	Napa Plant Site Restoration Project (CDFG)	This project will benefit threatened and endangered species, migratory birds, aquatic species, water quality, flood management, and public access.
60	Napa Salt Marsh Restoration Project (State Coastal Conservancy)	This project will restore salt ponds in the Napa-Sonoma Marsh Wildlife Area resulting in a mosaic of diverse habitats that will benefit a broad range of fish, wildlife, and plant species, including endangered and threatened species and migratory shorebirds and waterfowl.
61	Nathanson Creek Preserve Restoration Project (Sonoma Ecology Center)	Direct project benefits will include improved riparian and aquatic habitat quantity and quality; improved water quality; improved flood conveyance; reduced rates of erosion and loss of valuable floodplain property; increased public access, ecological and water use awareness, and recreational value. By creating an environmental amenity (a day trip destination) in this part of Sonoma for locals and tourists, this project will also create many indirect benefits, including increased activity at local retail and service businesses along the Broadway Corridor; increased property values; improved perceptions of safety; and community health benefits.
62	North Solano Groundwater Monitoring (Solano CWA)	For this project a series of multi-level groundwater monitoring wells and subsidence monitoring stations will be installed in eastern Solano County to get data to improve knowledge of conjunctive use opportunities and to provide data for groundwater modeling.
63	Pacifica Recycled Water Project (North Coast County Water District)	Benefits of this project will include increased water supply reliability, preservation of the highest quality water for potable uses and other appropriate customers demands, and reduced dependence on SFPUC Regional System by replacing water supply currently provided by the SFPUC Regional System.
64	Palo Alto Recycling Project (City of Palo Alto)	This project will serve recycled water produced at the RWQCP to the City of Palo Alto, primarily to customers located within a centralized area known as the Stanford Research Park area, offsetting potable supplies.
65	Palo Alto Regional Water Quality Control Plant Water Recycling Program - Phase 3 Expansion (City of Palo Alto)	The Project will add infrastructure to deliver 1000 AFY supply to Palo Alto and add 4+ mgd peak day Title 22 production capacity. In addition, the Project will reduce recycled water salinity to 400 mg/L to improve customer satisfaction, provide groundwater protection, and reduce pollutants to the Bay.
66	PCBs Investigation at the Pulgas Creek Pump Station Watershed, San Carlos, California (San Mateo C/CAG)	Bay Area researchers and water quality managers believe that urban runoff from industrial areas with contaminated soils and sediments is a major source of PCBs to San Francisco Bay. This project will help to cleanup one such source area and would develop methods that could be applied to cleanup other industrial watersheds. Addressing PCB source areas will help reduce PCBs levels in stormwater flowing to the Bay and contribute to the Bay's clean up of PCBs. A human health benefit related to direct exposure to PCBs will also potentially be realized by residents and workers in the watershed.
67	Peacock Gap Recycled Water Extension (MMWD)	This project will provide recycled water to Peacock Gap Golf course and several other users along the pipeline route, in order to offset potable water use and to reduce pollutant loading into the San Francisco Bay.



