East Contra Costa County
Integrated Regional Water Management Plan

Update 2013

November 2013

East County Water Management Association

CONTRA COSTA WATER DISTRICT

City of Pittsburg

Delta Diablo Sanitation District

CITY OF ANTIOCH 1872 CALIFORNIA

THE CITY OF BRENTWOOD

Contra Costa County Flood Control & Water Conservation District

East Contra Costa County Habitat Conservancy

DIABLO WATER DISTRICT

DISCOVERY BAY "Live Where You Play"

IRONHOUSE SANITARY DISTRICT

ECCID

BYRON BETHANY IRRIGATION DISTRICT

http://www.eccc-irwm.org/

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Abbreviations and Acronyms

°F	degrees Fahrenheit
1996 Study	East County Water Supply Management Study in 1996
ACS	American Community Survey
Act	Integrated Regional Water Management Planning Act of 2002 (Act
ADWF	average dry weather flow
AF	acre-foot
AFY	acre-foot per year
BAB2E	Bay Area Biosolids to Energy Coalition
Banks	Harvey O. Banks Delta Pumping Plant
BBID	Bryon Bethany Irrigation District
BDCP	Bay-Delta Conservation Plan
BIMID	Bethel Island Municipal Improvement District
BMO	basin management objective
BMP	Best Management Practice
BWWTP	Brentwood Wastewater Treatment Plant
CALFED	California Bay-Delta Program
Canal	Contra Costa Canal
CASGEM	DWR's California Statewide Groundwater Elevation Monitoring Program
CCCCD	Contra Costa Community College District
CCCFCWCD	Contra Costa County Flood Control and Water Conservation District
CCCWA	Contra Costa County Water Agency
CCCWP	Contra Costa Clean Water Program
CCFCWCD	Contra Costa Flood Control and Water Conservation District
CCRCD	Contra Costa Resource Conservation District
CCWD	Contra Costa Water District
CDPH	California Department of Public Health
Central Valley Water Board	Central Valley Regional Water Quality Control Board
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CIHC	California Indian Heritage Center

COBWTP	City of Brentwood Water Treatment Plant
CPUC	California Public Utilities Commission
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CWC	California Water Code
CWP	California Water Plan
DAC	Disadvantaged Community
DDSD	Delta Diablo Sanitation District
DEC	Delta Energy Center
Delta	Sacramento-San Joaquin Delta
DGA	Data Gap Analysis
District	Town of Discovery Bay Community Services District
DO	dissolved oxygen
DRDWQMP	Delta Region Drinking Water Quality Management Plan
DWD	Diablo Water District
DWR	California Department of Water Resources
ECCC	East Contra Costa County
ECCCHC	East Contra Costa County Habitat Conservancy
ECCID	East Contra Costa Irrigation District
ECWMA	East County Water Management Association
EJ	environmental justice
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEIRWM Plan	2005 Functionally Equivalent IRWM Plan
FOG	Fats, Oils and Grease
FOMCW	Friends of Marsh Creek Watershed
FWSS	Future Water Supply Study
GBR	Governing Board Representatives
GHG	greenhouse gas
GMP	Groundwater Management Plan
GSWC	Golden State Water Company
Handbook	Climate Change Handbook for Regional Water Planning
HCP	East Contra Costa County Habitat Conservation Plan

HCPA	ECCC Habitat Conservation Plan Association
I	Interstate
IPCC	Intergovernmental Panel on Climate Change
IRWM	integrated regional water management
ISD	Ironhouse Sanitary District
JMC	Joint Managers Committee
KCSD	Knightsen Town Community Services District
LMEC	Los Medanos Energy Center
MGD	million gallons per day
MHI	median household income
NCCP	Natural Community Conservation Plan
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
PRC	California Public Resources Code
RAP	Regional Acceptance Process
RBWTP	Randall Bold Water Treatment Plant
RCS	Regional Capacity Study
RD	Reclamation District
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
region	East Contra Costa County region
Region	Regional Water Management Group and its members
RMS	Resource Management Strategy
RWF	Recycled Water Facility
RWMG	Regional Water Management Group
RWQCB	Regional Water Quality Control Board
San Francisco Bay Water Board	San Francisco Bay Regional Water Quality Control Board
SAR	sodium adsorption ratio
SB	Senate Bill
SR	State Route
State Water Board	State Water Resources Control Board
SWP	State Water Project
TAF	thousand acre-feet

TDS	total dissolved solids
TOC	total organic carbon
ULL	Urban Limit Line
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
UWMP	Urban Water Management Plan
Water Board	Regional Water Quality Control Board (formerly the RWQCB)
WRWC	Western Recycled Water Coalition
WTP	Water Treatment Plant
WWTF	Wastewater Treatment Facility
WWTP	Wastewater Treatment Plant

Chapter 1. Introduction

The East Contra Costa County (ECCC) Integrated Regional Water Management (IRWM) planning effort is a formal collaborative process convened to support all aspects of regional water management. This includes integrated planning for water supply, water quality, watershed and habitat protection, and flood and stormwater management. The ECCC IRWM members have a long history, extending almost 2 decades, of cooperation across political and jurisdictional boundaries. In this IRWM Plan Update, the ECCC region creates a framework to implement integrated water management projects with multiple benefits to serve the population of the region and protect water and environmental resources for the State.

This IRWM Plan Update articulates the challenges the ECCC region faces and defines the objectives it hopes to accomplish. The framework defined in the IRWM Plan is a living process the region can rely on to meet its current and future water management challenges.

1.1. Purpose

The purpose of the IRWM Plan is to provide a roadmap for the region to meets its overall water management objectives, including:

- Achieving water quality goals, meeting related regulations, and ensuring reliable water supply
- Restoring and enhancing the Sacramento-San Joaquin Delta (Delta) ecosystem and other environmental resources
- Positioning water-related planning and implementation projects for funding
- Implementing robust stormwater and flood management strategies and practices
- Engaging citizens in developing strategies and establishing broad support for integrated water management

This IRWM Plan Update addresses specific requirements, created and documented in accordance with the California Department of Water Resources (DWR) IRWM Grant Guidelines.[1] A summary of the requirements is listed in Section 1.4 and the full list is contained in **Appendix A**.

1.1.1. Background

California faces multiple challenges related to water management, including water supply reliability, threats to water quality, increasing flood risk, declining ecosystems, aging infrastructure, climate change, and economic challenges. To meet these challenges, DWR has established (1) State policy encouraging IRWM, and (2) financial planning programs for local and regional water resources managers and their stakeholders to implement IRWM.

[1] http://www.water.ca.gov/irwm/grants/docs/Guidelines/GL_2012_FINAL.pdf

In contrast with traditional water management, sector-based approaches, IRWM deals with all water functions on equal terms within the framework of an integrated water system. This plan's approach considers:

- Scientific and technical aspects of managing water supply, treatment, and wastewater systems
- Watershed resource protection
- Sustainable use and planning for the future
- Socioeconomic, institutional, policy, and political aspects of water decisions
- Governance
- Legal and institutional framework
- Regional economic conditions
- Public awareness and input
- Cultural and social customs
- Educational characteristics
- Fundamental aspects of how humans behave and interact with their water resources

The ECCC region capitalizes on the long history of integrated water planning and, with this IRWM Plan Update, defines key water management issues and objectives for ongoing water security in the region. This IRWM Plan Update also established the process by which the region will identify and integrate innovative projects and programs that, when implemented, will help the region to meet those objectives.

1.2. IRWM Process

DWR outlines specific standards, steps, and requirements for IRWM plans created with grant funds. In 2009, DWR instituted a Regional Acceptance Process (RAP) to evaluate and accept an IRWM region into its IRWM grant program. At a minimum, a region is defined as a contiguous geographic area encompassing the service areas of multiple local agencies. It is defined to maximize the opportunities to integrate water management activities, and effectively integrate water management programs and projects within a hydrologic region defined in the California Water Plan (CWP), the Regional Water Quality Control Board (Water Board, formerly the RWQCB) region, or subdivision. The ECCC region was formally accepted into the RAP process in 2009.

DWR also encourages regions to pay attention to three concepts when incorporating planning grant standards into their IRWM plans. These concepts are:

1. **Ahwahnee Water Principles** – IRWM planning is not focused on a single use of a resource, but seeks to manage that resource based on all the ways that the resource can be used. As exhibited by the IRWM Plan Standards, many aspects of IRWM planning reflect the Ahwahnee Water Principles.[2] Commonalities between IRWM planning and the Ahwahnee Water Principles include multi-agency collaboration, stakeholder involvement and collaboration, regional approaches to water management, water management involvement in land-use decisions, and project monitoring to evaluate results of current practices. Although IRWM Plan Standards can be seen as very separate and distinct items, regions should be aware of the broader overarching shift to resource planning as presented in the Ahwahnee Water Principles and the practice of IRWM planning, as opposed to a single planning purpose (i.e., water supply, wastewater, or watershed function).

2. **Flood Management** – Flood management should be integrated into IRWM plans as with other types of water management. Integrating flood management into a regional plan, as appropriate, may increase the ways a region can achieve its IRWM Plan objectives.

3. **IRWM Plan Outline** – The IRWM Plan Standards are intended to ensure IRWM plans include specific content. Although the IRWM Plan Standards name specific topics, explanations, and descriptions, these do not necessarily constitute an outline of an IRWM Plan. An IRWM Plan can be written in a format that is logical for the IRWM region. The IRWM Plan can use different titles to sections than those offered in these standards. What is important is that IRWM plans contain the proper contents that ensure effective, implementable planning.

The ECCC planning and project list development process was conducted to facilitate inclusion of IRWM Plan Standards. To do this the IRWM members created a Web site to collect and disseminate information. They met with stakeholders and developed a process to identify, evaluate, and prioritize implementation projects.

The result is an initial list of IRWM Plan project priorities. With an interactive, Web-based project list and the planning framework established, projects may be added, removed, or updated at any time. The IRWM Plan is a living document that can adapt to the challenges of water management in the region. The new Web site allows project proponents and stakeholders to view each other's projects and enable them to collaborate and integrate their projects. From time to time, the region may also initiate another formal "Call-for-Projects" to refresh their list or to prepare for a new funding opportunity. For instance, the ECCC IRWM region will complete additional planning efforts under a recently awarded Proposition 84 DWR Round 2 Planning Grant. Results of this work may warrant the addition of projects to the list. Integrated planning will continue to be ongoing, open, transparent, and collaborative.

[2] http://www.lgc.org/ahwahnee/h2o_principles.html

1.3. Document Organization

The IRWM Plan is organized to address the Guidance for IRWM Plan Standards (Appendix C of the Proposition 84 and Proposition 1E IRWM Guidelines issued by DWR in August 2010). The main chapters of this IRWM Plan are as follows:

- **Chapter 1, Introduction** – This chapter describes the purpose of the IRWM Plan to document the region's integrated water management planning process.

- **Chapter 2, Region Description** – This chapter summarizes the region's history, governance, and member agencies involved in the development of this document. It also provides a detailed description of the region's water resources.

- **Chapter 3, Plan Development** – This chapter presents the results of each step of the planning process, including the objectives, resource management strategies, technical analyses, stakeholder involvement, project review process, and integration and coordination. The chapter also details the planning process, including the living process that will continue after completion of the IRWM Plan Update, and relationships to local water and land-use planning, and stakeholders.

- **Chapter 4, IRWM Plan Implementation** – This chapter discusses all the considerations for implementing this IRWM Plan, including possible benefits and impacts.

- **Chapter 5, References** – This chapter lists the references used in the development of this document.

1.4. IRWM Plan Standards

This IRWM Plan successfully achieves the requirements of a DWR IRWM planning grant. Each of the IRWM Plan Standards, including related components, has been addressed. **Table 1-1** lists the various standards of a compliant IRWM Plan and indicates the chapter/section in which each component is addressed.

Table 1-1. Location of IRWM Plan Standard

IRWM Plan Standard	Section
Governance	Section 2.3
Region Description	Chapter 2
Objectives	Section 3.2
Resource Management Strategies	Section 3.3
Project Review Process	Section 3.4
Impacts and Benefits	Section 4.3 and Section 4.4
Plan Performance and Monitoring	Section 4.6
Data Management	Section 4.7
Finance	Section 4.5
Technical Analysis	Section 3.5
Relation to Local Water Planning	Section 3.7.9
Relation to Local Land-Use Planning	Section 3.7.10
Stakeholder Involvement	Section 3.6
Integration and Coordination	Section 3.7
Climate Change Mitigation and Adaptation Strategies	Section 2.8.9

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Chapter 2. Region Description

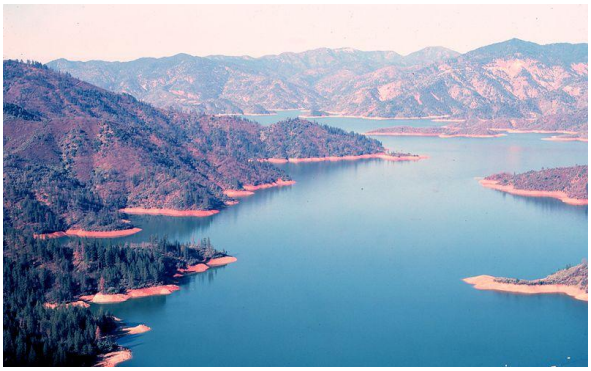
2.1. The East Contra Costa County Region

ECCC contains the largest plain area in Contra Costa County, and includes much of the hilly terrain of the Diablo Range as well as the agricultural areas adjacent and within the Delta region. Home to more than 330,000 people and still growing, its four cities are Antioch, Brentwood, Oakley, and Pittsburg. Unincorporated communities include Bay Point, Bethel Island, Byron, Discovery Bay, and Knightsen.

ECCC is bounded by the ridge lines of Mount Diablo to the south and west, and nestled along the meandering banks of the complex historic Delta water system to the north and east. The landscape frames a geographically distinct region. Its unique footprint both isolates and incorporates complex urban and Delta water management issues and brings with it a unique set of challenges and opportunities.

In addition to its and highly diverse population, the 350 square miles of ECCC host a wide range of uses, including major industrial activities, agriculture, and recreation, as well as fragile habitats and sensitive species. All are dependent on water.

The Delta serves as the primary water source. Originating from rivers within the Sierra Nevada, the water flows into the Sacramento and San Joaquin rivers, eventually finding its way into the Delta. The ECCC members all share a location within and/or a hydrological connection to the statutory Delta–a legally defined, environmentally sensitive ecosystem that supports over 750 plant and animal species, provides drinking water to over two-thirds of Californians, and irrigation supplies for more than 7 million acres of the most productive agricultural land in the world.



Water flowing from the headwaters of the Sacramento River then stored at Lake Shasta are part of an overall water system that serves ECCC.

This water is supplemented to varying degrees by groundwater and recycled water. Residents also benefit from and rely on critical flood and stormwater infrastructure, water treatment facilities, wastewater collection systems and treatment plants, and recycled water systems.

The integrated water management needs of the region are likely to grow. Although slowed by the recent housing foreclosure crisis and downturns in the economy, the ECCC region projects rapid increases in population over the long term as the demand for affordable housing continues to push Bay Area residents toward the eastern edges of Contra Costa and Alameda counties.

2.2. History of Regional Planning

The ECCC signatories recognize the value of coordinated regional planning and have a long history, extending almost 2 decades, of cooperation across geographies, political boundaries, and

project types. An early example of this cooperation occurred with the completion of the East County Water Supply Management Study in 1996 (1996 Study).

The 1996 Study was commissioned by the East County Water Management Association (ECWMA). The Governing Board of Representatives included:

- City of Antioch
- City of Brentwood
- Byron-Bethany Irrigation District (BBID)
- Contra Costa County Water Agency (CCCWA)
- Delta Diablo Sanitation District (DDSD)
- Diablo Water District (DWD)
- East Contra Costa Irrigation District (ECCID)
- Ironhouse Sanitary District (ISD)
- City of Pittsburg

The purpose of the effort was to assess future water supply management within the eastern portion of Contra Costa County. Through this effort, the partnering agencies developed a comprehensive regional assessment of water demands and supplies through 2040, treatment and delivery options, water supply alternatives, and recommendations and implementation strategies for regional water management.

This cooperative approach has served the region well and as the ECWMA stepped forward to lead the ECCC IRWM Region. Other collaborative activities of the group members prior to the formation of the IRWM Region included multi-agency coordination for completion of multiple planning efforts, such as:

- *Contra Costa Water District* (CCWD) *Future Water Supply Study* (FWSS) *Final Report*, 1996 – A detailed analysis of the future supply and water needs for the CCWD service area, informed by a 29-member stakeholder feedback group, including ECCC.

- *Contra Costa County Stormwater Management Plan*, 1999 – The basis for the Contra Costa Clean Water Program's National Pollutant Discharge Elimination System (NPDES) Permit application to the Central Valley Water Board and San Francisco Bay Water Board.

- *CCWD FWSS Final Report Update*, 2002 – A review of projections and success of the 1996 FWSS, including updated 50-year water demand projections and a review of available supplies based on 2000 Census data and CCWD obligations contained in the Biological Opinion for the Multi-Purpose Pipeline and the FWSS Implementation Program. It also reflected renegotiation of CCWD's Central Valley Project (CVP) contract, an expanded conservation program, and water transfers to provide drought reliability and to accommodate future growth.

- *Delta Regional Drinking Water Quality Management Plan*, 2005 – Provided an understanding of water quality conditions at the urban intakes within the Delta; identified challenges and issues confronting agencies diverting water from the Delta; and developed projects and programs at the local, regional, and statewide level to address these issues and ensure that in-Delta agencies can meet their water quality goals in the future.

- *Functionally Equivalent IRWM Plan* (FEIRWM Plan), 2005 – Leveraged the planning efforts cited above and brought together water management agencies of the ECWMA, identified water management objectives and strategies, and helped prioritize a list of implementation projects.

- *East Contra Costa County Habitat Conservation Plan* (HCP) *and Natural Community Conservation Plan* (NCCP), 2006 – Provided a plan to preserve and enhance native habitats that support endangered and sensitive species while providing a regional incidental take permit under the federal Endangered Species Act (ESA) and California Endangered Species Act (CESA). The HCP was finalized in 2007 and implementation started in 2008.

- *Brentwood/CCWD Joint Water Treatment Plant* (WTP), 2008 – The City of Brentwood and CCWD partnered to design, finance, build, and operate a WTP to serve Brentwood. The new plant shares facilities and infrastructure with its neighbor, CCWD's RB WTP (RBWTP). These measures reduce operational and construction costs and environmental impacts, while providing an efficient and reliable water treatment system.