	Project Name	Project Benefits
68	Peralta Tyson Groundwater Treatment Facility (ACWD)	This project will increase water quality and supply by providing advanced treatment (reverse osmosis) of water extracted at ACWD's well fields.
69	Permanente Creek Flood Protection (SCVWD)	The project will reduce flooding for a large number of parcels in Mountain View and could be enhanced to also protect the community of Los Altos. The project will also potentially restore thousands of feet of currently concrete channel to at least partially riparian function. Impacts are expected to be minimal, and will be mitigated to provide a net benefit to the ecological health of the riparian corridor.
70	PG&E Contra Costa Power Plant #8 Recycled Cooling Water (DDSD)	This project will reduce wastewater discharge to the Delta and mitigate power plant cooling system impacts to a less-than-significant level.
71	Phase 2 – Niles Cone Groundwater Recharge and Fish Passage Program (ACWD)	This project will provide access for anadromous fishery to 700 square-miles in Alameda Creek Watershed.
72	Pilarcitos Creek Integrated Watershed Management Plan Development and Implementation (SFPUC)	Restoring riparian habitat and flows in Pilarcitos Creek and its lagoon will benefit threatened aquatic and terrestrial species dependent upon this resource. Residents, businesses, and visitors to Half Moon Bay and San Mateo County Coastside will benefit from a sustainable water plan ensuring future economic stability. In addition to habitat restoration, the success of the long-term restoration of the creek is linked to better management of stream flows, water conservation, and the use of treated wastewater for non-potable purposes in the lower part of the watershed, delivered to the end-users safely and economically.
73	Pinole Creek Restoration and Greenway Park (CCC FC&WCD)	The project will increase amount and the diversity of habitat with trees, shrubs and other vegetation within the 30 acre flood way; improve public connection to the natural creek environment with habitat protection and interpretive elements; increase flood protection for the community; integrate two existing parks into a continuous greenway corridor; provide opportunities for environmental study by local schools; implement a beneficial reuse of treated water from the Pinole/Hercules Water Treatment Facility; and make significant habitat improvements for native anadromous fisheries, including removal a fish passage barrier at the Interstate 80 culvert.
74	Pittsburg Recycled Water Implementation (DDSD)	This urban reuse project will (1) reduce dependence on Delta supplies by replacing irrigation supplies with recycled water; (2) provide dry-year reliability for the irrigation customers; (3) preserve drinking water supplies for potable uses; (4) reduce wastewater discharges to the Delta; and (5) make use of available capacity within DDSD's Recycled Water Facility (RWF).
75	Protection from Tidal Flooding (City of Burlingame)	Reduction of tidal flooding will result in the following benefits: public health and safety; economic viability; recreational opportunities; flood control; long-term land use planning; mudflat and salt flat preservation; endangered and threatened species support; and regional planning and coordination.
76	R10-2 Arroyo de la Laguna (ADLL) Improvement Project 2 (Zone 7)	The project will improve in-stream bank stability, address bank erosion and stability, link ADLL to trail network, and provide for potential fisheries stream corridor.
77	R10-5 Arroyo de la Laguna Improvement Project 5 (Zone 7)	The project will improve a potential steelhead corridor, create a recreational corridor along ADLL, reduce future flooding to properties along downstream section of ADLL, and address stability of ADLL.
78	Recycled Water Conveyance Pipeline (Novato Sanitary District)	This project will provide recycled water to offset potable supplies at the Ignacio facility, and will result in a reduction in pollutant loading into the San Francisco Bay.
79	Recycled Water Program for North Marin WD & Novato Sanitary District – Phase 1 (North Marin Water District)	This project will provide 0.5 mgd recycled water facility for landscape irrigation at the Stone Tree golf course in Novato, offsetting potable demands.
80	Reducing Women and Children's Exposure to Mercury in the Bay and Delta Region (Ma'at Youth Academy)	Through partnerships with public officials and working together with extant mercury abatement efforts, this project will help combat the root source of toxic fish. Furthermore, the project's youth-empowerment model ensures that a new generation of activists will emerge to continue to improve community health.
81	Redwood City Recycled Water Project (City of Redwood City)	This project would enable Redwood City to stay within its contractual entitlement with SFPUC by initially providing up to 1687 AFY of recycled water for landscape and industrial applications, thereby reducing dependency on SFPUC supplies. The production and distribution systems have capacity to provide up to 3238 AFY, allowing for potential expansion and wholesaling to neighboring cities.
82	Regional Biosolids Project (Regional Biosolids JPA)	This project will provide a wide variety of benefits to the region, including economy of scale, sustainable beneficial reuse, reducing competition among agencies for marketing of similar products, and streamlining permitting. It is a project that is regional in nature, which stands to provide multiple benefits to the region.
83	Regional BMPs, Field Manual and Training for Stream Maintenance Activities (Marin County STOPPP)	The project will maintain flood channel capacity, while also benefiting existing flood channel habitat and water quality as a result of consistent implementation of standardized maintenance activities.
84	Regional Desalination Feasibility Study (EBMUD)	This project will explore developing regional desalination facilities that could benefit over 5.4 million Bay Area residents and businesses by increasing water supply.