Other notable joint efforts included:

- East County Groundwater Study (1999)
- ECCID-Brentwood Transfers (1999)
- ECCID-CCWD Transfer (2000)
- DWD-Antioch Intertie (2003)
- DWD Tracy Subbasin Groundwater Management Plan (GMP) (2007)
- DDSD/Pittsburg Recycled Water Project (2008)
- Pittsburg Plain GMP (2012)
- Pittsburg Plain Salt and Nutrient Management Program Summary Report (2012)
- DWD Tracy Subbasin Data Gap Analysis Report (2012)

The Randall-Bold Water Treatment Plant is one example of a shared facility within the East Contra Costa County Region

ECCC agencies also share and/or use interdependent facilities such as interties between member agencies and the RB WTP, which is co-owned by CCWD and DWD. Some capacity at the Randall Bold plant is allocated to the cities of Antioch and the community of Bay Point. Since CCWD is the primary surface water supply wholesaler to the ECCC region, many agencies are

dependent upon CCWD's Delta infrastructure, including the Delta intakes at Rock Slough and Old River, the Contra Costa Canal (Canal) and Los Vaqueros Reservoir, and related conveyance. The same is true on the wastewater side where DDSD's regional WWTP and conveyance system serves the collection system of Antioch and Pittsburg.

While the ECWMA was founded in 1995 to undertake the development of the 1996 Study, it was terminated upon acceptance of the recommended actions in the study (November 1996). Realizing how important coordination was, the regional partners reestablished ECWMA in August 1997 to facilitate continued communication, cooperation, and education among the member agencies as water supply reliability projects were implemented.

Part of what makes the ECWMA such a successful regional water management group is that member agencies all share common water management challenges and a desire to pool resources to leverage results.

The spirit of partnership continues to this day and member agencies coordinate on a regular basis. As described later in this section, the level of regional cooperation and coordination facilitated by the ECWMA has helped to avoid/resolve potential conflicts in the region and has resulted in several successful regional planning and implementation projects within the ECCC region over the past decade. The success of these multi-benefit regional initiatives has established a foundation of trust between ECWMA member agencies and other regional stakeholders that will enable successful implementation of future water management activities as well.

2.2.1. The DWR IRWM Regional Process

In 2009, the DWR instituted an RAP to evaluate and accept an IRWM region into its IRWM grant program. At a minimum, a region is defined as a contiguous geographic area encompassing the service areas of multiple local agencies; is defined to maximize the opportunities to integrate water management activities; and effectively integrates water management programs and projects within a hydrologic region defined in the CWP, the Water Board region or subdivision, or other region specifically identified by DWR.

Per these new requirements, the ECCC region successfully submitted an RAP application and was fully recognized by DWR as an IRWM region. Interestingly, the IRWM regional definition creates some complexity. As a contiguous geographic area encompassing multiple ECCC service areas, the region also overlaps sections of the San Francisco Bay Area IRWM region. This Bay Area region includes all or part of nine counties (including Contra Costa) and 110 cities, and is coterminous with the boundary of the San Francisco Bay Water Board (Region 2).

While the ECCC region rests primarily in the jurisdiction of the Central Valley Water Board (Region 5), it overlaps with Region 2 (the San Francisco Bay Water Board) jurisdiction in Pittsburg, Bay Point, and a small portion of Antioch within Contra Costa County. Further, under the definitions of funding areas as described in DWR grant guidelines, the overlap area is eligible for funds from both the San Francisco and San Joaquin funding areas. The potential for leveraging multiple funding sources with the San Francisco Bay IRWM region is especially important as the overlap area includes, as defined by income, a disproportionate number of

Disadvantaged Advantaged Community (DAC) members. At the same time, the requirements for coordination are increased.

As part of its RAP application, the ECWMA member agencies formed a Regional Water Management Group (RWMG), responsible for navigating these jurisdictional complexities, coordinating with other planning efforts, and updating and implementing the region's IRWM Plan. Added to the original list of 1996 partners and in recognition of the importance of integrated management, was:

- Contra Costa County Flood Control and Water Conservation District (CCCFCWCD)
- Discovery Bay Community Services District
- East Contra Costa County Habitat Conservancy (ECCCHC)

With the FEIRWM Plan and the 2009 RAP, the region was able to secure various planning and implementation grants from DWR to implement and update their IRWM Plan. **Table 2-1** shows each of the successful grants for the region.

In 2010 the ECWMA was amended to change the name "Contra Costa County Water Agency" to "Contra Costa County.

Table 2-1. IRWM Regional Grant Awards

Funding Opportunity	Date	Amount Received	Projects
Proposition 50 IRWM Implementation Grant, Round	2005—2006	$12,500,000	• Antioch Recycled Water Implementation • DWD Well Utilization Project • Pittsburg Recycled Water Project • Alternative Intake Project • Antioch Water Treatment Plant Project • CCWD Canal Improvement Project • Dutch Slough Tidal Marsh Restoration – Phase 1 • HCP Habitat and Watershed Protection/Restoration Project
Proposition 1E Stormwater Flood Management Grant, Round 1	December 2011	$2,000,000	Awarded to CCFCWFCD • Upper Sand Creek Basin Improvements
Proposition 1E Stormwater Flood Management Grant, Round 1	December 2011	$10,000,000	Awarded to CCWD • Contra Costa Canal Improvements
Proposition 1E Stormwater Flood Management Grant, Round 1	December 2011	$2,997,300	Awarded to the City of Antioch • West Antioch Creek Stormwater Improvements
Proposition 84 Implementation Grant, Round 1	August 2011	$1,775,000	• Pittsburg Recycled Water Pipeline Rehabilitation Project • Watershed Protection and Restoration
Proposition 84 Planning Grant, Round 1	February 2011	$449,843	• IRWM Plan Update • Pittsburg Plain GMP • Tracy Subbasin Data Gap Analysis Report • Pittsburg Plain Salt and Nutrient Management Program Summary Report
Proposition 84 Planning Grant, Round 2	November 2012	$451,818	• Enhanced Web Site and Outreach • Regional Recycled Water Planning • Regional Capacity Study

Key:
CCFCWCD = Contra Costa Flood Control and Water Conservation District
CCWD = Contra Costa Water District
DWD = Diablo Water District
GMP = Groundwater Management Plan
HCP = East Contra Costa County Habitat Conservation Plan
IRWM = Integrated Regional Water Management

2.3. Governance

As noted above, the ECWMA is the foundation of the IRWM and serves as the official RWMG for the ECCC region. It remains a consortium of 12 member agencies with a broad range of water management-related responsibilities within the region. The organizational structure is shown in **Figure 2-1.**

2.3.1. Governing Board Representatives

The ECWMA is governed and operated by the Governing Board Representatives (GBR), composed of one elected official representative from each of the member agencies. Member agency governing boards and councils appoint their representatives and set the parameters for their participation. The GBR is responsible for providing policy guidance for ECWMA activities. Each member agency has one vote on the GBR, and all actions of the ECWMA require a majority vote. The GBR appoints one of its members as chair and one as vice-chair. The term of office for these appointments is 2 years. The GBR meets at least twice a year, and all of the meetings are open to the public, noticed, and conducted in accordance with the Brown Act, Government Code Section 54950 et seq. In addition, the chair or any three members of the GBR may call a special meeting. A full roster of the Governing Board is contained in **Appendix B**.

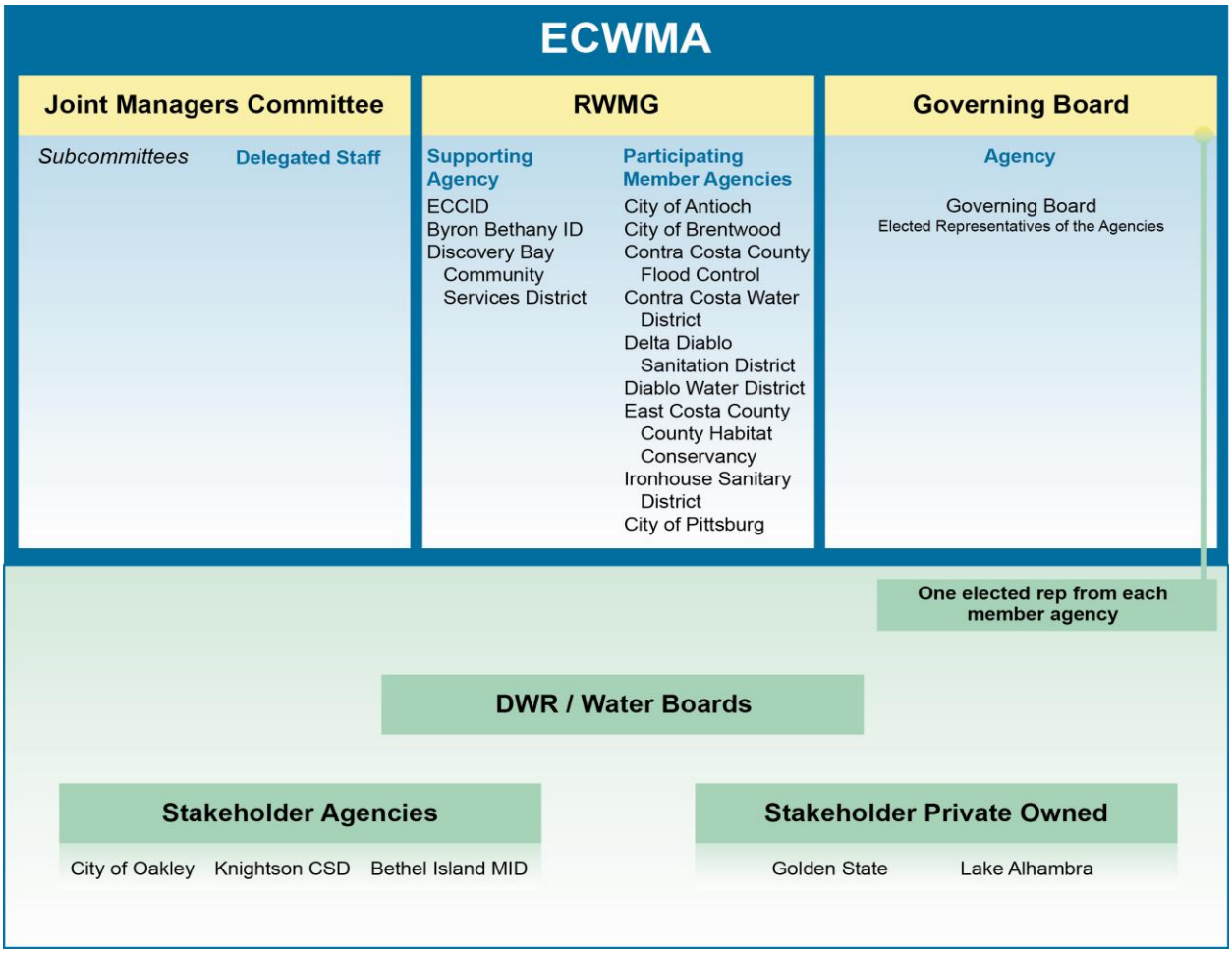


Figure 2-1. ECWMA Organization Chart

Joint Managers Committee

The Joint Managers Committee (JMC) is composed of the managers from each of the member agencies. The JMC is the primary administrative body for implementing ECMWA activities. The JMC may act directly or through a subcommittee established by a majority of its members. Each member has one vote on the committee. Meetings are held, as needed, at the discretion of the JMC. The JMC appoints one of its members as chair and one as vice-chair, each of which has a 2-year office term.

Subcommittees

The JMC often forms subcommittees related to specific water management activities that members of the ECWMA are involved in. For example, there was a subcommittee of the member agencies and stakeholders that took the lead in developing the FEIRWM Plan, related grants applications, and the IRWM Plan Update.

2.3.2. Scope

Decision Making

The ECWMA is a collaborative association with member agencies each having one vote on the GBR and one vote on the JMC. All actions undertaken by the ECWMA require majority vote. If one or more members do not wish to participate in an activity undertaken by the ECWMA, the member can opt out and would not have any financial responsibility for that activity.

Implementation of the IRWM Plan

Implementation of the IRWM Plan is conducted by the project sponsors, which typically consist of partnerships of member agencies and interested stakeholders. The project sponsors undertake specific activities related to project implementation and funding. However, progress reports on the status of the project implementation are provided at the GBR/JMC meetings and other regional forums.

Updating the IRWM Plan

The decision-making process for updating the IRWM Plan involves the following steps:

The JMC (or designated subcommittee) develops a scope of work for the IRWM Plan Update, taking into consideration any stakeholder input that may have been provided at any of the stakeholder forums.

1. The JMC solicits support from a consulting firm to help undertake development of the update.

2. The JMC presents the scope and recommended consultant selection at a GBR meeting. As discussed previously, the GBR meets at least twice a year and additionally, as needed. All of the GBR meetings are open to the public, noticed, and conducted in accordance with the Brown Act.

3. The GBR considers the JMC's recommendations along with any additional input from stakeholders at the meeting and votes on whether to accept the recommendations. Each GBR representative is given one vote and the majority vote rules. Once a recommendation is accepted, the GBR approves the scope and consultant selection.

4. An agreement among the member agencies to update the IRWM Plan is developed and executed. This agreement identified (1) which agency will enter into contract with the selected consultant, and (2) funding responsibilities and/or in-kind service requirements of the participating agencies.

5. The JMC (or subcommittee) will manage the consultant and review interim work products. The GBR will review final drafts and accept the final work product.

Progress Monitoring

There are two levels of monitoring, (1) project level, undertaken by the project sponsor; and (2) IRWM Plan level, undertaken by all the plan participants under the auspices of the ECWMA. Each of the projects included within the plan will have specific project metrics and appropriate monitoring approaches identified to assess performance on an ongoing basis. The project proponent takes the lead on monitoring the project implementation performance, and is responsible for providing updates to the ECWMA.

The ECWMA uses the project monitoring information, together with input from member agencies and stakeholders to assist with periodic reviews of the progress of the region in meeting the objectives of the IRWM Plan. Review of progress and reevaluation of conditions and needs in the region feeds into the IRWM Plan updates discussed above.

Grant Applications

In the case of applying for a grant, the JMC, with stakeholder input, recommends to the GBR that the region pursue grant funds for one or more high-priority projects that meet specific grant criteria. Upon GBR approval, the agencies sponsoring projects to be included in the grant application fund development of the grant proposal.

2.4. Description of Internal Boundaries

2.4.1. Region

The region as approved by DWR during the 2009 RAP covers 350 square miles. The ECCC IRWM region has distinct water management circumstances that unify it as a region. The region boundary is shown in **Figure 2-2**.

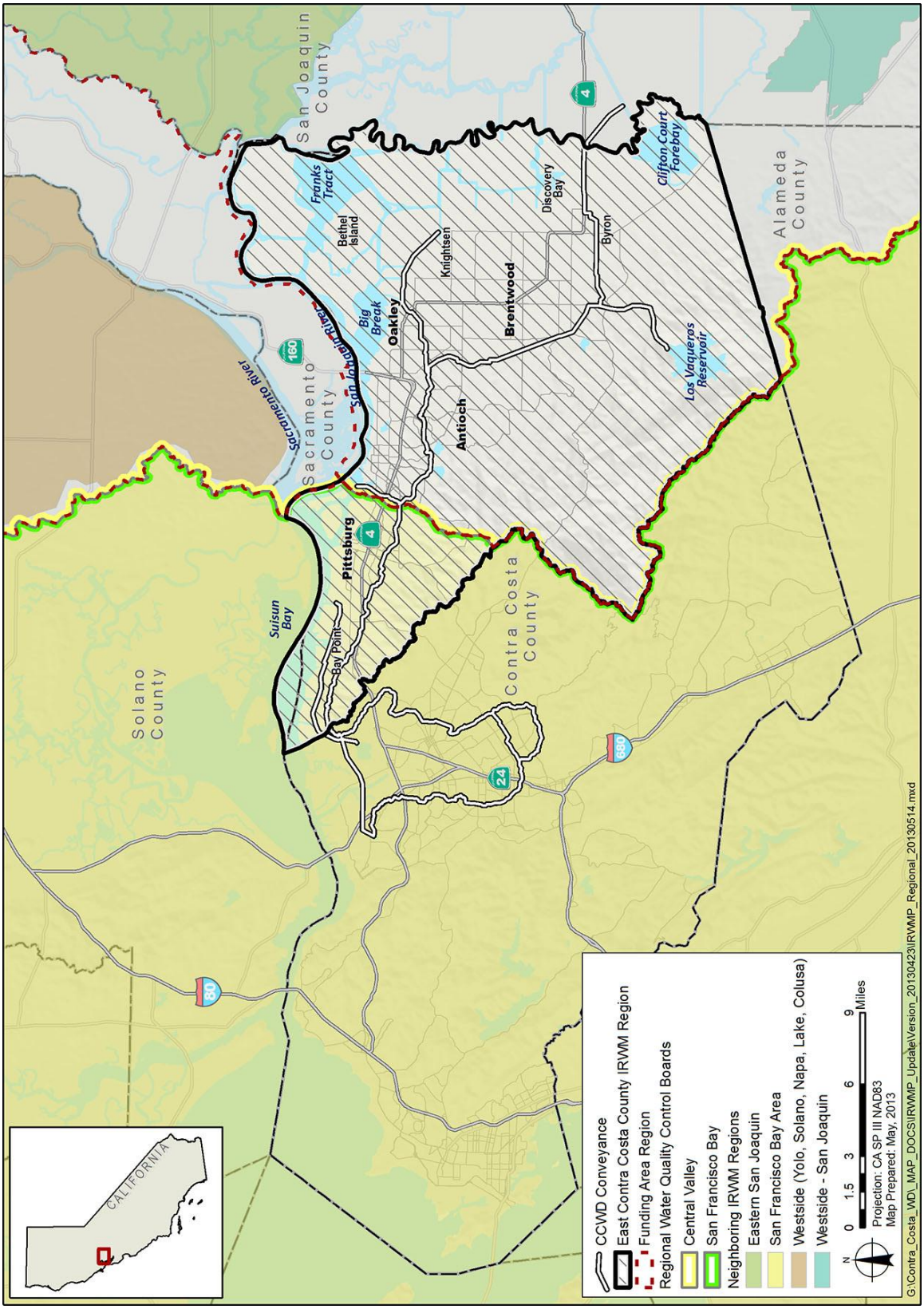


Figure 2-2. ECCC IRWM Region and Surrounding Areas

Region Quick Facts

The ECCC IRWM region is a cohesive geographic area. Isolated from the remainder of Contra Costa County and the greater Bay Area by ridgelines of Mount Diablo, on the southern and western boundaries, it is bounded on the north and east by the San Joaquin River and Old River, and the associated maze of waterways within an agricultural zone effectively separating the ECCC region from the Central Valley region.