	Project Name	Project Benefits
85	Regional Flood Agencies Forum (SCVWD)	This project will aid flood management agencies with conception, design, funding, and permitting of flood protection projects.
86	Removal of NDMA, EDCs, and PPCPs in South Delta Water (CCWD)	This project will evaluate the effectiveness of augmented conventional treatment trains and membrane-based treatment trains to remove contaminants of emerging concern (n-nitrosodimethylamine [NDMA], endocrine disrupting compounds [EDCs] and pharmaceuticals and personal care products [PPCPs]) in south Delta waters based on tests conducted at pilot scale.
87	Rheem Creek Restoration and Watershed Council Project (Natural Heritage Institute)	The restoration component of the project will immediately improve water quality by creating understory cover; reducing bank erosion and sediment load; and improving the creek's ability to naturally filter pollutants from stormwater runoff. The project will restore a degraded riparian corridor by removing invasive species and increasing diversity of native riparian vegetation. The formation of the Watershed Council will increase local capacity for watershed management in a minority community. Finally, the education program will increase local capacity by teaching students, teachers, and residents about watershed science and stewardship.
88	Richmond Advanced Recycled Expansion (RARE) Water Project (EBMUD)	The RARE Water Project will deliver 3 to 4 mgd of high-purity recycled water to the refinery's boiler feedwater system to substitute for its potable water use.
89	Richmond Bayshore Stewards (The Watershed Project)	The project will increase both the quality and quantity of habitat for the federally listed endangered California clapper rail, migratory waterfowl, and other wildlife species (Western Burrowing owl, Short-eared owl and salt marsh common yellowthroat); provide educational opportunities about the function and value of marshes and watersheds; and provide volunteers with the tools and knowledge to become active stewards of these ecosystems.
90	Robert Louis Stevenson State Park Erosion Control: Table Rock Trail Re-route (California State Parks)	This project will reduce erosion and sedimentation into streams inhabited by anadromous fish. By reducing sedimentation from the current trail alignment, this project will help to enhance water quality and wildlife habitat in the Napa River watershed. Additional benefits provided by this project will include preservation of an important trail corridor that is an essential trail link between popular destinations. Re-routing the trail protects prime historic, archaeological, geologic, scientific, and recreational resources from visitor trampling. The project will also involve educating visitors on erosion and sediment production caused by improperly aligned roads and trails.
91	Rollingwood Neighborhood Creek Restoration Project (Urban Creeks Council)	Local benefits will include reduced flooding and property damage, improved creek health, ecosystem benefits, and improved community value and quality of life in the lower income, predominately Latino community. This project will be a model of comprehensive creek restoration along a 1/3 mile stretch of privately-owned creek.
92	San Francisquito Creek Flood Damage Reduction and Ecosystem Restoration (San Francisquito Creek JPA)	The primary benefit of the project to the entire community will be the protection of life, property, business, special flora & fauna, and utility corridors from episodic flooding. The project aim is to remove 10,000 properties from FEMA flood insurance map areas, saving approximately \$800.00 per property/per year. Through sediment management, the project will provide benefits of improved water quality for species protection in creek and in tidal areas, bank erosion and incision, property loss for land owners and government agencies. The environmental/ecosystem restoration efforts of the project will support sustaining numerous listed and threatened species, as well improve conditions for thousands of resident species. Commerce of the entire Bay Area will benefit from completion of the project; important Bay Area transportation corridors are subject to flooding and loss of property due to erosion in this watershed. The project is likely to have localized, temporary impacts local traffic but is not anticipated to disrupt normal regional traffic flow.
93	San Leandro Tributaries at South Hills (City of Oakland)	Preservation of this area will protect headwater source areas that provide flood storage and water quality protection for downstream reaches, particularly downstream of Highway 580. The project will protect riparian habitat and adjacent California bay forest, which use the site as a foraging and movement corridor; as well as pool and riffle channel features typical of steep reaches near headwaters of the watershed. The riparian corridor also provides roosting and foraging habitat for numerous migratory bird species and foraging and nesting habitat for resident bird species. The project will also offer good educational and community stewardship potential.
94	San Leandro Water Reclamation Facility Expansion Project (EBMUD)	This new project will expand recycled water delivery by 30,000 gpd to irrigate the Oakland Airport's roadway landscaping, which currently uses potable water.
95	San Ramon Valley Recycled Water Program - Phase 2 and Future Phases (DSRSD-EBMUD Recycled Water Authority)	The San Ramon Valley Recycled Water Program will ultimately provide 5.7 mgd or 6,400 AFY of recycled water to the San Ramon Valley, offsetting potable supplies.