The entire region drains to the Delta. This occurs primarily through the Marsh Creek, Kirker Creek, and Kellogg Creek watersheds. These watersheds encompass the jurisdictional boundaries of the ECCC IRWM region participating agencies, except for Contra Costa County and the CCWD, which serve an area broader than ECCC.

All or a portion of the cities and unincorporated communities within the ECCC IRWM region are located within the statutory Delta. Located within the Delta boundaries, and with Delta water as a primary source of drinking water for the ECCC IRWM region, the agencies in ECCC share a common commitment to protect and restore the Delta water quality and environment. **Figure 2-3** shows the region in relation to the statutory boundaries of the Delta.

The water agencies in the ECCC IRWM region all fall within the jurisdiction of the Central Valley Water Board (Region 5). There are some agencies (CCWD, DDSD, and the City of Pittsburg) that fall in both the San Francisco Bay Water Board (Region 2) and the Central Valley Water Board (Region 5). The remaining regional entities lie entirely within the Central Valley Water Board. These water board boundaries are shown in **Figure 2-2**.

The water management entities in ECCC have long recognized the value of regional cooperation in integrating water management activities related to natural and constructed water systems. Ongoing regional planning initiatives, such as the HCP, the IRWM Plan and others, are in place for the ECCC communities, urban water suppliers, agricultural water suppliers, habitat preservation and enhancement entities, watershed managers, and wastewater agencies to work on common issues. Successful resolution to past water resource conflicts has given these entities proven practices and tools to manage potential conflicts in the future.

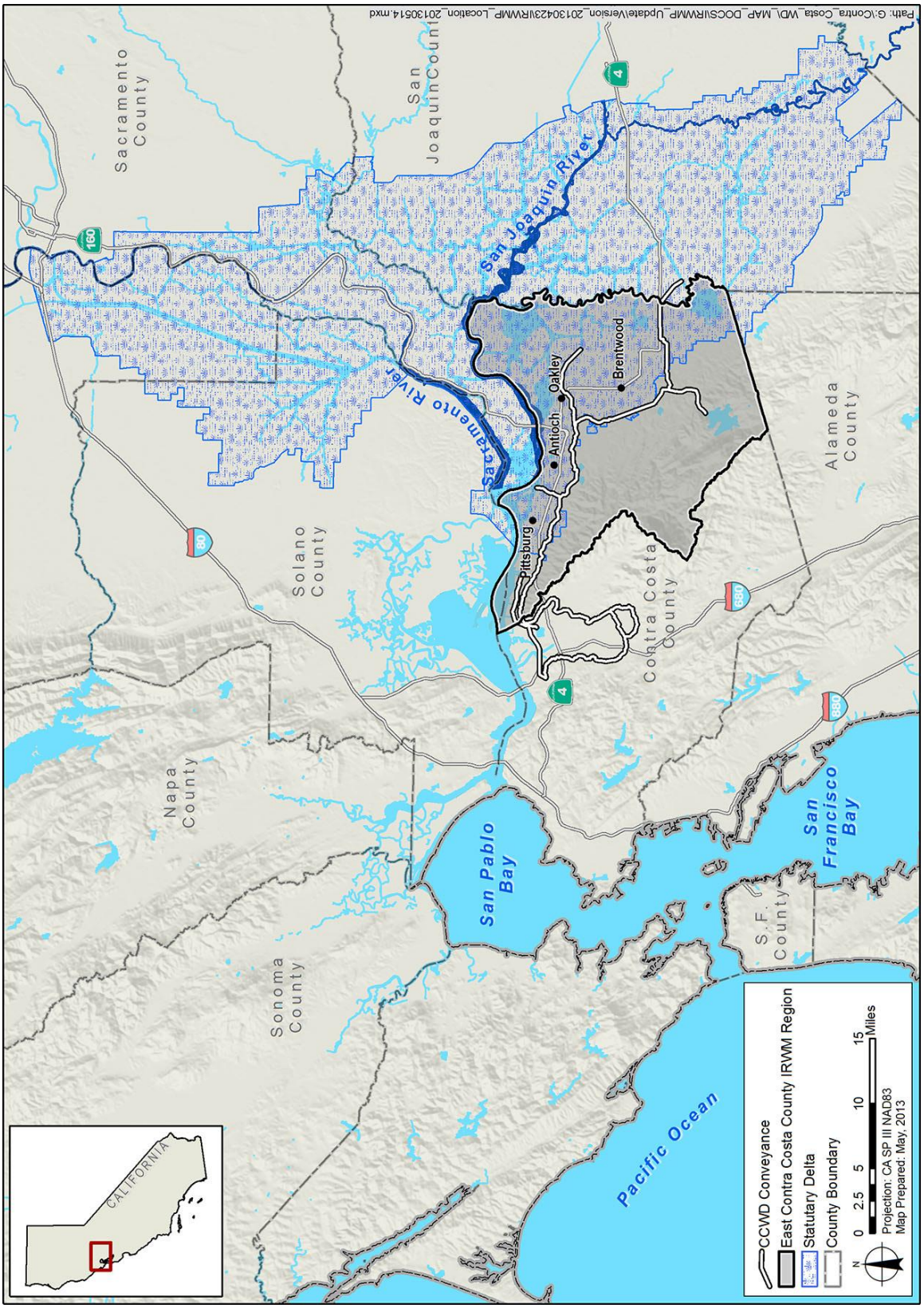


Figure 2-3. ECCC IRWM Region and the Statutory Delta

2.4.2. Member Agencies

This IRWM Plan Update was developed under the direction and support of the RWMG and its members, as identified in the region's RAP application. The ECCC region covers all aspects of water management within the region: drinking water supply and quality, wastewater, recycled water, flood control and stormwater, and watershed and habitat management. **Table 2-2** illustrates the range of services provided by member agencies.

Table 2-2. Regional Water Management Group Members and Primary Functions

Member Agency	Water Supply and Quality*	Wastewater*	Recycled*	Stormwater/ Flood Management	Watershed and Habitat
City of Antioch	√*	√	√	√	√
City of Brentwood	√*	√*	√*	√	√
Byron-Bethany Irrigation District	√	√*			
Contra Costa County Flood Control				√	√
Contra Costa Water District	√*			√	√
Delta Diablo Sanitation District		√*	√*		
Diablo Water District	√*				
Discovery Bay Community Services District	√*	√*		√	
East Contra Costa County Habitat Conservancy	√				√
East Contra Costa Irrigation District	√				
Ironhouse Sanitary District		√*	√*		
City of Pittsburg	√*	√	√	√	√

Note:
* Agency role includes treatment; otherwise role is collection/distribution

The RWMG and its members are diverse, ranging from municipalities to special districts, with large agencies employing hundreds of staff members to very small agencies with fewer than five staff members. Many of the agencies work within the same geographies, and over the years the jurisdictions forged cooperative efforts, well in advance of being formally accepted by DWR as an IRWM region.

Figures 2-4 through **2-6** illustrate the boundaries of the region's agencies by their service type. **Figure 2-4** displays participating and supporting water agencies, **Figure 2-5** displays participating wastewater agencies, and **Figure 2-6** shows the participating flood management and environmental agencies.

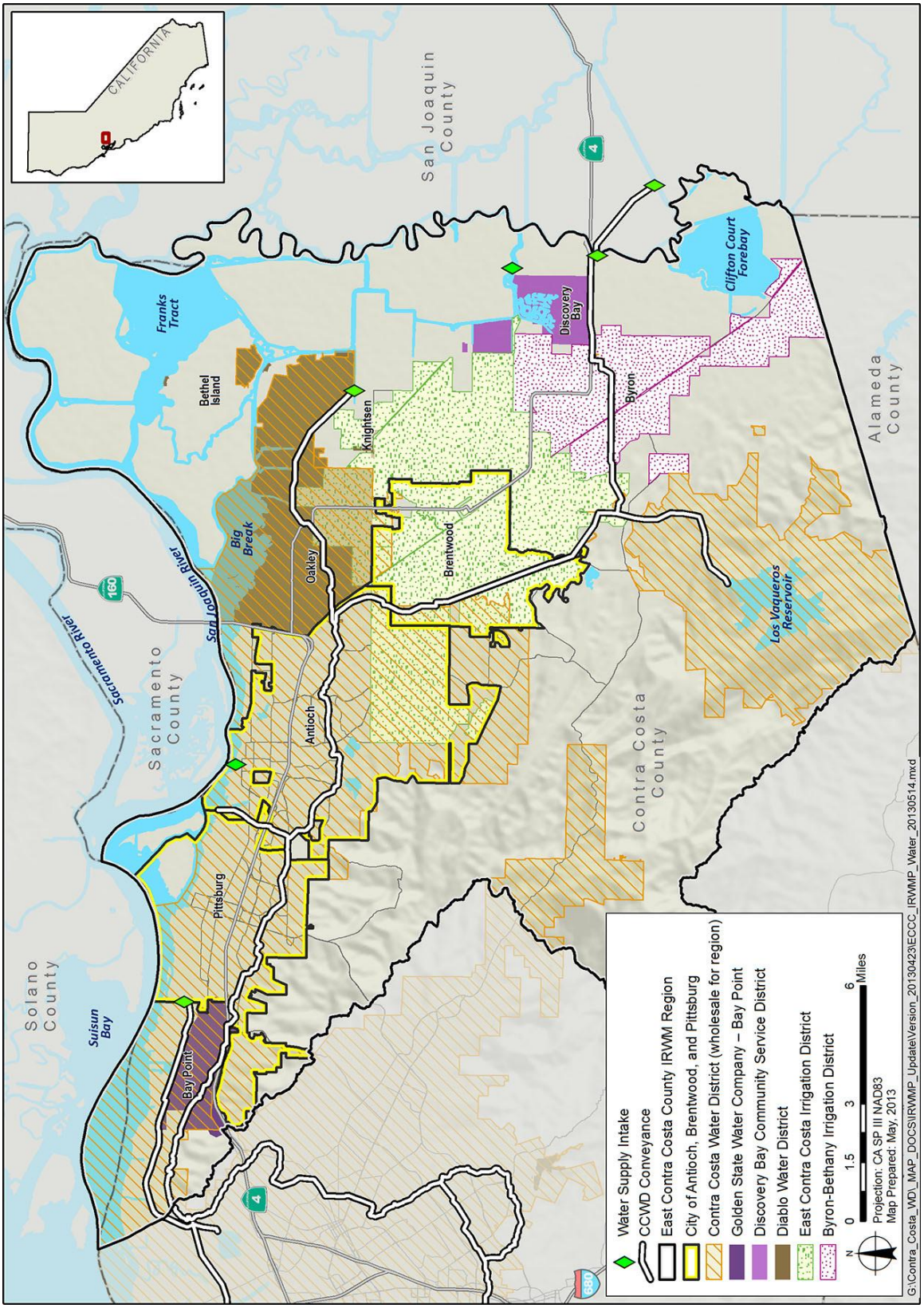


Figure 2-4. Participating Water Supply Agencies

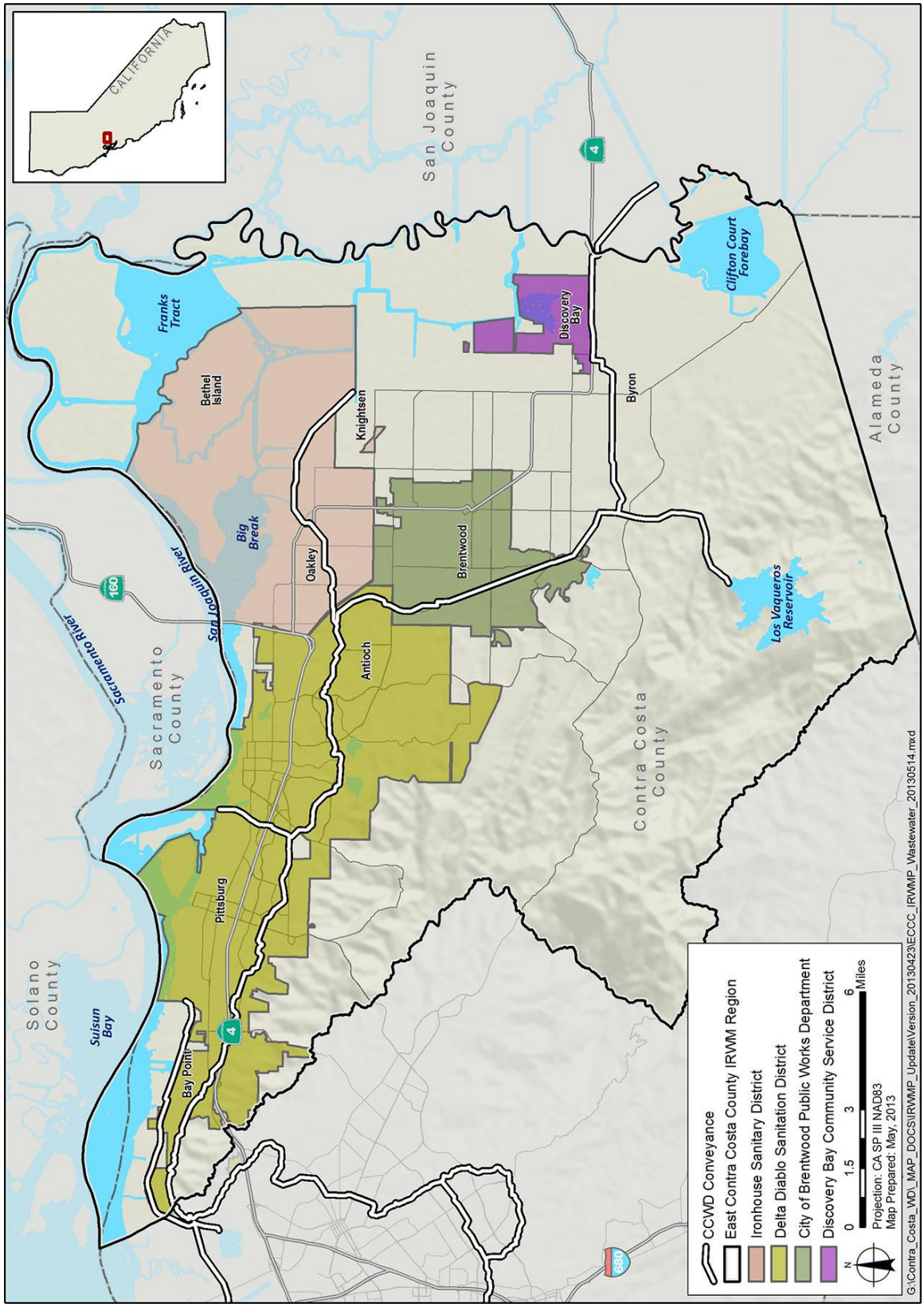


Figure 2-5. Participating Wastewater Agencies

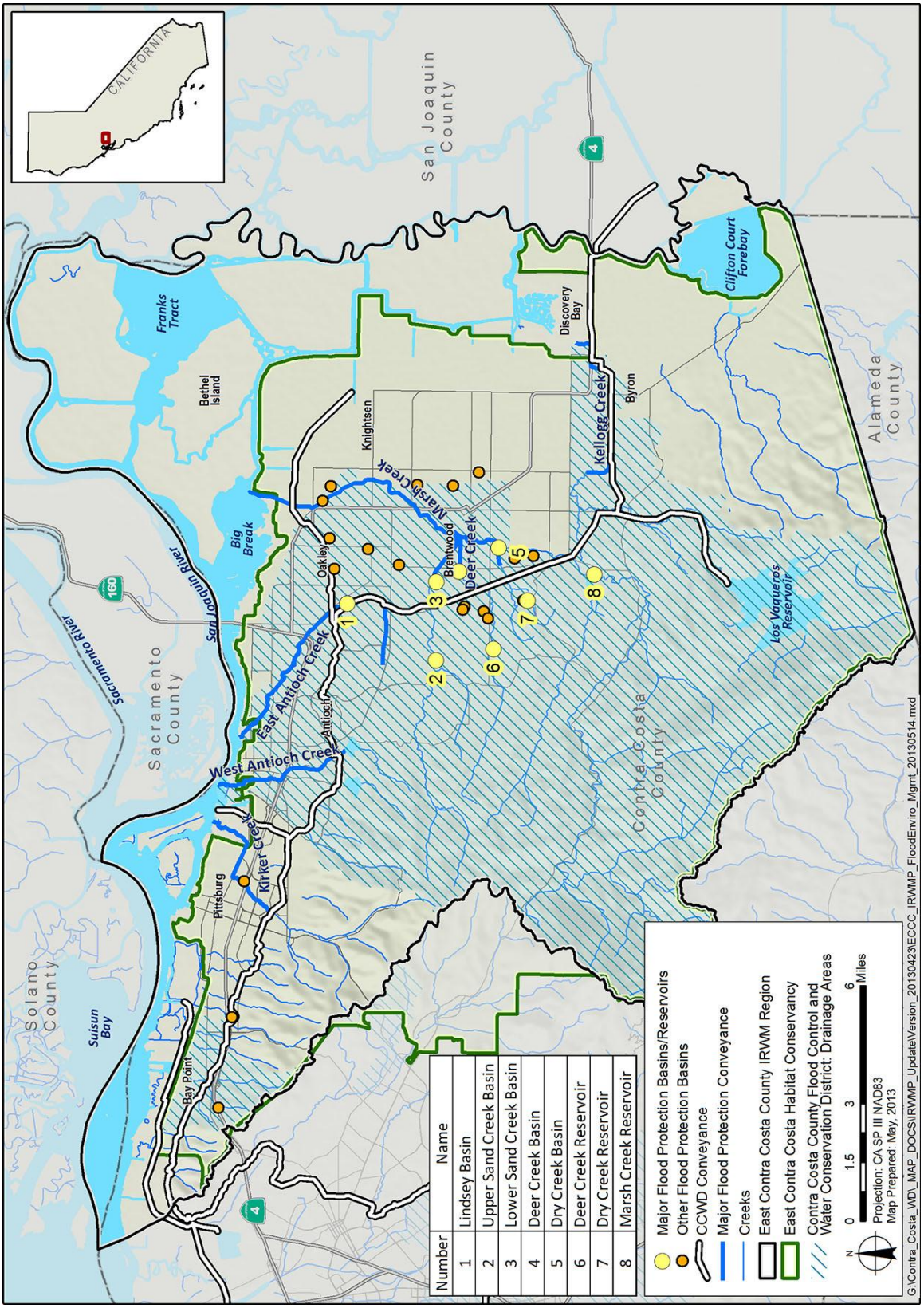


Figure 2-6. Participating Flood Management and Environmental Agencies

Following are brief descriptions of the agencies and the services each provides.

City of Antioch

Agency role:

- Water Supply and Quality
- Stormwater/Flood Management
- Watershed and Habitat
- Wastewater

The City of Antioch, one of California's oldest cities, is home to 103,833 residents. The City delivers treated water to residential, commercial, and irrigation customers. Personnel maintain approximately 387 miles of water main, 31,349 service connections and meters, and 2,329 backflow prevention devices; they maintain, repair, and flush approximately 3,449 fire hydrants, and exercise system valves. They also administer a water conservation program focused on providing residential, commercial, and irrigation customers with education, assistance, and financial incentives to conserve the City's treated water supply.

Antioch pumps water from the San Joaquin River when Delta water quality is sufficient. Antioch also purchases untreated Delta water from CCWD and has the capacity to treat 36 million gallons per day (MGD) at the Antioch WTP. In addition, Antioch has purchased a permanent capacity right (currently 5 MGD with a reservation of up to 10 MGD) in the RB WTP, a regional WTP co-owned with CCWD and DWD from CCWD's share of the Randall Bold WTP capacity.

The City also maintains an estimated 305 miles of sanitary sewer system for wastewater collection that serves 29,943 residential and commercial sewer lateral connections. Waste flows to DDSD's Regional Treatment Plant.

The City stormwater operations maintain, in a safe and serviceable condition, natural and constructed facilities that handle stormwater runoff in the City of Antioch's jurisdiction. Personnel assigned to this activity remove debris and illegally dumped trash, and perform weed abatement activities.

City of Brentwood

Agency role:

- Water Supply and Quality
- Recycled Water
- Stormwater/Flood Management
- Watershed and Habitat
- Wastewater

The City of Brentwood delivers water to more than 52,000 residents through 18,000 connections and approximately 172 miles of water mains. The City uses groundwater and surface water for its domestic water system using entitlements from ECCID. The City's eight groundwater wells supply over 1.9 billion gallons of water each year. Surface water treated at the City of Brentwood WTP and the RB WTP supply 2.5 billion gallons of water annually.

The City has multiple storage reservoirs located throughout the City to store water during low demand periods for use during peak consumption by the City's water customers.

The COBWTP was part of a joint venture between the City and CCWD in which the City owns the facility and is responsible for operational and capital costs, and CCWD operates and maintains the facility. The first phase of the COBWTP, which has been constructed and is in operation, can treat up to 16.5 MGD of surface water.

However, the plant is designed so that it can be expanded to an ultimate capacity of 33.0 MGD to serve the City's projected water demands through 2040. In addition, Brentwood has purchased a permanent capacity right of 6 MGD in the RB WTP, a regional WTP co-owned with CCWD and DWD.

In addition, the City owns and operates a 5.0 MGD tertiary wastewater treatment facility (WWTF), including reclamation facilities for irrigation. Brentwood has been collecting and treating wastewater since 1948.

In an effort to conserve water, the City of Brentwood uses recycled water to irrigate a majority of parks and golf courses, saving an estimated 3 MGD of water. Recycled water is generated at the wastewater treatment plant located on Elkins Way, above. *Photo by Samie Hartley, March 12, 2009 - Source www.press.net.*

Byron Bethany Irrigation District

Agency role:

- Water Supply and Quality
- Wastewater

The BBID operates and maintains the wastewater collection system and treatment facility for the residents of Byron and provides agricultural water to southeastern Contra Costa County. Organized in 1914, BBID originally furnished water to landowners in Contra Costa, Alameda, and San Joaquin counties, covering 24,000 acres northwest of Tracy. While BBID was owned, built, and managed by the landowners, it was not consolidated into an irrigation district until 2004. In 2004, BBID formally consolidated with the former Plain View Water District, an adjacent district of 6,000 acres located in San Joaquin County along the Delta-Mendota Canal south and west of Tracy.

BBID, supplies water to a total of just over 30,000 acres of farms, towns, and businesses. In 2012 BBID served 5,663 acres within Contra Costa County that used 18,484 acre-feet (AF) of water.

BBID also maintains its own pre-1914 water right and diverts water under a settlement agreement with DWR from an intake in the Harvey O. Banks Delta Pumping Plant (Banks) intake channel, located between DWR's Clifton Court Forebay and Banks Pumping Plant. Also as a federal CVP contractor, BBID receives water from the Trinity and Sacramento rivers that has been stored in Shasta Reservoir and sent toward the Delta as part of the CVP. Once in the Delta, the water is distributed by the Delta-Mendota Canal to the rest of the State. In the process,

it makes a stop at the C. W. "Bill" Jones Pumping Plant in nearby Tracy, which then sends it on to BBID. This CVP water is delivered by BBID to Mountain House, City of Tracy, and the Tracy Hills development. Wastewater treated at the BBID WWTF is disposed either by percolation and evaporation in the ponds or by land application. This WWTF is permitted for 96,000 gallons per day.

Contra Costa County Flood Control and Water Conservation District

Agency role:

- Stormwater/Flood Management

Created in 1951 by the CCCFCWCD Act, the CCCFCWCD is a special district that manages flood and stormwater, develops flood control plans, and establishes and collects development fees through drainage areas (DA) to fund subregional drainage improvements that support approved General Plan land uses. Plans and fee ordinances, adopted by the Board of Supervisors under the Act, are not subject to the Subdivision Map Act.

The CCCFCWCD's mission is to provide flood protection facilities while protecting environmental resources. Its jurisdiction extends throughout Contra Costa County, including incorporated areas and it owns most of the major storm drainage facilities in the County. The CCCFCWCD works directly with cities and the County to carry out its mission including as appropriate:

- Implementing DA and zone plans
- Constructing flood control projects
- Maintaining facilities
- Managing rights of way
- Reviewing and issuing Flood Control Encroachment Permits for work within CCCFCWCD right of way

The CCCFCWCD is an active partner in the Contra Costa Clean Water Program, with a comprehensive plan to reduce the discharge of pollutants to the maximum extent practicable, and is regulated under Central Valley Water Board Order. No.

Understanding Appropriative Water Rights

California appropriative water rights (the right to take water) are typically referred to as pre-1914, and post-1914.

Pre-1914 rights are based on laws enacted in 1872. Generally, people wanting to take water from a water body posted a notice and/or began to use it in a beneficial way. It was essentially a first come, first serve approach and the people first in line can pre-empt those following.

Once acquired, a pre-1914 appropriative right can only be maintained only by continuous beneficial use of the water. The right is not fixed by the amount claimed in the original notice of appropriation; the notice of appropriation only fixes the date of priority. The amount of the right is fixed by the amount that can be shown to be actually beneficially used as to both amount and season of diversion. The rights acquired under a pre-1914 water right can be lost by either abandonment or failure to use the water beneficially for 5 years.

On December 19, 1914, the California Legislature adopted new Water Code that fundamentally changed the procedures for obtaining an appropriative water right. These rights are called post-1914. Obtaining a post-1914 right begins with an Application to Appropriate Water with the State Water Resources Control Board. A series of additional steps then follow.

This distinction in water rights is important to understand as it explains what is required to maintain the right and the order of priority to water the water right holder has.

R5-2010-0102. This is a joint permit for the City of Antioch, City of Brentwood, City of Oakley, Contra Costa County, and CCCFCWCD.

The CCCFCWCD is involved with several watershed groups, watershed councils, watershed-focused agencies such as the Contra Costa Resource Conservation District (CCRCD) and the Friends of Marsh Creek Watershed (FOMCW). In the ECCC region, the CCCFCWCD has worked cooperatively on a fish passage projects, creek and habitat restoration projects, and recreational facilities (trails and dual use parks/play fields) as part of its ongoing membership in the Region's community.

Contra Costa Resource Conservation District

Agency Role:

- Water Supply and Quality
- Watershed and Habitat

The mission of the CCRCD is to facilitate conservation and stewardship of the county's natural resources. Under that mission, the CCRCD has worked in cooperation with landowners and agencies in the ECCC region for many years. The CCRCD is a nonregulatory agency – working with individuals, growers, ranchers, public agencies, nonprofit organizations and corporations to accomplish goals. Their federal partner, the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), provides technical support for programs.

The CCRCD was formed in 1941. Their service area is consistent with the political boundaries of Contra Costa County. CCRCD is one of California's 103 Resource Conservation Districts and is governed by a voluntary Board of Directors appointed by the County Board of Supervisors and regulated under Division 9 of the California Public Resources Code. The CCRCD Board of Directors holds monthly meetings.

The CCRCD has active programs in many parts of the county related to promoting watershed awareness and health and habitat. As an example the CCRCD worked with land owners and developed watershed plans. It has promoted an Adopt a Creek Program, and supports Friends of Marsh Creek and the Contra Costa Watershed Forum

Contra Costa Water District

Agency role:

- Water Supply and Quality
- Stormwater/Flood Management
- Watershed and Habitat

The CCWD, covering 137,127 acres, was formed in 1936 to provide water for irrigation and industry. Since then, CCWD has expanded to serve about 500,000 people in central and eastern Contra Costa County, making it one of California's largest urban water districts.

A leader in drinking water treatment technology and source water protection, CCWD acts as both a retail and wholesale water distributor, delivering treated drinking water directly to customers and both treated and untreated water to retail water agencies and major industries. About 200,000 people receive treated water directly from CCWD, and the other 300,000 receive water CCWD delivers to six local agencies.

CCWD draws its water from the Delta primarily under a contract with the federal CVP. As such, it is particularly concerned about Delta water quality and the Delta environment. CCWD is the CVP's largest urban contractor. Other local sources of water used in CCWD's service area include a Delta surplus water right, Mallard Slough water rights, recycled water, a minor amount of local well water, and water transfers.

In 1998, CCWD completed construction of the locally financed $450 million Los Vaqueros Project, including a 100 thousand acre-feet (TAF) reservoir, designed to provide improved water quality and emergency supply reliability for CCWD customers, as well as net environmental benefits. In 2012, the reservoir was enlarged. The dam was raised 34 feet and the reservoir's capacity was increased to 160 TAF.

The backbone of the CCWD conveyance system is the Contra Costa Canal (owned by the U.S. Department of the Interior, Bureau of Reclamation [Reclamation], and operated and maintained by CCWD). The Contra Costa Canal travels a total of 48 miles through the ECCC IRWM Region. A series of four pump stations (Pumping Plants 1 through 4) lifts the water from Rock Slough to a height of 126 feet above sea level, after which gravity propels the water to its terminus in Martinez. The canal passes through many of the cities and communities in the northeastern and central county areas before ending at the Martinez Reservoir. Water is also supplied to the canal from Old and Middle rivers via the Los Vaqueros and Middle River pipelines and from Mallard Slough. The Middle River Intake Station began operation in July 2010.

Delta Diablo Sanitation District

Agency role:

- Wastewater
- Recycled Water

The DDSD provides wastewater collection services for the unincorporated community of Bay Point, and conveyance, treatment, and disposal services for certain unincorporated areas of eastern Contra Costa County, including the community of Bay Point and the Cities of Antioch and Pittsburg.

DDSD was originally formed in 1955 and began providing subregional wastewater conveyance and treatment services in 1982. DDSD now serves an estimated population of over 188,500 residents in a service area of approximately 52 square miles. The DDSD wastewater infrastructure includes pumping stations, conveyance systems, and equalization basins in each community, a wastewater treatment plant (WWTP), and a recycled water facility (RWF) located on the Pittsburg-Antioch border. Treated wastewater is discharged in New York Slough, a section of the San Joaquin River. The WWTP has a permitted capacity of 16.5 MGD.

In 2000, DDSD began a landmark recycled water program to produce and deliver tertiary recycled water for power generation and for landscape irrigation of municipal golf courses and parks in Pittsburg and Antioch. DDSD has produced and delivered over 26 billion gallons of recycled water from 2001 to 2012.

DDSD has been involved with household hazardous waste collection since 1995, leading a multi-jurisdictional effort involving Contra Costa County; ISD; and the cities of Antioch, Brentwood,

and Pittsburg. DDSD has constructed and manages the Delta Household Hazardous Waste Collection Facility, which has diverted over 4,500 tons of waste from landfills and waterways through 2012.

In 2012, DDSD was named Plant of the Year by the San Francisco Bay Section of the Clean Water Environment Association (5 MGD to 20 MGD facilities), and also received Platinum Peak Performance Award 9 by the National Association of Clean Water Agencies for 9 consecutive years of 100 percent compliance with its discharge permit. DDSD is currently exploring opportunities in water resource recovery and is partnering with Stanford University and Lawrence Livermore National Laboratories on innovative pilot projects. DDSD is also continuing its lead role in both the Bay Area Biosolids to Energy Coalition (BAB2E) and the Western Recycled Water Coalition (WRWC).

Diablo Water District

Agency role:

- Water Supply and Quality

The DWD was formed in 1953 as a self-governing local public agency to provide water to customers in downtown Oakley. Today, DWD obtains, treats, and supplies water for about 35,000 people and the parks, schools, and businesses throughout a 21-square-mile area consisting of Oakley, Cypress Corridor, and Hotchkis Tract, as well as Summer Lakes, and portions of Bethel Island and Knightsen. It provides approximately 9.5 MGD of water, on a maximum day, to residents. Most of the water delivered by DWD is surface water supplied by CCWD. DWD purchases untreated Delta water from CCWD and treats it at the RB WTP, which DWD owns jointly with CCWD.

DWD's surface water source has been supplemented by groundwater from the Glen Park municipal well since 2006 and the Stonecreek well since 2011. DWD uses up to 4 MGD of local groundwater, which is blended with the Delta water to maintain consistent water quality for its customers. The water is then distributed through the main municipal system serving the City of Oakley. Expanded use of groundwater is an objective of DWD under its Well Utilization Project in which it seeks to develop 6 MGD to 7 MGD of well capacity to supplement surface water and improve reliability, drought supply, and operating flexibility of its system. Outside of its main distribution system, in unincorporated areas, DWD owns and/or operates a number of small community wells.

DWD's Urban Water Management Plan (UWMP) contains projections of population growth and water demand and supply from 2005 to 2040. Water demand within DWD's Sphere of Influence is expected to increase significantly as the population increases from about 28,000 in 2005 to 75,000 in 2040. This includes about 50,000 residents within the existing City of Oakley limits, 18,000 within the City's expansion areas, and 7,000 in areas outside the City, such as Knightsen and Bethel Island, portions of which are served by DWD.

DWD is in the beginning stages of converting its water meter reading system to a remote FlexNet radio read system, through which DWD staff are able to read water meters from the central office and automatically check customer accounts for leaks. It is expected that DWD will have fully converted its 11,000 meters to the FlexNet system within 10 years. If grant funding is

available, the conversion could be completed sooner, depending on the amount of funding awarded.

DWD is working with several other agencies in the area on a Regional Capacity and Efficiency study. The agencies are working to improve the efficiency of their operations in a collaborative effort.

Discovery Bay Community Services District

Agency role:

- Water Supply and Quality
- Stormwater/Flood Management
- Wastewater

The Town of Discovery Bay is located adjacent to the Delta approximately 6 miles southeast of the City of Brentwood off of Byron Highway, Interstate 4 (I-4). Discovery Bay is situated within a network of constructed lakes and channels that are connected to the Delta.

The Town of Discovery Bay Community Services District (District) was formed in 1998 to provide Discovery Bay's over 16,000 residents with water treatment, distribution, and storage. The community is largely residential with some commercial and irrigation uses. The District owns water supply wells, treatment plants, storage tanks, and distribution system pipelines that serve water through 5,523 service connections for residential, commercial, and irrigation uses in an approximate 9-square-mile area.

Most of the residential properties have docks with backyard access to the constructed channels and Delta waters. The levees and waterways of Discovery Bay are managed and maintained by Reclamation District (RD) 800 and the U.S. Army Corps of Engineers (USACE). The system is defined by relatively flat topographies with mean sea level elevations ranging from 5 feet to 15 feet across the entire system.

The District derives all of its water supply from five active groundwater supply wells. Raw water from the wells is delivered and treated at two WTPs, known as the Newport WTP and the Willow Lake WTP, with a water storage capacity of 2.5 million gallons of treated water. Storage tanks are located at each plant to provide operational equalization and reserves for fire safety. Booster facilities pump water from storage to provide the flow and pressure required in the distribution system. On a summer day, the District will pump approximately 4 MGD to 5 MGD, of which a large portion of that is being used for irrigation.

In addition, the District owns two WWTFs that treat an average of 1.8 million gallons of wastewater per day, using advanced tertiary treatment/nitrification and denitrification treatment. They system also includes 15 wastewater lift stations that transport/move the raw wastewater to the main WWTF and 60 miles of water and wastewater mains.

The water and wastewater facilities are operated and maintained by Veolia Water under a multi-year contract. Also, the District has a partnership with the University of California, Berkeley, on a multi-year "Wetlands" Trial Project to remove pharmaceuticals, salinity (salt), and certain metals from wastewater.

East Contra Costa County Habitat Conservancy

Agency role:

- Water Supply and Quality
- Watershed and Habitat

Originally formed in 2007, the ECCCHC is a joint exercise of powers authority formed by the cities of Brentwood, Clayton, Oakley and Pittsburg, and Contra Costa County to implement the ECCC HCP/NCCP.

The HCP/NCCP provides a framework to protect natural resources in eastern Contra Costa County, while improving and streamlining the environmental permitting process for impacts on endangered species. Within the 174,018-acre inventory area, the NCCP will provide permits for between 8,670 and 11,853 acres of development and will permit impacts on an additional 1,126 acres from rural infrastructure projects. The Preserve System to be acquired under the NCCP will encompass about 24,000 to 30,000 acres of land that will be managed for the benefit of 28 species, as well as the natural communities that they, and hundreds of other species, depend upon.

The NCCP will allow Contra Costa County, the CCCFCWCD, the East Bay Regional Park District, and the Cities of Brentwood, Clayton, Oakley, and Pittsburg (collectively, the Permittees) to control endangered species permitting for activities and projects in the region that they perform or approve. The NCCP also provides for comprehensive species, wetlands, and ecosystem conservation and contributes to the recovery of endangered species in Northern California.

The NCCP was approved in 2007. The permit program will be in effect until 2037. The lands acquired will be preserved and managed for species in perpetuity.

East Contra Costa Irrigation District

Agency role:

- Water Supply and Quality

The ECCID is an independent special district established in 1926 under the Irrigation District Law. The primary purpose of ECCID is to provide agricultural irrigation water to properties within ECCID. ECCID's boundaries encompass approximately 40 square miles and include the City of Brentwood, the unincorporated community of Knightsen, portions of the cities of Oakley and Antioch, and a large area of unincorporated territory south and east of Brentwood.