	Project Name	Project Benefits
96	Santa Clara Valley Water District Aquifer Storage and Recovery Project (SCVWD)	This SCVWD Aquifer Storage and Recovery Project will improve groundwater recharge and extraction capability in Santa Clara County in accordance with the recommendations of the District's Integrated Water Resources Plan (IWRP 2003) and Water Infrastructure Reliability Project Report (2005). Improved local groundwater recharge and extraction capability will enable SCVWD to better meet local demands during droughts or emergencies, improving reliability for local retailers and benefiting agencies outside Santa Clara County that rely on the same imported water sources. To the extent that the extraction wells can serve the eight retailers served by both the SFPUC and SCVWD, improved extraction capability can also enable the SFPUC to meet the demands of the eight common retailers during droughts and emergencies.
97	Satellite Recycled Water Treatment Plant Project (EBMUD)	This concept-level project will implement a permanent MBR treatment facility at the location of a new development in order to serve approximately 200,000 gpd or more.
98	SBWR Recycled Water Phase 2 Extensions--Santa Clara (City of San Jose)	Local benefits of the project will include reducing the discharge of wastewater effluent into the South Bay, protecting endangered species salt marsh habitat and eliminating the introduction of trace levels of heavy metals and pesticides into the Bay and sediment. Other local benefits will include the provision of an additional supply of locally manufactured "drought-proof" water. On a regional basis, extending recycled water service to high profile uses like Santa Clara Central Park and City Hall will further reinforce public recognition of the appropriateness of recycled water use, while providing recycled water to high tech companies will advance water reuse in industrial facilities for cooling and manufacturing. Furthermore, the development of alternative water supplies will have an incremental effect of improving Bay-Delta conditions and enhancing watershed management.
99	Sears Point Restoration Project (Sonoma Land Trust)	The project will provide significant new habitat acreage for endangered species such as the salt marsh harvest mouse, California clapper rail, and California red-legged frog. The project includes a new trail network, public access, environmental education, and volunteer-based stewardship activities. The project's new flood control network will improve local health and safety and significantly improve flood protection for local infrastructure and area residents. The project also includes remediation of lead-contaminated soils at a skeet range on the property.
100	SFPUC Groundwater Projects (SFPUC)	This project will balance groundwater supply with groundwater recharge. As part of the three projects incorporated in this project the SFPUC will increase local groundwater supply, offsetting water supplies from the SFPUC Regional System, and will develop a region groundwater supply to reduced normal-year groundwater pumping and allowing the groundwater basin to recharge naturally.
101	Sky Valley-Sulphur Springs Watershed Management Plan (City of Benicia)	A newly created Watershed Management Plan for the Sky Valley Open Space Area will preserve and protect an open space area that is critical to identified endangered species, as well as contribute to the overall water quality of the bay and other drainage basins.
102	Solano CWA Groundwater Banking/Conjunctive Use Program (Solano CWA)	This project will construct an Injection/Extraction Well and associated monitoring wells to increase groundwater banking and conjunctive use. In addition, it will determine the feasibility of larger scale conjunctive use project.
103	Sonoma Valley Invasive Weed Control (Sonoma Land Trust)	Project benefits will include increased habitat value, decreased risk of spreading invasive plants, improved riparian and aquatic resources for the listed Steelhead trout, and protection and enhancement of agricultural resources via reducing the spread of invasive plant species. Other benefits include increased community support and stewardship through education, outreach, and training.
104	South Bay Advanced Recycled Water Treatment Facility Project (SCVWD)	This project will solve South Bay Water Recycling salinity management issues and provide a testing platform to assess treatment strategies to support potential future SBWR and SCVWD water recycling initiatives. These initiatives include future expanded uses such as application of recycled water over regions in the County that have shallow, unconfined drinking water aquifers, new environmental enhancement uses via streamflow augmentation, and groundwater recharge.
105	South Bay Salt Pond Restoration Project & South San Francisco Bay Shoreline Study: Early Implementation Activities (SCC)	This project will benefit threatened and endangered species, migratory birds, and aquatic species, by restoring and enhancing habitats and improving water quality; Silicon Valley businesses, communities, and infrastructure by providing tidal and fluvial flood management; and hikers, bikers, waterfowl hunters, anglers, students, and photographers by opening up new areas for public access, including new Bay Trail segments.
106	Stanford Central Energy Facility Cooling Tower Recycled Water System (Stanford University)	The project will result in some savings in potable water demand; however, another important benefit will be the introduction of recycled water to the Stanford campus. This water conservation and alternative water supply approach will be necessary as demands increase, with the limitations on existing fresh water supplies. This project and its acceptance will enable other recycled water projects to be implemented on campus.
107	Stevens Creek Restoration at Blackberry Farm, Cupertino (SCVWD)	The project will benefit riparian habitat restoration; fish passage restoration; and over wintering habitat. It will stabilize over 3000 feet of Stevens Creek in the Blackberry Farm area; provide increased groundwater percolation; and enhance sediment transport balance.