ECCID supplies irrigation water for agricultural and landscape use as well as raw water for treatment and delivery to urban areas. ECCID has a 1912 appropriative right to divert water from Indian Slough on Old River, and therefore has infrastructure and delivery costs but no water supply costs. ECCID also operates nine groundwater wells.

From the Indian Slough intake water is conveyed through the Main Canal that extends from the Indian Slough intake area northwest of Discovery Bay to approximately 8,000 feet west of Walnut Boulevard in Brentwood. Seven pump stations are located along the canal. A grid of open canals and pipelines runs throughout ECCID. Deliveries to approximately 50 percent of

the agricultural accounts are measured. ECCID has an ongoing program to add measuring devices for all customers.

ECCID's drainage system includes ditches for surface drainage, a subsurface drainage system, and pumps. The original irrigation and drainage system was built in 1911.

In 2012, ECCID diverted approximately 37 TAF of which 15 TAF were used for CCWD and the City of Brentwood and 22 TAF were used for agriculture.

Ironhouse Sanitary District

Agency role:

- Wastewater
- Recycled Water

Ironhouse Sanitary District (ISD) provides sewage collection and treatment and disposal services to the City of Oakley, the unincorporated area of Bethel Island, and other unincorporated areas including the East Cypress Corridor Specific Plan Area. In existence in some form since 1945, ISD utilizes a staff of 33 field and office personnel to maintain sanitary services for over 38,000 customers. Bounded by the San Joaquin River to the north, the Delta Diablo Sanitation District to the west, the City of Brentwood to the south and unincorporated area in the Holland Tract to the east, its service area is approximately 37 square miles.

The district treats approximately 2.5 million gallons of wastewater every day at their treatment facility located north of Highway 4 in Oakley. In October 2011, ISD began operation of a new 4.3 MGD membrane bioreactor WRF. Effluent from the WRF is used to irrigate 334 acres of agricultural land on Jersey Island for the production of hay, or is discharged into the San Joaquin River.

City of Pittsburg

Agency role:

- Water Supply and Quality
- Wastewater
- Stormwater/Flood Management
- Watershed and Habitat

The City of Pittsburg was incorporated in 1903 as a General Law City and has an estimated current population of around 66,000. Pittsburg is bounded by Suisun Bay to the north, the unincorporated community of Bay Point to the west, the City of Antioch to the east, and the Mount Diablo Recreation Area to the south. The Pittsburg Water Service Area comprises all of the area within the city limits, around 10,000 gross acres (15.6 square miles) and a very small number of individual residents outside. The Bay Point area outside the service area is served by Golden State Water Company (GSWC).

Originally a coal shipping port in the 1940s and early 1950s, the City was a major commercial and industrial center for the County and the eastern ports of the greater San Francisco Bay Area. Pittsburg experienced rapid population growth during the 1970s and 1980s, evolving into a bedroom community for employment centers in west and central Contra Costa County. Today the City is part of the second largest industrial center in the County.

Located within the CCWD service area, the City obtains roughly 85 percent of its water supply wholesale from CCWD. CCWD provides untreated surface water pumped from the Delta and delivered through the Canal. The remainder of the City's water supply is obtained from groundwater wells located within the City. Surface water from CCWD and groundwater from the City's wells are blended at the City's WTP and delivered to customers within the City. The City's water system includes a 32 MGD WTP, two municipal wells, seven pump stations, and eight drinking water storage reservoirs.

DDSD treats wastewater from Pittsburg, and also provides recycled water for industrial and irrigation use within the City service area.

The City and its residents are increasingly focused on quality-of-life issues. Pittsburg has been designated both a Healthy City by California Healthy Cities and Communities Project, and a Tree City U.S.A.

2.4.3. Other Water-Related Agencies within the Region

A variety of other related local and regional groups are stakeholders of the IRWM effort even if they do not maintain a formal role in its governance. The following are agencies in this category.

Bethel Island Municipal Improvement District

Agency role:

- Water Supply and Quality
- Stormwater/Flood Management

Created in 1960, Bethel Island Municipal Improvement District (BIMID) maintains the levee that protects Bethel Island and provides stormwater, seepage, and drainage control services. Its powers include not only maintaining the levee that surrounds and protects the island, but allows for many other activities, including the distribution of water for public and private purposes, parks and playgrounds, airports, and works to provide for drainage.

BIMID owns 100 acres of land in the center of the island between Bethel Island Road and Piper Road. This property is used to remove sand, which is placed on the levee, and also as a mitigation site. The state requires that for every tree BIMID removes from the island levee areas, three trees must be replanted, and they must survive for at least 2 years. New trees are planted on the mitigation site as trees are removed from the levee and drainage ditches.

Golden State Water Company

Agency role:

- Water Supply and Quality

GSWC provides retail water service for the unincorporated Bay Point community. GSWC is a wholly owned subsidiary of American States Water Company, an investor-owned utility publicly traded on the New York Stock Exchange under the trading symbol AWR. GSWC provides water service to approximately 1 out of every 36 Californians located within 75 communities throughout 10 counties in Northern, coastal, and Southern California (approximately 256,000 customers).

As of December 2011, the Bay Point Customer Service Area is a single, interconnected system with 4,918 service connections. Water delivered to customers in the Bay Point system is a blend of groundwater pumped from wells and treated surface water purchased from CCWD.

The company operates under the oversight of the California Public Utilities Commission (CPUC). Customers living in the community of Bay Point receive service from the local employees of the Bay Point Customer Service Area.

Knightsen (Town of) Community Services District

Agency role:

- Stormwater/Flood Management

The Knightsen Town Community Services District (KCSD) was created in 2005, and encompasses approximately 5,100 acres serving 1,500 people. It was formed to provide flood control and water quality (drainage services) for the community of Knightsen, which is a low area that receives runoff flow from nearby areas.

KCSD is authorized to provide only flood control and water quality (drainage services). KCSD is not actively providing these types of services at this time, but is in the planning stages to do so. Other types of services, if desired, can be provided by KCSD only with the Local Agency Formation Commission's approval.

Mutual Water Companies and Small Water Systems

Agency role:

- Water supply and quality

There are a number of mutual water companies and privately owned water systems providing service within the County. Mutual water companies (also called water companies, cooperative company, water system, water association, and water works) are a legal entity with no specific requirement for the size of the system or number of connections. It essentially means that there are shared interests in the water system and service by customers of the system. Water systems may also be investor owned, meaning that the owners, whether it be an individual or group, are not customers of the water system. Investor-owned systems are regulated by the CPUC.

In ECCC the small mutual companies supply drinking water to communities between 2 and 199 service connections; or serve 25 or more people at least 60 days out of the year. Small water systems are required to meet water quality standards of the Safe Drinking Water Act. Contra Costa Environmental Health permits and regulates all Small Water Systems in Contra Costa County, which include small Public Water Systems (Community, Non-Transient Non-Community, and Transient Non-Community Systems) and Non-Public Water Systems (State Small and County Small Systems). The CDPH also oversees systems of greater than 15 connections. **Table 2-3** lists the ECCC small systems.

Table 2-3. ECCC Small Systems

Water System	Service Connections	Population
Bethel Island		
Willow Mobile Home Park	173	350
Beacon West Water System	17	45
Farrar Park Water System	56	140
Flamingo Mobile Manor Water System	80	200
Angler's Subdivision #4	70	168
Frank's Marina	120	290
Pleasantimes Mutual Water Company	190	380
Angler's Ranch #3 Water System	45	100
Bethel Island Mutual Water Company	23	56
Riverview Water Association	86	230
Sandmound Mutual	65	160
Marina Mobile Manor Water System	24	75
Russo's Mobile Park	35	110
Oakley		
Willow Park Marina Water System	125	380
Oakley Mutual Water Company	65	170
Delta Mutual Water Company	75	180
Sandy Point Mobile Home Park	24	94
Dutch Slough Water Works	18	49

In the ECCC region all of the Mutual Water Companies rely on groundwater as a major water supply source.

Reclamation Districts

Agency role:

- Stormwater/Flood Management

There are several RDs within ECCC that provide flood protection services, including: RD 799 (Hotchkiss Tract); RD 800 (Byron Tract), RD 830 (Jersey Island), RD 2024 (Orwood and Palm Tracts), RD 2025 (Holland Tract), RD 2026 (Webb Tract), RD 2059 (Bradford Island), RD 2065 (Veale Tract), RD 2090 (Quimby Island), RD 2117 (Coney Island), RD 2121, RD 2122 (Winter Island), and RD 2137.

2.4.4. State Agencies Collaborating with the Region

Two State agencies, the DWR and the California State and regional water boards, have provided grants and technical assistance to the region. The water boards also maintain oversight over water quality and water allocation. Following is additional information on these key partners.

California Department of Water Resources

In 1956, the Legislature passed a bill creating the DWR to plan, design, construct, and oversee the building of the nation's largest State-built water development and conveyance system. Today, DWR protects, conserves, develops, and manages much of California's water supply, including the State Water Project (SWP), which provides water for 25 million residents, farms, and businesses. The mission of DWR is to manage the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments.

Working with other agencies and the public, DWR fosters public safety, environmental stewardship, and economic stability statewide by developing strategic goals, and near-term and long-term actions to conserve, manage, develop, and sustain California's watersheds, water resources, and management systems. DWR also works to prevent and respond to floods, droughts, and catastrophic events that would threaten public safety, water resources and management systems, the environment, and property.

DWR has a number of IRWM grant program funding opportunities. The 2013 IRWM grant programs include: planning, implementation, and stormwater flood management.

Balancing the State's water needs with environmental protection remains a long-term challenge. The Delta Habitat Conservation and Conveyance Program is a key initiative currently underway to promote the recovery of endangered, threatened, and sensitive fish and wildlife and their habitats in the critically important Delta in a manner that will also ensure water supply reliability for the State.

Water Boards

The State Water Resources Control Board (the State Water Board) was created by the Legislature in 1967. The mission of the State Water Board is to ensure the highest reasonable quality for waters of the State, while allocating those waters to achieve the optimum balance of beneficial uses. The joint authority of water allocation and water quality protection enables the State Water Board to provide comprehensive protection for California's waters.

There are nine regional water boards. The mission of the each water board is to develop and enforce water quality objectives and implementation plans that will best protect the beneficial uses of the State’s waters, recognizing local differences in climate, topography, geology, and hydrology.

The water agencies in the ECCC IRWM region all fall within the jurisdiction of the Central Valley Water Board (Region 5). There are some agencies (CCWD, DDSD, and the City of Pittsburg) that fall in both the San Francisco Bay Water Board (Region 2) and the Central Valley Water Board (Region 5). The remaining regional entities lie entirely within the Central Valley Water Board.

2.5. Description of Social and Cultural Makeup

Based on 2010 Census and California Department of Finance data, UWMPs, industry data projections, and other related sources, such as topical research studies, ECCC is a complex mix of races, ages, education, and prosperity. Composed of approximately 330,000 people, the residents of Antioch, Bay Point, Brentwood, Byron, Discovery Bay, Knightsen, Oakley, and Pittsburg do not fully mirror the rest of California. The community is far more diverse and has a large population of children. This trend is so pronounced, regional post-secondary schools have commissioned studies to monitor a future influx of students, who at the time of this report, are all under the age 10.[1]

There are minor variations in the population studies and reported numbers due to the time of collection, boundaries of the study areas, and limitations with the collection processes; however, there is general consistency. As such it is possible to identify trends and discern the implications that can be drawn.

2.5.1. Demographics

Table 2-4 below provides key demographic facts and illustrates how ECCC compares to the State and nation.

[1] **Projected Population Changes in Contra Costa County and Their Implications for Contra Costa Community College District**, Prepared for Contra Costa Community College District Office by Hanover Research Council, January 2010. Contra Costa. Includes full district boundaries, including eastern Contra Costa County.

Table 2-4. Demographics Data for the ECCC Region

People Quick Facts[1]	ECCC	California	USA
Population, 2010	330,000	37,253,956	308,745,538
Persons under 18 years, percent, 2011	29%	24.6%	23.7%
Persons 65 years and over, percent, 2011	9%	11.7%	13.3%
Females	51%	50.3%	50.8%
Whites	53%%	74.0%	78.1%
Blacks	13%	6.6%	13.1%
American Indian and Alaska Native persons	0.1%	1.7%	1.2%
Asians, percent	10%	13.6%	5.0%
Native Hawaiians and Other Pacific Islanders	0.1%	0.5%	0.2%
Hispanics or Latinos (of any race)	35%	38.1%	16.7%
Persons reporting two or more races	7%	3.6%	2.3%
Other	15%	n/a	n/a
Bachelor's degree or higher,	19.1%%	29.4%	28.2%
High school graduate or higher	80.7%	80.8%	85.4%

Note:
[1] Where appropriate, figures are rounded to whole numbers and for that reason may not total 100%. Some ECCC numbers are based on 2009 and 2010 data sets, rather than the 2011 projection used for national and statewide numbers. Additional calculations will be needed if this chart is used for more than illustrative purposes.
Key:
ECCC = East Contra Costa County
n/a = data not available
USA = United States of America

2.5.2. Demographic Analysis of Contra Costa County in 2009 and 2019

The Contra Costa Community College District (CCCCD) recently retained the Hanover Research Council to analyze demographic trends in Contra Costa County. They specifically focused on age, race/ethnicity, nationality, and gender. While the analysis considered potential implications of the changes for CCCCD, some aspects of the information have direct utility for ECCC.

2.5.3. Age

Contra Costa County is expected to experience significant population growth over the next 10 years with much of the County growth occurring in ECCC. The proportion of residents in some age groups will diminish or increase only slightly, while the relative proportion of other age groups will increase substantially. Both the decreases and increases are concentrated among a few adjacent age groups. According to the Hanover report, "overall Contra Costa will experience a significant decrease in the number of residents aged 40 to 54 years. Indeed, from 2009 to 2019, the total population in this age group will decrease by over 23,000, or 9 percent. Furthermore, the proportion of residents in this age group, relative to the total population, will also decline markedly, from 22.7 percent to 18.2 percent. This demographic shift represents a significant loss of working-age residents."

At the same time, models predict larger numbers of children under the age of 10 living in the County. While age per se is not a water management issue, the profile of a community has many

implications for competing interests for service, Also to be considered is the degree of flexibility of those on fixed incomes and the ability to adjust to rate changes or support investments in infrastructure. A large number of children may change service demands and at the same reduce discretionary income.

2.5.4. Ethnicity

Also projected for significant change is the racial-ethnic composition with those originating from Hispanic and Asian heritage becoming a larger percentage of the population. This trend indicates a need for service models able to accommodate more than one langrage. Some additional research may be also needed on the best ways to communicate with multiple cultures on water use efficiency or other water policy initiatives. Additional thinking will be needed on all forms of public outreach and engagement.

2.5.5. Gender

No significant trends were seen in County data for gender.

2.5.6. Economic Industry

Industry and agriculture are important to the ECCC economy. Approximately 30 percent of water use is attributable to major industry within the region, including USS-Posco (steel finishing plant), Delta Energy Center (electric generation), LMEC (electric and steam generation), and Gaylord Container and Inland Paperboard & Packaging (corrugated boxes, shipping materials) as major contributors. The Milken Institute, a nonprofit, nonpartisan think tank, with the support of Chevron, the Contra Costa Economic Partnership, and the Contra Costa Council, completed an assessment of the Contra Costa economic climate in October 2012.

That report outlined key economic challenges the County faces. Of particular interest is contraction in its industrial base and unbalanced economic growth across the County. In the early 1990s, manufacturing was the key driver of the economy. Over 12 percent of private-sector jobs were concentrated in manufacturing in 1990, compared to less than 7 percent in 2010.

Petrochemical, steel, and confectionery products still maintain a good jobs outlook but the local manufacturing base has shed more than 10,000 jobs since 1990. As heavy manufacturing diminished, former workers faced challenges in acquiring new skills and adapting to new industries, contributing to rising unemployment. In the early 1990s, the jobless rate was much lower in Contra Costa than in the wider Bay Area. However, over the past 2 decades, that trend has reversed.

Antioch and Pittsburgh are among 2 of the 19 cities in the county responsible for 95 percent of employment. Both continued to add jobs to the service sector, however slowly, during the recent recession. The availability of land and relatively low business costs makes them ideal choices for land-intensive businesses. Pittsburg is a prominent manufacturing center and assets include an enterprise zone where business incentives are available. Pittsburgh's recent economic development plan has the city promoting strategies that capitalize on this.

However, Antioch, along with Pittsburg, faces a severe shortage of high-skilled labor, which helps explain its weak performance in knowledge-based industries, compared to the Bay Area

and to Contra Costa overall. This shortcoming will likely continue to impede the development of a more diverse economy.

Southern portions of ECCC are predominantly unincorporated and agricultural lands. More than 80,000 acres in ECCC are designated for agricultural use, and 99 percent of this land is located in unincorporated areas. Agricultural lands are generally used for crops, vineyards, and rangelands. Crops grown in ECCC include nursery crops, vegetables, fruits, and nuts, with nuts being the most profitable. Because of the region's dependence upon Delta water supplies, events that threaten the quality or quantity of this supply, such as droughts, water quality events, and levee failures, could have significant ramifications on the economic viability of the entire region.

2.5.7. Disadvantaged Communities

Like the State of California, the ECCC region is committed to promoting equitable distribution of IRWM Plan project benefits, and especially to addressing the critical water supply needs of disadvantaged areas. A DAC is a term defined by the California Public Resources Code (PRC), Section 75005(g): *"Disadvantaged community" means a community with a median household income (MHI) less than 80% of the statewide average. "Severely disadvantaged community" means a community with an annual MHI less than 60% of the statewide average.*

Related but somewhat different are environmental justice (EJ) concerns. As defined by the U.S. Environmental Protection Agency (EPA), "Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

The ECCC region faces special challenges as many residents reside in DACs. A lack of community resources can impact the ability of ECCC members to obtain additional resources for water-related needs. Yet, even with the recent economic downturn and the attendant issues of disproportionate DAC numbers, growth is still occurring. All indications point to an increased need for water-based infrastructure and services, now and into the future.

The current DWR guidelines for IRWM funding, allocated through voter-approved Propositions 84 and 1E, identify statewide priorities among which is a goal to "ensure equitable distribution of benefits." For implementation grants, DWR has prioritized proposals that:

- Increase the participation of small communities and DACs in the IRWM process
- Develop multi-benefit projects with consideration of affected DACs and vulnerable populations
- Address safe drinking water and wastewater treatment needs of DACs

Delineating DACs

Delineating the DACs is often done by census tract, as data and boundaries are available. Even so, the California PRC is not specific as to how DACs are delineated, so different methods of determining the boundaries of a DAC can be considered valid by DWR.