	Project Name	Project Benefits
108	Sugarloaf Ridge State Park Erosion Control: Goodspeed Trail Rehabilitation (California State Parks)	This project will reduce erosion and repair damage being caused to a significant tributary to Sonoma Creek. This project will protect and enhance habitat for a rare <i>Ceanothus</i> species (<i>Ceanothus sonomensis</i> [Sonoma <i>ceanothus</i>], a rare CNPS List 1B plant, limited to the Sonoma County region. Wildlife habitat will be restored through this project by protecting the upland chaparral habitat which is home to countless mammal, bird, and reptile species. Trail stability will also prevent the irreplaceable loss of archeological resources, and preserve an important trail corridor that is an essential trail link between two publicly owned lands. This project will allow for the needed trail improvements and upgrades in order to arrest further trail degradation and surrounding resource damage due to erosion and 'volunteer trails.'
109	Sustainable Streets for Improved Stormwater Quality and Water Reuse (San Mateo C/CAG)	This project integrates stormwater quality, water conservation, and reuse, within a larger vision of new urbanism and transit oriented land use in order to create pedestrian friendly living and retail centers. The project will have significant benefits to stormwater quality by treating the runoff within the new project areas, conserving water by maximizing the reuse of stormwater for landscape irrigation and by using water conserving landscaping. The treatment of stormwater will contribute to reductions in total maximum daily load pollutants, such as mercury and PCBs, which are impairing water quality and posing a public health risk to people that eat fish from the bay. In addition, air quality and the indirect pollution of stormwater from vehicle emissions will be minimized by encouraging the use of mass transit, walking, and bicycles. Further, increasing the availability of housing in attractive areas that are accessible to public transit lessens urban sprawl into outlying counties.
110	Thompson Creek Stream Stabilization (SCVWD)	This project will provide the following benefits: the low flow channel within the project area will be restored to an equilibrium condition; the riparian corridor which is degrading rapidly will be restored; water quality will be improved and diverse stream habitats will be constructed; large scale erosion along the creek's banks will be halted which will decrease sediment removal maintenance operations downstream from the project reach; and the project planning phase will identify enhancement opportunities.
111	Upper Guadalupe River Project (Reaches 6 and 12) (SCVWD)	This project will prevent frequent flooding occurrences and improve existing stream habitat by diverting flood flows with erosive velocities into a new bypass channel. The new bypass channel will allow the existing channel to be planted with new, supplementary native riparian vegetation to shade the river and improve fishery habitat. The project will restore the channel (Reach 12) to a more functional and geomorphologically stable channel, and will reconfigure the former quarry areas to provide for improved percolation to the groundwater basin. The project will create more riparian and wetlands habitat to improve the stream habitat for fish and wildlife.
112	Urban Creek Trash Reduction Program (SCVWD)	Trash reduction accomplished through this project will provide for water quality improvement, flood flow conveyance improvement, ecosystem improvement, aesthetic treatment and proactive addressing of potential TMDLs related to trash loading in creeks.
113	Watershed Habitat and Project Mapping Program (San Francisco Estuary Institute)	The project will support watershed health assessment, conservation planning, and environmental planning of new projects. By enabling proposed projects to be viewed and planned in the context of other projects and affected habitats in the watershed and regional context, project designs can be adjusted to minimize negative impacts and maximize positive synergies with regard to all ecological services, energy demands, water demands, and security.
114	Westside Baseline and Harding Park/Lake Merced Projects (SFPUC)	The projects will construct treatment, storage, and distribution facilities to provide about 4 mgd of recycled water to customers on the west side of San Francisco, offsetting use of potable surface and groundwater supplies.
115	Wetland and Creek Restoration at Big Lagoon, Muir Beach (National Parks Service-GGNRA)	This project will provide substantial regional benefits since it will enhance habitat for the federally endangered coho salmon. This project will increase the flow conveyance of the channel, expand its functional floodplain, increase its sediment transport capacity, increase winter rearing habitat, and eliminate features which can cause fish stranding. Other regional benefits extend to the more than 400,000 annual visitors who will enjoy a more integrated ecosystem, with recreational facilities designed to be compatible with ecosystem protection. Stewardship and educational opportunities will be extended to the vast body of volunteers in the San Francisco Bay Area. The project will benefit local residents, whose access to their homes is obstructed annually by winter flood events.
116	Wildcat Creek Restoration (CCC FC&WCD)	The project will provide pacific coast steelhead habitat and encourage the reintroduction of their once active migration in Wildcat Creek. This project will also provide education opportunities for various community and school groups regarding the creek environment. The project will create some temporal impacts due to construction activities. In the long term, the project will reduce the frequency of maintenance operations, thus reducing the cumulative maintenance impacts.