The U.S. Census Bureau's American Community Survey (ACS) includes MHI data compiled for the 5-year period from 2006 to 2010. A community with an MHI of $48,706 or less is

considered a DAC. The U.S. Census collects and compiles data for multiple census geographies including Place, Block Group, and Tract. A census tract is a region defined for the purpose of taking a census and usually coincides with city boundaries, towns, or other administrative areas. The United States defines census tracts as "relatively homogeneous units with respect to population characteristics, economic status, and living conditions, census tracts average about 4,000 inhabitants." **Figure 2-7** shows the census tracts within the ECCC region that are considered DACs. These include the census tracts containing the Beacon West community on Bethel Island, as well as portions of Bay Point, and the Cities of Antioch and Pittsburg.

Census tract groups that qualify as DACs cover an area of 41,079 acres, or approximately 19 percent of the geographic area of the region and approximately 23 percent of the total population. The MHIs of the DACs identified in **Figure 2-7** range from $27,078 to $48,125, with an average MHI of $41,283.

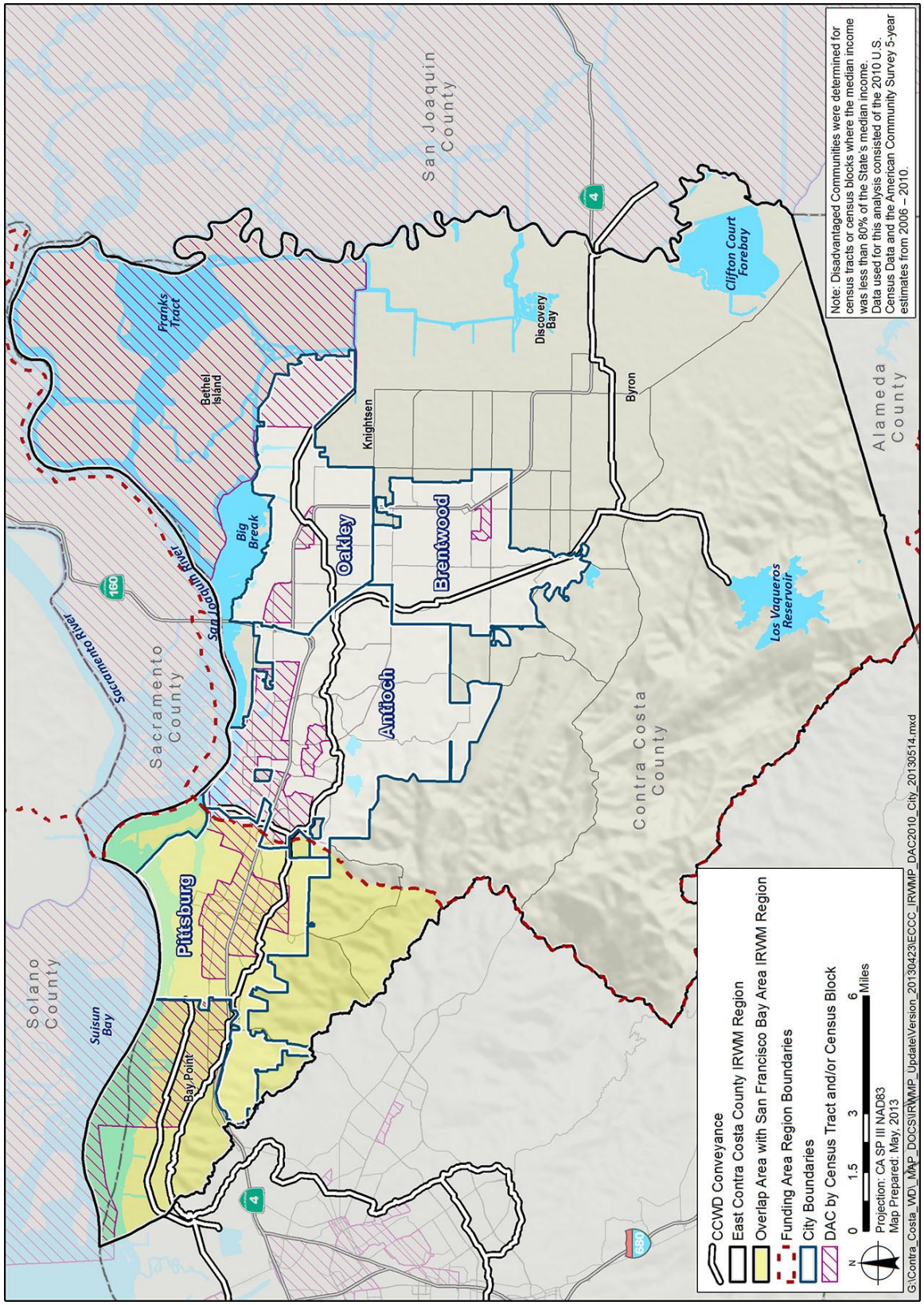


Figure 2-7. Disadvantaged Communities in the Region

Other Vulnerability Factors

As described in the previous Sections 2.5.1 and 2.5.2, the region already experiences potential vulnerabilities related to the age and education of citizens and the future employment picture, which exacerbates the situation for DACs. In addition to those already mentioned, ECCC was disproportionately affected by the recent foreclosure crisis. While access to adequate housing is a continual crisis in California, homes lost to foreclosure increased over 200 percent in 2007, compared to 2006. Contra Costa County had an even more alarming 290 percent rate with 3,500 County homeowners receiving Notices of Default in the fourth quarter of 2007.[2] For a variety of reasons related to the housing boom and widespread predatory lending, ECCC was especially impacted. Foreclosures in one ZIP Code in Antioch affected one of every 18 homes. For comparison, ZIP Codes in Richmond's Iron Triangle had a comparative rate of one of every 25 homes.

The plight of the DACs cannot be untangled from those of the water utilities. Issues related to foreclosure and neighborhood blight are particularly hard hitting for utilities as rate structures and bond repayment schedules depend on infrastructure being used, maintained, and paid for. **Figure 2-8** illustrates the relative impact of foreclosures on the County.

[2] The Geography of Foreclosure in Contra Costa County California, Kristin Perkins, UC Berkeley, July 2008. Master's Thesis.

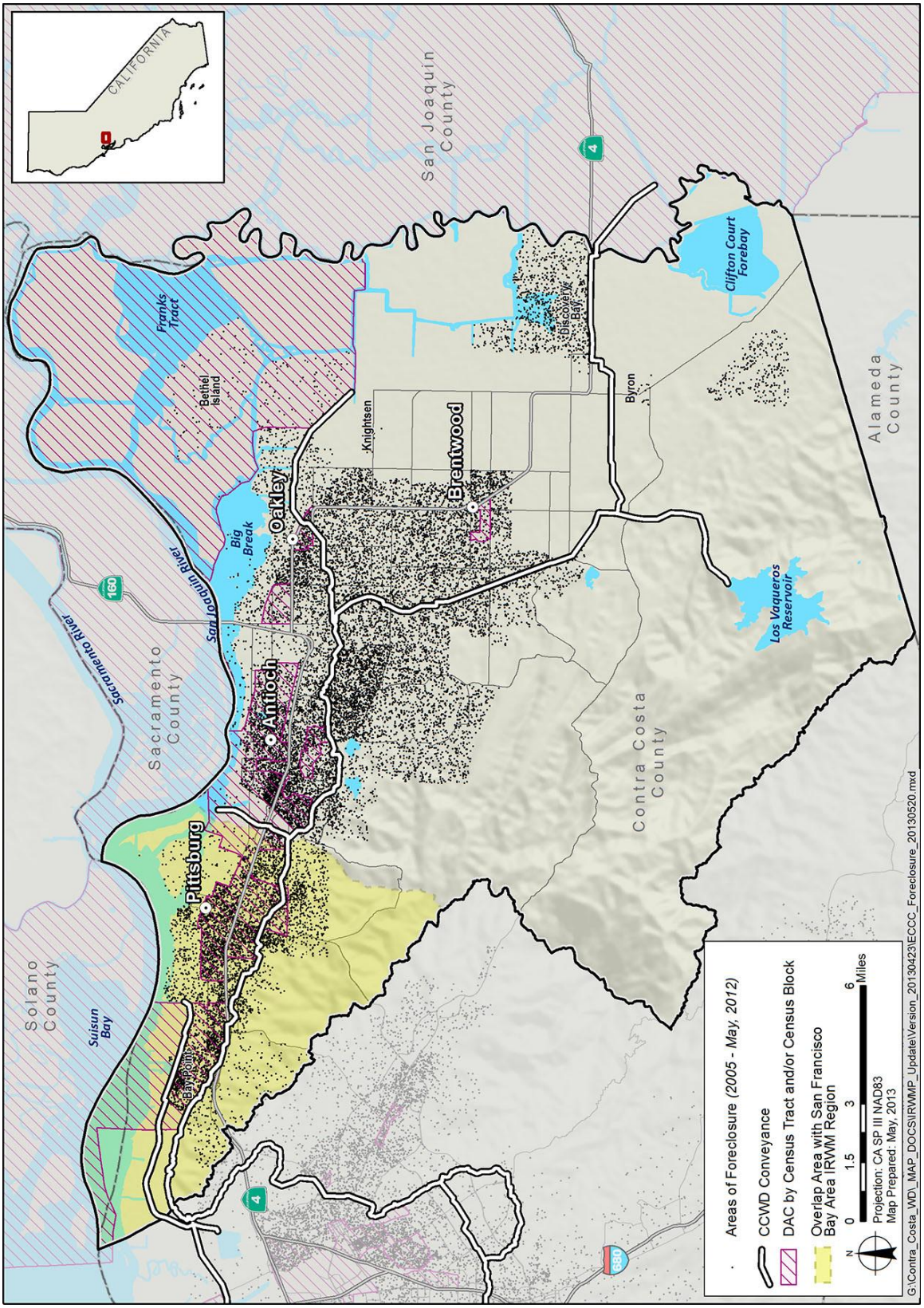


Figure 2-8. Impact of Foreclosures on Contra Costa County

Water Supply and Water Quality Needs

Many of the critical water supply and water quality needs of DACs in eastern Contra Costa County are typical of communities throughout the state. The primary water supply and water quality issues facing DACs relate to a strong reliance on Delta supplies, a need to maintain compliance with applicable drinking water standards, and the threat of damage from flooding. Critical water supply needs of DACs in the ECCC region include:

- Improved water supply reliability/reduced reliance on Delta supplies
- Water quality of groundwater supplies used to supplement Delta supplies
- Infrastructure renovations necessary to assure continued reliability of the minimum quality and quantity of water
- Affordability programs to offset the rising costs of water service

All of the water suppliers within the ECCC region rely on Delta supplies. The three water suppliers in eastern Contra Costa County that purchase untreated/treated Delta supplies from CCWD provide supplies to the bulk of the DACs in the region. Because of the region's heavy dependence upon Delta water supplies, events that threaten the quality or quantity of this supply could have significant ramifications on the economic viability of the entire region. This may be of particular concern for DACs, where economic conditions are below the statewide average. Further, the rising cost of water in the region is a critical water supply-related issue for DACs. Agencies must continually balance the need to improve supply reliability through implementation of aggressive conservation, water recycling, potentially expensive groundwater treatment, and even desalination with a need to maintain water affordability for DACs. With the rising cost of service, access to drinking water threatens to become a luxury for DACs in eastern Contra Costa County.

Some of the more remotes areas of the region, including the DAC of Bethel Island (which the Beacon West community is located on) are entirely reliant on groundwater for potable water supplies. Beacon West is supplied with drinking water from a well operated and maintained by DWD. The Beacon West well has arsenic levels exceeding standards issued by the CDPH. Similarly, the proposed Rossmoor Well Replacement, Groundwater Monitoring Well System Expansion is necessary to correct severe capacity deficiencies due to biofouling of a groundwater well serving a DAC. The area benefiting from this project includes DAC census tracts within the City of Pittsburg.

Flood

Still another concern is the exposure of regional DACs to flood events and a need for flood and stormwater management projects designed to protect DACs from flooding impacts. In general, DACs often have more overall risks (lack of flood insurance and flood proofing, and historic land-use patterns placing communities in floodplains) and fewer resources available to recover from inundation. Recovery from a flood event can have catastrophic economic consequences for a DAC even if immediate life/safety issues are managed.

Overlap Area

As described in Section 2.4, Pittsburg and portions of Antioch and the County are located in an area that partially overlaps the ECCC IRWM region and the San Francisco Bay Area IRWM region. **Figure 2-9** shows the location of the overlap with respect to the San Joaquin and San Francisco Bay funding areas. The map also shows the DAC locations in the vicinity.

As shown in **Figure 2-9** approximately 2 percent of the City of Pittsburg is located wholly within the San Joaquin area, with the remaining 98 percent located in the overlap area. Conversely, approximately 99 percent of the City of Antioch is located wholly within the San Joaquin funding area, with only 1 percent located in the overlap area. The Bay Point Area, which sits slightly northwest of Antioch, is fully in the San Francisco Bay funding overlap area.

Approximately 27 percent of the City of Pittsburg (by geographical area) is a DAC, and 45 percent of the City of Pittsburg is a DAC based on population (27,849 people out of 61,723). Of the portion of the City of Pittsburg classified as a DAC, approximately 98 percent (by population) is located in the overlap area and 2 percent is located in the San Joaquin funding area. Similarly, 16 percent of the City of Antioch is a DAC based on geographic area, or 19 percent by population. Of the DACs located in the City of Antioch, 4 percent (by population) are located in the overlap area and 96 percent are located in the San Joaquin funding area. Approximately 71 percent of the geographical area of Bay Point is DACs (or 73 percent of its total population). Because Bay Point is fully contained within the overlap area, coordination with the San Francisco Bay IRWM will be essential to ensure the needs of this community are met.

Both the ECCC and San Francisco Bay IRWM regions recognize the importance of implementing projects in the overlap area, particularly due to the high proportion of DACs residing in this area. The two regions are currently collaborating to develop a mutually agreeable approach to defining beneficiaries of projects in the overlap area.

Engagement

The ECCC region has maintained a transparent and open process in which DAC representatives are always welcome, and an easily navigated project Web site allows 24-hour access to information. Cities such as Pittsburg and Antioch maintain close connections with the DACs through elected local leadership and consolidated planning processes.

For example, Antioch, using the U.S. Department of Housing and Urban Development's Community Development Block Grant Program, conducts needs assessments that describe the City's non-housing community development needs, its housing needs and market conditions, sets out a 5-year strategy identifying priorities and available resources, and establishes a One-Year Action Plan that outlines intended uses of the resources. Extensive public outreach is conducted and input received to determine funding priorities for a 5-year period. To view Antioch's priorities for funding projects, please see the City's Web site. Further, outreach to DACs included the Municipal Advisory Councils. Contra Costa County has various Municipal Advisory Councils whose purpose is to advise the County Board of Supervisors on land use and planning matters affecting their communities of interest.

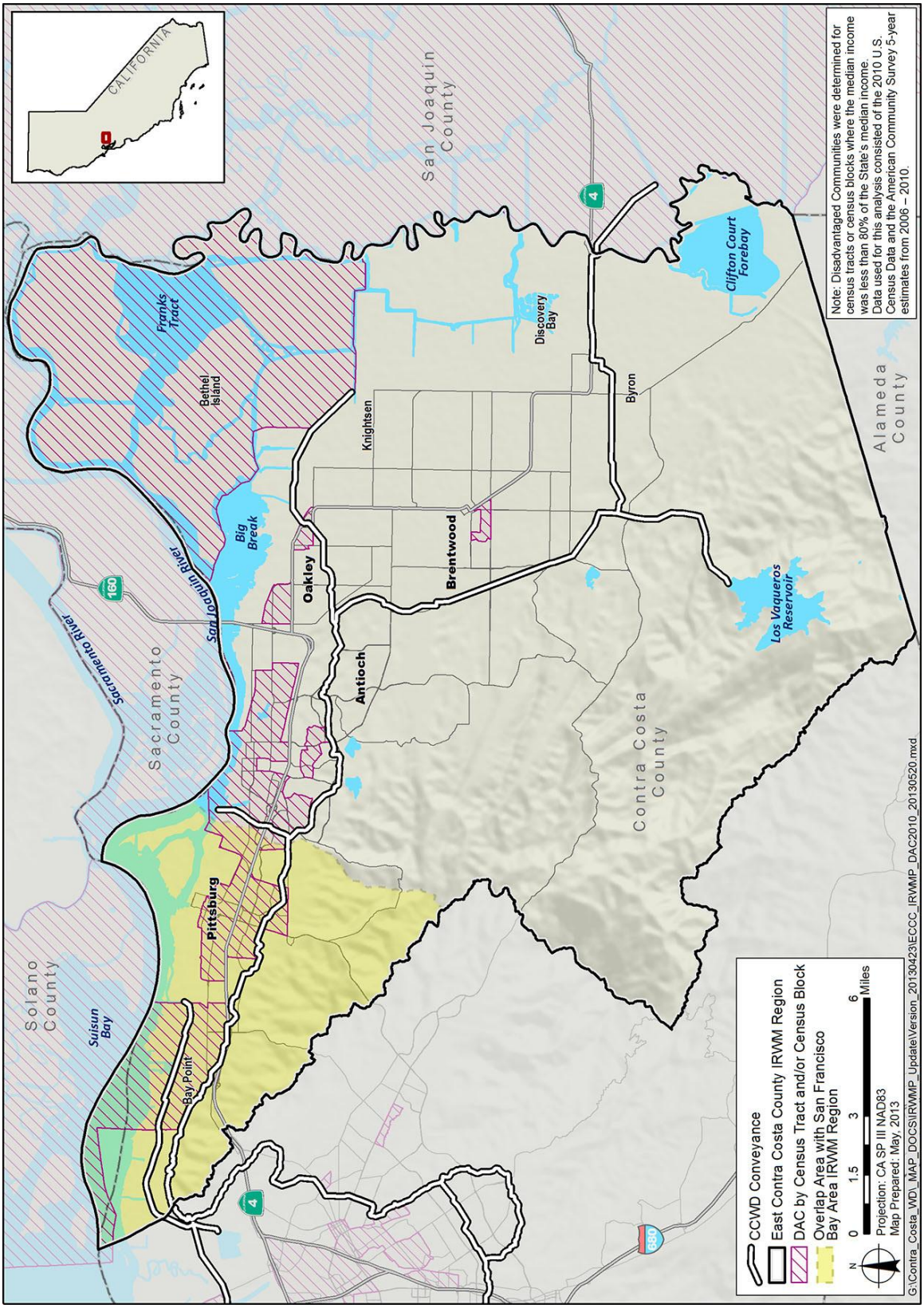


Figure 2-9. Location of ECCC Overlap in Relation to Regional Boundaries and DACs

All four of the Municipal Advisory Councils in the region–Bay Point, Bethel Island, Knightsen, and Byron–contain DACs within their boundaries or in their adjacent Special Notification Areas, and are therefore a natural conduit for the IRWM process to reach DACs outside incorporated areas such as the Cities of Pittsburg and Antioch. Targeted outreach to Municipal Advisory Councils allows for direct and structured engagement with the greater parts of the unincorporated areas of the region.