H.4 Impacts and Benefits to Disadvantaged and Environmental Justice Communities

Sufficient analysis of the potential benefits and impacts of projects with respect to disadvantaged and environmental justice communities has not been completed to-date. The IRWMP CC and project proponents are committed to continuing to work with environmental justice groups to better define the potential impacts and benefits of IRWMP implementation as they relate to disadvantaged and environmental justice communities. Many of the projects included in the IRWMP and described above will benefit and/or impact disadvantaged and environmental justice communities in the Bay Area. Figure H-1 illustrates the locations of these communities in the region.

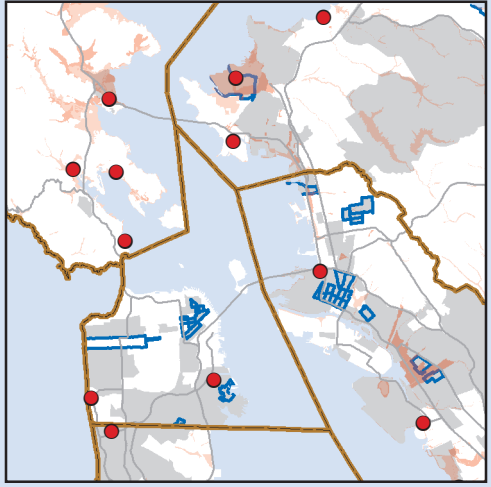
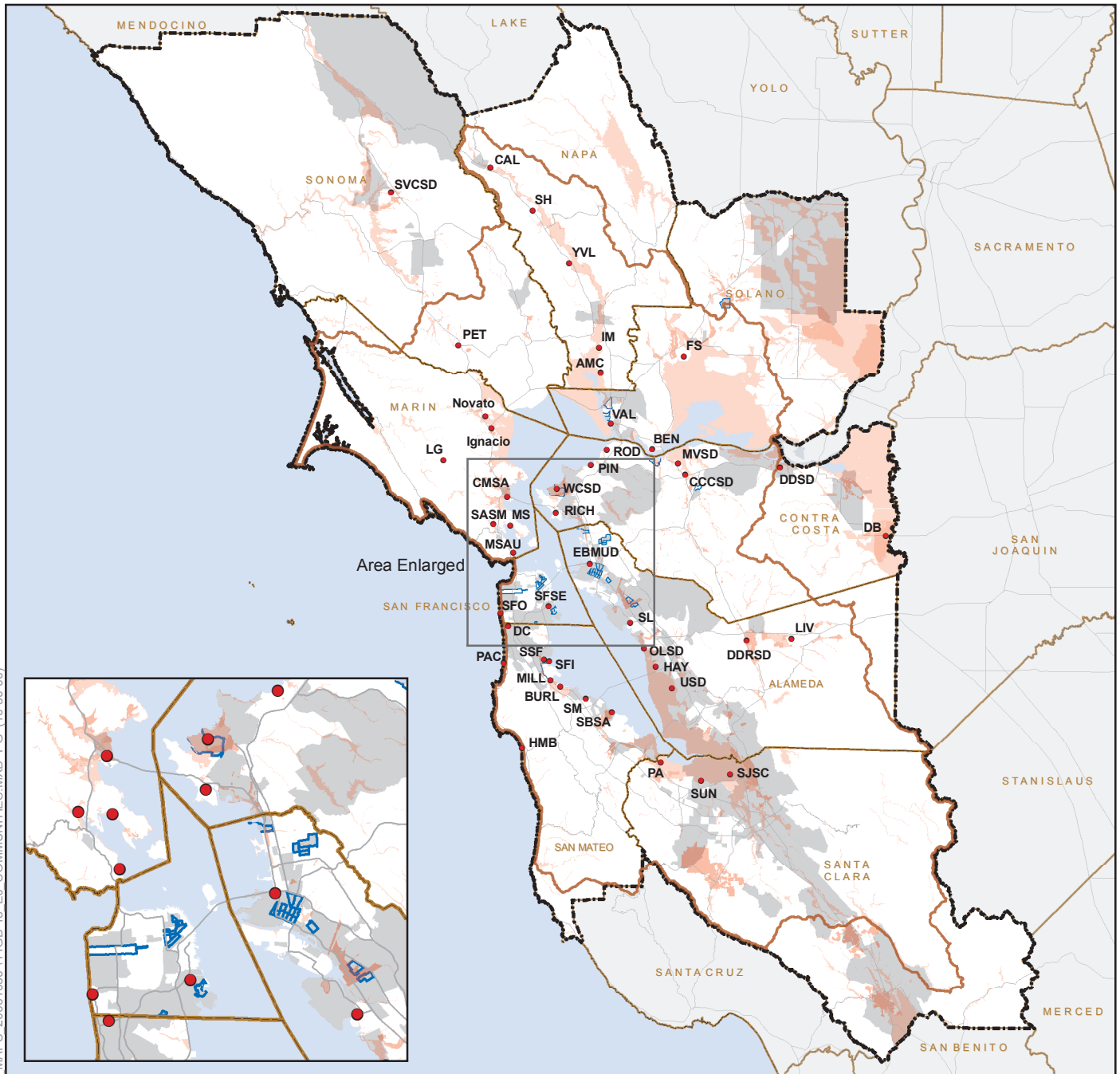
In identifying impacts and benefits of projects to disadvantaged and environmental justice communities, there is an overarching necessity to include these communities in that discussion. Projects that some agencies consider a benefit could be considered a negative impact by the adjacent community. It is imperative that project sponsors engage community members in early conversations about these projects so that these differing perceptions can be identified and addressed as the project is being planned. Potential adverse impacts identified by environmental justice advocates are provided in Appendix F.