2.6. Description of Watersheds and Water Systems

Watersheds and water systems within the ECCC region are defined by hydrological features, geological conditions (in the case of groundwater basins), and meandering Delta waterways. This section describes the region's major watersheds and water systems.

2.6.1. Watersheds

Watershed Management Areas

The ECCC region is defined by natural watershed boundaries. The western boundary is the ridgelines of Mount Diablo and the northern boundary is the Delta. The eastern boundary is Old River/San Joaquin River. The southern boundary is the county line with Alameda County. The ECCC region spans two State-defined hydrologic regions–the San Francisco Bay Hydrologic Region (regulated by the San Francisco Bay Water Board) and the San Joaquin River Hydrologic Region (regulated by the Central Valley Water Board). The majority of the region lies within the San Joaquin River Hydrologic Region.[3] **Figure 2-2** displays the boundaries between the two hydrologic regions and regional water board jurisdictional areas.

Watersheds

The agencies participating in and supporting this effort span nine watersheds,[4] all entirely within the ECCC region. These watersheds are the Willow Creek, Kirker Creek, East Antioch Creek, West Antioch Creek, Upper Marsh Creek, Lower Marsh Creek, East County Delta Drainages, Kellogg Creek, and Brushy Creek watersheds. Drainage from several watersheds intersects Delta waterways to the north and east. Major creeks in these watersheds generally flow from south to north, discharging into Suisun Bay and the Delta. The boundaries of these watersheds, and their proximity to the Bay and Delta, are presented in **Figure 2-10**, and additional information on each watershed is provided below.

Willow Creek Watershed

The Willow Creek Watershed is found in the northwestern ECCC region, bounded by the Sacramento River to the north. Bay Point and the City of Pittsburg are within the Willow Creek Watershed. This watershed drains into the Delta and is approximately 23.6 square miles in size (11,370 acres). All drainages in this watershed are ephemeral. Its landscape is diverse and includes grasslands, wetlands, and municipal and industrial uses.

[3] For water planning and conservation purposes, DWR and the State Water Board divided the State into 10 hydrologic regions. These 10 hydrologic regions are geographic areas that contain the DA of a major river or series of rivers. Source: CWP, Update 2009, Hydrologic Regions Map, DWR.

[4] A watershed is an area of land that drains precipitated waters to a given reference point, typically a confluence with another major creek or large water body. Source: Contra Costa County Watershed Atlas (2003).

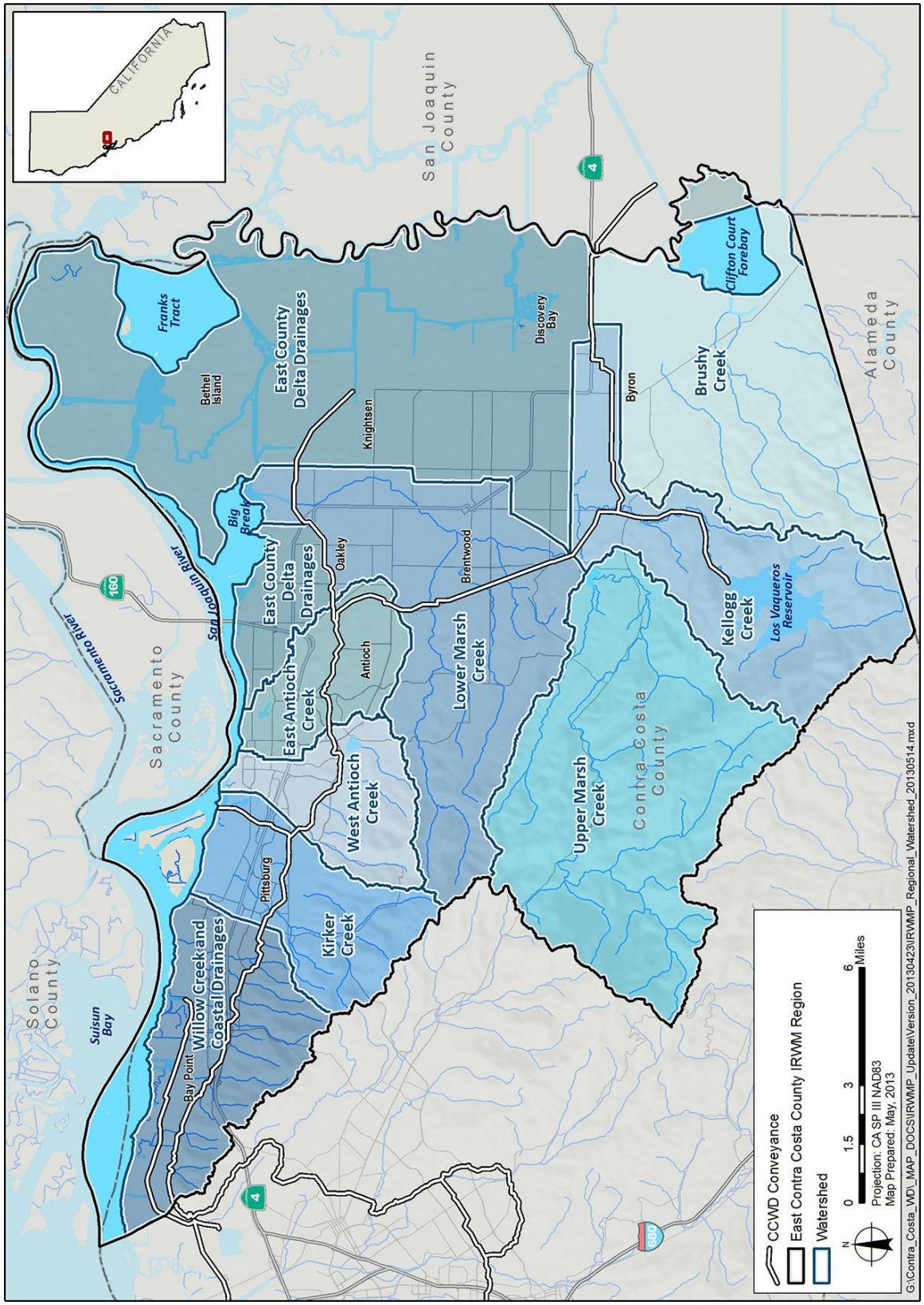


Figure 2-10. Watersheds in the Region

Kirker Creek Watershed

The Kirker Creek Watershed lies east of the Willow Creek Watershed. The City of Pittsburg falls within the Kirker Creek Watershed. Kirker Creek originates in Black Diamond Mines Regional Preserve and drains to the Delta and is approximately 15.8 square miles in size (9,500 acres). The drainages in this area are mostly ephemeral, though in some lower reaches of the watershed the creeks are perennial due to artificial inputs. This watershed includes regional parkland, ranchland, urban, and municipal and industrial uses. Its landscape is diverse and includes grasslands, wetlands, and urban areas. The lower portion of this watershed includes channelized conditions connected with an extensive stormwater drainage system to accommodate areas of suburban development. A community watershed group, Partners for the Watershed, is active in the area and organizes creek cleanups and creek monitoring. Two projects funded through the IRWM Plan grant process have been funded in this watershed, and have contributed to approximately 460 acres of conservation open space and restoration of wetlands and creeks in the upper watershed.

West and East Antioch Creek Watersheds

The West and East Antioch Creek watersheds lie east of the Kirker Creek Watershed and are bounded by the San Joaquin River to the north. The City of Antioch falls within these watersheds. These watersheds drain the north side of the Mount Diablo foothills into the Delta. The East Antioch Creek Watershed is approximately 11.4 square miles in size (7,261 acres). This area is heavily urbanized and numerous detention basins have been installed to manage and control flood flows. The Dow Wetland Preserve is at the mouth of the creek along the San Joaquin River and is an area that has been restored and is maintained by volunteers. The area is used for environmental education and outreach in the area. The West Antioch Creek Watershed is approximately 12.8 square miles in size (8,180 acres). West Antioch Creek originates in Contra Loma and Black Diamond Mine Regional Preserve. The Contra Loma Reservoir and the Antioch Reservoir capture most of the water that leaves the foothills. Most of the drainages in these watersheds are ephemeral with lower parts flowing perennially due to artificial inputs The lower portion of this watershed includes channelized conditions connected with an extensive stormwater drainage system to accommodate areas of suburban development.

Upper and Lower Marsh Creek Watersheds

South of the Antioch Creek Watershed is the Marsh Creek Watershed, which contains portions of the cities of Antioch, Brentwood, and Oakley, as well as unincorporated areas south and west of Brentwood in the ECCC region. This is the second largest watershed in the County, and the largest in eastern Contra Costa County. The watershed drains into the Delta through the Dutch Slough area and is approximately 94 square miles in size (60,066 acres). The Upper Marsh Creek Watershed drains parts of Mount Diablo and includes steep, rocky conditions. Though this area is predominantly undeveloped, historical land uses have impacted this area, including an abandoned mercury mine. The upper watershed drains to the Marsh Creek Reservoir. The Lower Marsh Creek Watershed includes agricultural and urban centers. The creek channel in the lower watershed has been altered to protect the surrounding land uses. The lower watershed also includes grasslands, wetlands, and municipal and industrial uses. The Friends of Marsh Creek is an active community group that meets regularly, organizes creek cleanups, monitors the creek and are stewards of the watershed. A fish ladder was constructed in lower Marsh Creek to support anadromous fish that use Marsh Creek. This project was funded in part by IRWM Plan grant funds.

East County Delta Drainages

East of the Marsh Creek Watershed is the East County Delta DA. This area includes eastern Oakley, Bethel Island, and Knightsen, as well as the District. This watershed flows into Old River and the San Joaquin River. It is approximately 88 square miles in size (56,223 acres). This watershed includes the County's agricultural core. Numerous irrigation canals and channels crisscross the area, dramatically altering the natural hydrology. The region supports more alkali habitats than the western watersheds. The comparatively flat topography, seasonal flooding, and agricultural (active and passive) support a different collection of flora and fauna. For many species, eastern Contra Costa County is the northwestern reach of their range. The landscape is a mix of grasslands, wetlands, agriculture, and municipal and industrial.

Kellogg Creek Watershed

South of the East County Delta Drainages is the Kellogg Creek Watershed, which includes Byron. The 160,000 TAF Los Vaqueros Reservoir is located within the Kellogg Creek Watershed. CCWD owns and operates the reservoir, along with approximately 20,000 acres of protected watershed lands managed for water quality, conservation, and recreation. This watershed flows into Old River (and eventually into the San Joaquin River). It is approximately 20,863 acres in size. Kellogg Creek has been heavily altered due to its historical use for agriculture. Mallory Creek and several small unnamed creeks are tributaries to Kellogg Creek. Kellogg Creek inflows of up to 5 cubic feet per second are required to be passed through the reservoir as outflow to meet downstream water rights that were in place before construction of the reservoir in 1998. Reservoir releases are also made to support constructed wetlands that were created by CCWD as mitigation for the original Los Vaqueros Reservoir Project.

Brushy Creek Watershed

The Brushy Creek Watershed is found east of the Kellogg Creek Watershed in the southeastern corner of the ECCC region. There is no urban development; the watershed is currently used for agriculture. This watershed flows into Old River and the Clifton Court Forebay (and eventually into the San Joaquin River). It is approximately 24,422 acres in size. Brushy Creek is the principal creek and has numerous unnamed tributaries connected to it.

Groundwater Basins

The groundwater basins underlying ECCC can be seen in **Figure 2-11**. The ECCC region partially overlies the Pittsburg Plain and Clayton Valley groundwater basins, and partially overlies the Tracy Subbasin of the San Joaquin Valley Groundwater Basin. Groundwater is an important source of supply for agricultural and domestic uses, and to a lesser extent, municipal and industrial uses. Groundwater use throughout the ECCC region, relative to surface water use, is small and on the order of about 10 percent of total water demands, or approximately 10 TAF. More information about groundwater use in the region is discussed in Section 2.7 and is available in GMPs. Groundwater will continue to be an important resource for the region as a principal supply for agricultural and rural areas, and as a supplemental supply for the developed areas.

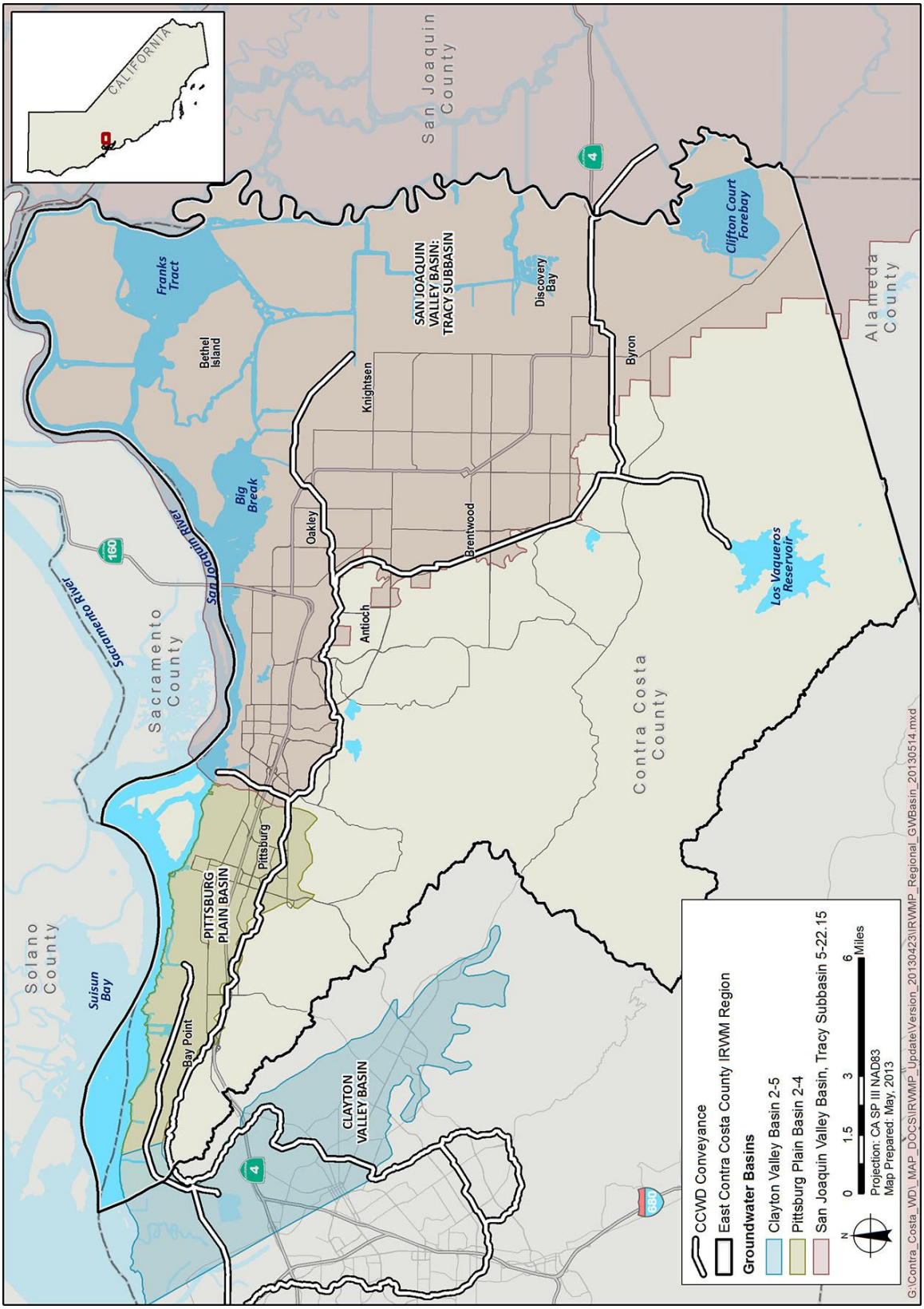


Figure 2-11. Groundwater Basins in the Region

Pittsburg Plain Groundwater Basin

The Pittsburg Plain Groundwater Basin (DWR Basin Number 2-4) is located along the southern shore of Suisun Bay. It is bounded by Suisun Bay to the north, the Tracy Subbasin (DWR Subbasin 5-22.15) to the east, and the Clayton Valley Groundwater Basin (DWR Basin 2-5) to the west, and includes the overlying City of Pittsburg and the community of Bay Point. Aquifer units beneath the city consist of north-dipping sand and gravel material under confined to semiconfined conditions. To the south, a deeper zone, where most of the basin groundwater production occurs, is close to the ground surface and appears to interbed with the sandy clay surface layer. Similar hydrogeological conditions are expected in the western portion of the basin near Bay Point, though the ability to characterize the hydrogeology of this portion of the basin is limited by a lack of data. Groundwater flow appears to be generally to the north-northeast toward Suisun Bay, which defines the northern border of the basin. The City of Pittsburg prepared the Pittsburg Plain Groundwater Basin GMP in 2012 (Section 3.5.1). The City of Pittsburg also prepared a Salt and Nutrient Management Program Summary in 2012 (Section 3.5.2) that reported groundwater quality conditions of the basin.

San Joaquin Valley Groundwater Basin: Tracy Subbasin

The Tracy Subbasin (DWR Basin Number 5-22.15) makes up the northwestern most portion of the San Joaquin Valley Groundwater Basin around the Delta and extends south into the central portion of the San Joaquin Valley. Subbasin boundaries are defined by the Mokelumne and San Joaquin rivers on the north, the San Joaquin River on the east and the San Joaquin-Stanislaus County line on the south. The western subbasin boundary is defined by the contact between the unconsolidated sedimentary deposits and the rocks of the Diablo Range. DWD prepared the GMP for this Tracy Subbasin in 2007. In 2012, DWD completed a Data Gap Analysis (Section 3.5.3) to determine the data needed to calculate the basin's safe groundwater yield.