Example projects that address disadvantaged and environmental justice communities' concerns include:

- Candlestick Point State Recreation Area Yosemite Slough Restoration Project
- Community Safe Drinking Water Project
- Developing and Implementing Options for Mitigating Risks of Public Health Impacts of Eating Fish
- Reducing Women and Children's Exposure to Mercury in the Bay and Delta Region
- Richmond Bayshore Stewards
- San Francisquito Creek Flood Damage Reduction and Ecosystem Restoration
- Rheem Creek Restoration and Watershed Council Project

As future work is completed, additional projects will be identified as benefiting and/or impacting disadvantaged and/or environmental justice communities throughout the region.

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Legend

- Disadvantaged Communities
- Minority Populations
- 100-year Floodplain
- 500-year Floodplain
- Wastewater Treatment Facility
- San Francisco Bay Area Region (Nine-County Area)
- Bay Area IRWMP Boundary
- Highways

N

0 10 20

Miles

Sources: US Census Bureau, 2000 Census
 U.S. Federal Emergency Management Administration (FEMA)
 California Spatial Information Library [<http://gis.ca.gov>]



H.5 Benefits of Regional Planning

In regional planning, individual agencies efforts are combined in order to leverage resources and meet multiple water resource needs at the same time. The result is a multi-objective approach that multiplies the benefits of any individual agency's single project. Collaboration strengthens regional clout, reduces conflict, increases benefits across the region, and may reduce costs for individual agencies.

Collaboration among water supply and wastewater agencies, flood control and stormwater protection districts, resource and regulatory agencies, NGOs, local governments, and volunteer creek groups is necessary to ensure genuine progress toward achievement of regional goals and objectives. Although individual agency and project-level contributions toward water supply reliability, water quality improvement, watershed and ecosystem health, protection from flood damages, and sustainability can indirectly accumulate over time, bringing together Bay Area agencies and organizations to reach consensus on regional goals and objectives will lead more effectively to project planning that directly contributes to success.

Regional collaboration can promote a more efficient, comprehensive and effective approach to water resources management, while being responsive within a regional context to the needs of individual communities and jurisdictions. As described in Section E: *Integration*, further benefits of integrated planning include the following:

- **Organizational Benefits.** Combining water management strategies can provide significant benefits, both *within* an individual organization and *among* multiple organizations collaborating on a given project or program. Increased support can be generated as proponents of different projects and aspects of water management are galvanized to accomplish a common goal. Further, bringing together multiple organizations to implement a common project encourages a broad-based support for project implementation that is difficult to achieve at a local level. Collaboration between agencies also eliminates redundancy and allows projects to be completed more quickly and effectively.
- **Geographic Benefits.** Multiple water management benefits can be achieved by grouping projects and programs with similar geographic and spatial considerations. Further, coordinated implementation of projects upstream and downstream within a watershed can provide economies of scale in project planning, by reducing redundancies. This can result in reduced project costs, while building cumulative benefits into the projects.
- **Synergistic Benefits.** Combining water management strategies can also result in synergistic benefits (i.e., benefits provided are greater than the sum of the parts). By combining multiple water management strategies within a single project, greater benefits can be achieved, often at less expense, than by implementing individual water management strategies independently.
- **Financial Efficiencies.** Integration of water management strategies across geographies, within project implementation, and through partnerships between agencies can result in significant financial efficiencies. Multi-benefit, collaborative projects can be widely supported, far reaching, and implemented better, faster, and cheaper than could be accomplished by a single agency focused on a single area of water management.