Clayton Valley Groundwater Basin

The Clayton Valley Groundwater Basin (DWR Basin Number 2-5) underlies a small portion of the region, in its northwestern corner along the south shore of Suisun Bay. It is bounded by Suisun Bay on the north, Mount Diablo Creek on the east, the Concord Fault on the west, which divides and separates this basin from the Ygnacio Valley Groundwater Basin, and the foothills of Mount Diablo on the south. Marsh Creek flows through the basin before emptying into Suisun Bay. The basin is underlain by thick alluvial deposits that cover a faulted and folded complex of consolidated Cretaceous and Tertiary rocks. The water-bearing units in the basin can be found in the Recent Alluvium and the Older Alluvium valley fill deposits.

2.6.2. Infrastructure

Major Water Supply Infrastructure

A variety of water infrastructure is located within the ECCC region, including water bodies, reservoirs, conveyance facilities, pumping plants, and WTPs and WWTPs. Major water supply and wastewater infrastructure within the ECCC region is shown on **Figure 2-12**. Among the major water infrastructure are the Clifton Court Forebay (DWR), Canal (Reclamation and CCWD), and Los Vaqueros Reservoir (CCWD).

Clifton Court Forebay

Located in ECCC, the Clifton Court Forebay is a regulated reservoir located at the head of the SWP's California Aqueduct, with intake facilities located on Old River. The SWP is the nation's

largest State-built water and power development and conveyance system, conveying Delta supplies from the ECCC region to 23 million Californians and 755,000 acres of irrigated farmland throughout California.

Contra Costa Canal

The Canal is the oldest unit of Reclamation's CVP. It was originally constructed to serve agricultural needs, and now comprises the backbone of CCWD's untreated water conveyance system. The Canal conveys water from the Delta to CCWD's treatment facilities and untreated water customers. The Canal spans 48 miles, starting at Rock Slough in the ECCC region, passing through several communities including the Cities of Oakley, Antioch, Pittsburg, and Bay Point, and ending at the Terminal Reservoir in Martinez. Water is drawn from Rock Slough near Knightsen (8 miles east of Antioch). Water travels from Rock Slough through a 4-mile stretch of unlined channel before entering the concrete-lined section of the Canal in Oakley. CCWD is working on a plan to convert the unlined portion of the Canal (Canal Project) into a pipeline as a means of improving water quality, public safety, and reducing flood risks. Approximately 2 miles of the unlined Canal is adjacent to the proposed DWR Dutch Slough Tidal Restoration Project (Restoration Project). CCWD is working with DWR to coordinate the construction of the Restoration Project and the Canal Project. The Canal can also receive untreated water from Old and Middle rivers or the Los Vaqueros Reservoir around Milepost 7 in Antioch via the Los Vaqueros Pipeline.

Los Vaqueros Reservoir

CCWD owns and operates the Los Vaqueros Reservoir, which stores up to 160 TAF of high-quality water. The reservoir is supplied from the Delta at Old River and on Victoria Island off of Victoria Canal (Middle River). The reservoir is surrounded by nearly 20,000 acres of protected watershed, providing more than 55 miles of recreational trails. CCWD expanded the Los Vaqueros Reservoir from 100 TAF to 160 TAF in 2012. The California Bay-Delta Program (CALFED) Los Vaqueros Expansion Studies are currently examining the feasibility of expanding the reservoir to provide water quality and water supply reliability benefits to downstream Delta users, helping to achieve CALFED water quality objectives. Los Vaqueros Reservoir is not operated to provide flood protection, but has reduced the watershed area that drains to Kellogg Creek, which has a significant floodplain, since is it operated not to spill during large storm events.

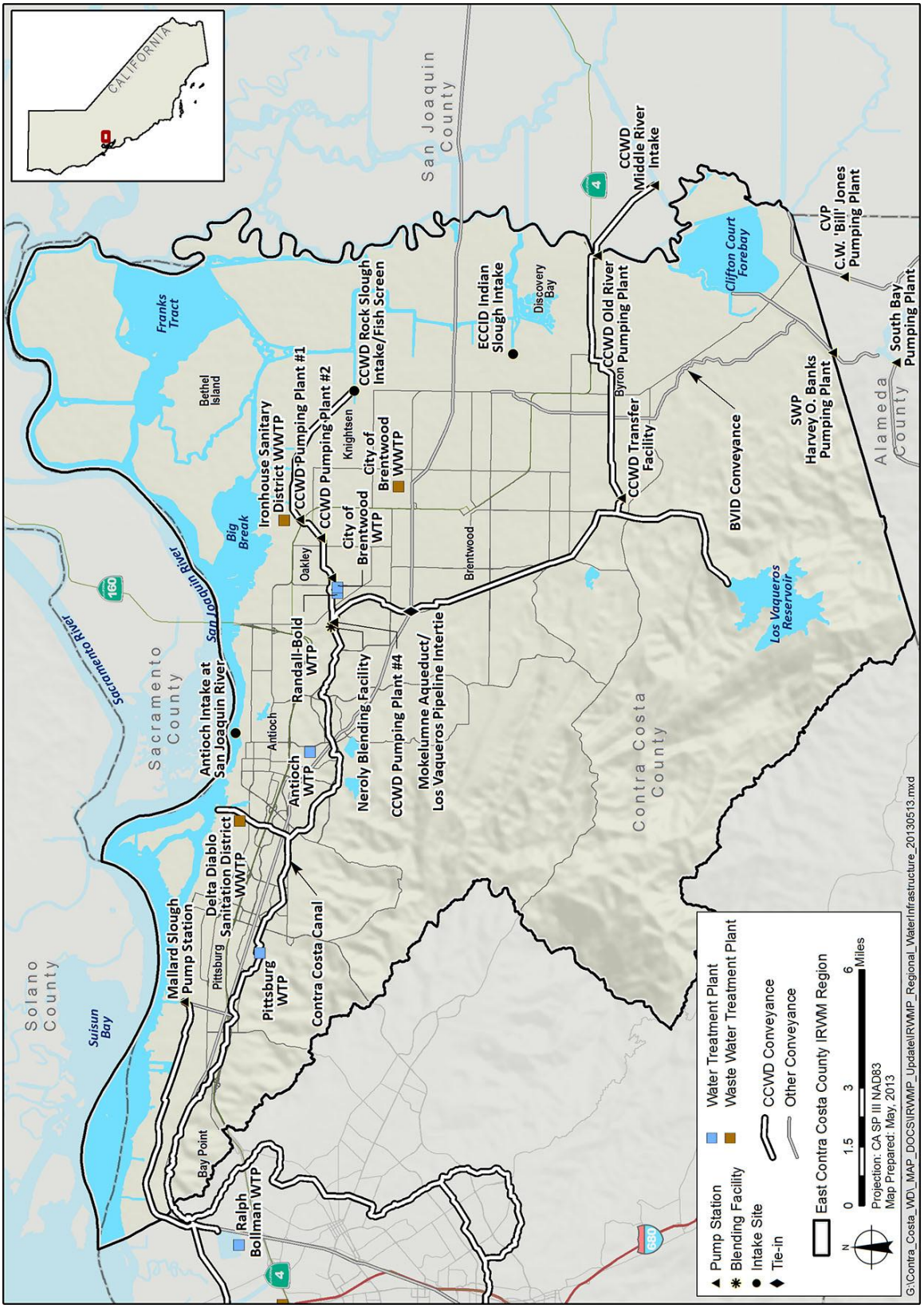


Figure 2-12. Major Water and Wastewater Infrastructure

Antioch Municipal Reservoir

The 735 AF (240 million-gallon) Antioch Municipal Reservoir provides supply reliability and volume for equalization storage for water pumped from the Canal. The reservoir also serves the secondary purposes of flood control and impoundment of local runoff. Water production from the small (1,300-acre) tributary watershed, however, is of negligible importance, particularly since most stormwater runoff from residential areas (about 600 acres) is now diverted around the reservoir.

Preserve System for ECCC HCP/NCCP

More than 9,000 acres have been acquired since 2008 for the Preserve System to fulfill conservation requirements of the HCP/NCCP. These lands were acquired by the East Bay Regional Park District in partnership with the ECCC Habitat Conservancy. Natural resources on these properties will be restored, enhanced, and managed in perpetuity. When acquisition is complete, the Preserve System is anticipated to consist of 24,000 to 30,000 acres. It will build on approximately 45,000 acres of existing public watershed and park land. The Preserve System will protect water bodies and hydrological processes in nearly every major watershed in ECCC. Within the approximately 9,000 acres acquired to date, approximately 215,000 linear feet (40 miles) of streams and 85 acres of wetlands and ponds are managed to protect and enhance natural functions and values.

Major Flood Management Infrastructure

The CCCFCWCD manages most of the major flood management infrastructure in ECCC to provide regional flood protection. The facilities it plans and manages are described below. Major flood management infrastructure within the ECCC region is shown on **Figure 2-13.**

Marsh Creek Reservoir, Dry Creek Reservoir, and Deer Creek Reservoirs

The Marsh Creek Reservoir is located approximately 4 miles southwest of Brentwood. It and the smaller Dry and Deer reservoirs were built in early 1960s with funding from the Soil Conservation Service (now NRCS) to protect the then predominantly agricultural land uses in ECCC from a 5-year storm. The CCCFCWCD manages these facilities and has planned and built a number of other large, regional detention basins in the watershed to increase system capacity and protect rapidly urbanizing area from a 100-year storm. Sediments in the Marsh Creek Reservoir contain elemental mercury washed down from an old mine in the upper watershed.

Marsh Creek Flood Control Channel, Dry Creek Flood Control Channel, Sand Creek Flood Control, and Deer Creek Flood Control Channel

Approximately 12 miles of Marsh Creek, Deer Creek, Dry Creek, and Sand Creek were widened and channelized as part of the 1960s Soil Conservation District flood control project. Other channel capacity work has been planned and constructed by the CCCFCWCD to improve the level of flood protection in the Marsh CreekWatershed.

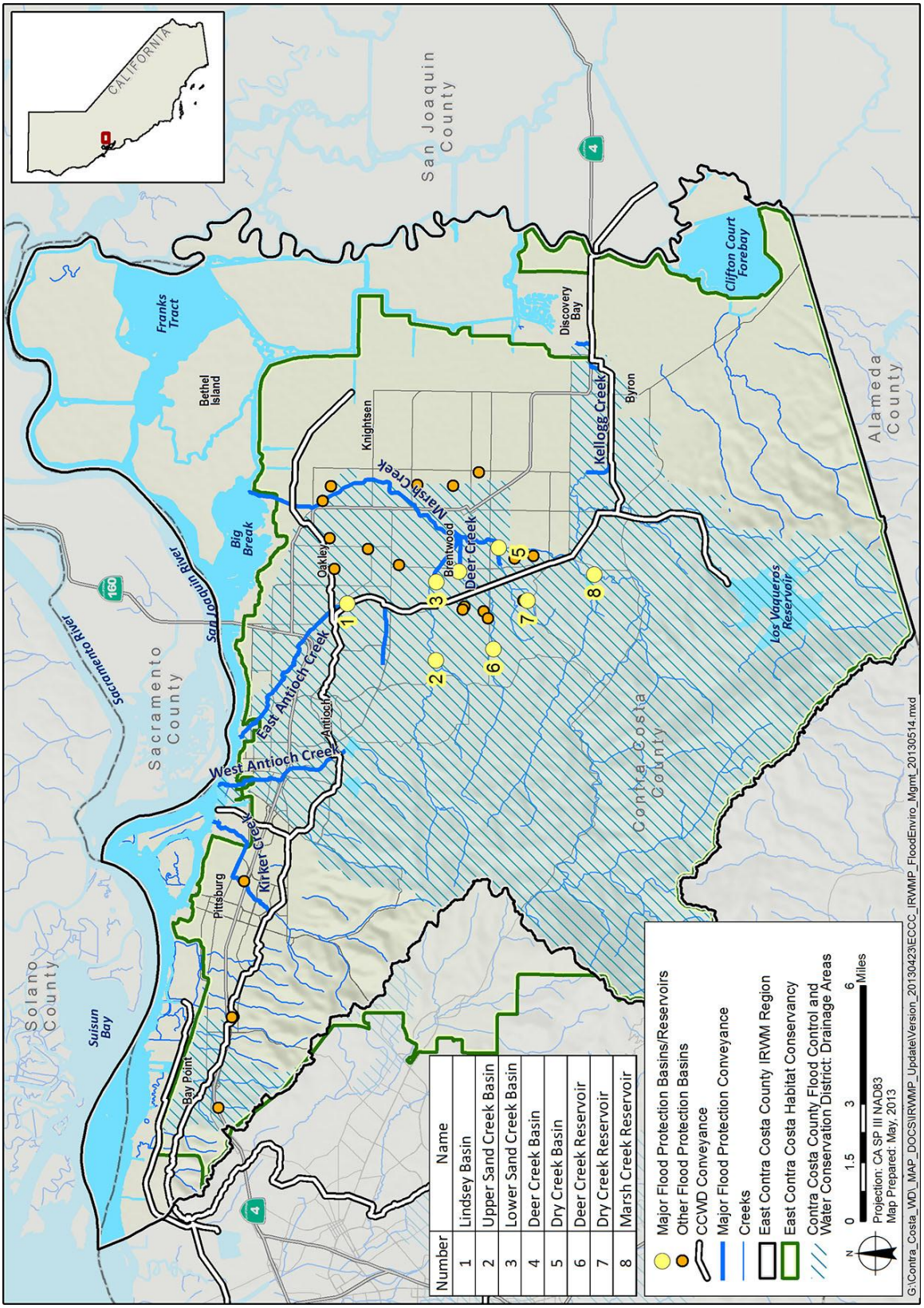


Figure 2-13. Major Flood Management Infrastructure

Drainage Area Infrastructure

The CCCFCWCD established DAs to plan subregional drainage infrastructure and collect development fees to fund subregional drainage infrastructure. The DAs infrastructure is either built by the CCCFCWCD or by developers who then receive credit for their fees or enter a reimbursement agreement to be reimbursed for costs of constructing the infrastructure that are in excess of their fees. Once constructed, most of these facilities are turned over to the local jurisdiction for ownership and maintenance. Some of the major DAs facilities are owned and maintained by the CCCFCWCD using property tax revenues it receives in the Marsh Creek Watershed, also known as Flood Control Zone 1.

East Antioch Creek

East Antioch Creek improvements and their associated basins, (Lindsey Basin and Oakley Basin), are major flood management infrastructure that serve the City of Antioch. Currently, the system is partially owned and managed by the City of Antioch, and the remainder of the improvements will be handed over to the City for ownership and maintenance in the near future.

West Antioch Creek

West Antioch Creek is also a DA funded facility with improvements in various stages of completion, design, and planning. Facilities in this watershed are owned and managed by the City of Antioch.

Major Wastewater Infrastructure

The major wastewater agencies in the region (servings greater than 5,000 customers) include DDSD, ISD, and Brentwood. Their respective WWTP locations are shown in **Figure 2-13**. Below are summary descriptions of their systems.

Delta Diablo Sanitation District

DDSD provides wastewater collection services for the unincorporated community of Bay Point, and conveyance, treatment, and disposal services for Bay Point and the Cities of Antioch and Pittsburg. Since 2001, DDSD has provided recycled water to the Delta Energy Center and the Los Medanos Energy Center (LMEC), and has expanded recycled water conveyance to Pittsburg and Antioch for irrigation of local public parks and median landscapes. The DDSD has been producing and delivering recycled water for cooling tower use at two Calpine power plants since 2001. The Delta Energy Center (DEC) and the Los Medanos Energy Center (LMEC) together use an average of 6.5 MGD (7 TAF per year) of recycled water, resulting in one of the largest industrial uses of recycled water in California. In 2012 these two centers used a combined 8,132 AF of recycled water and have an average annual demand of 7,010 AFY.

The existing DDSD wastewater infrastructure includes conveyance systems, pumping stations, equalization basins, and a WWTP and RWF located on the Pittsburg-Antioch border. Treated wastewater is discharged in New York Slough through a deep water outfall. The WWTP has a permitted capacity of 16.5 MGD; the average dry weather flows (ADWF) for 2012 was 12.7 MGD.

Ironhouse Sanitary District

The ISD provides sewage collection, treatment, and disposal services to the City of Oakley, the unincorporated area of Bethel Island, and other unincorporated areas. ISD's infrastructure includes gravity and pressure pipelines, pumping stations, and the Ironhouse WWTP. Effluent

from the WWTP is discharged to agricultural lands on Jersey Island and into the San Joaquin River. ISD recently constructed a new Ironhouse IWWTP with an initial capacity of 4.3 MGD and an ultimate capacity of 6.8 MGD. ISD participated in a regional water recycling study looking at providing recycled water to industry outside of the ISD service area. ISD completed a Recycled Water Master Plan and is in the process of completing a Recycled Water Feasibility Study looking at potential users of recycled water within the ISD service area and the economic feasibility of developing a separate nonpotable water system that could supply recycled water to offsite users. ISD is currently applying all of its treated effluent to nearby farming operations.

Brentwood

The City of Brentwood owns and operates its wastewater collection, treatment, and disposal system. The collection system, with approximately 138 miles of sewer main, conveys wastewater to the Brentwood Wastewater Treatment Plant (BWWTP) located on approximately 70 acres on the north side of the city adjacent to Marsh Creek. The BWWTP provides tertiary treatment and has an average dry weather flow capacity of 5.0 MGD. Effluent is pumped through the BWWTP as process water and discharged into Marsh Creek. Ultimately, the City of Brentwood is looking to pump this effluent off site as recycled water to be used for irrigation for landscaped areas in accordance with the City's Master Reclamation Permit issued by the Central Valley Water Board. Any remaining treated wastewater is discharged into Marsh Creek per the terms of the City's Waste Discharge Requirements Permit.

2.7. Water Supplies and Demands

Water management in the region is driven by a highly diverse population base with a wide range of water needs, including urban and agricultural uses; major industrial activities; recreation; and environmental systems. Water demand for these uses is met primarily by water supplies from the Delta. Detailed descriptions of water demands and supplies are provided below.

2.7.1. Current and Projected Water Demands

According to the Interim Population Projections for California and its Counties 2010–2050 (California Department of Finance, 2012), the Contra Costa County 2010 population is projected to increase by 20 percent by 2030 and by 42 percent by 2050. With that growth, water demands are also expected to increase. **Figure 2-14** presents population projections for the region's urban areas from 2010 through 2035, as contained in recently completed UWMPs. The ECCC region urban population is projected to increase 38 percent by 2035 from 294,000 people in 2010 to 406,000 people in 2035.

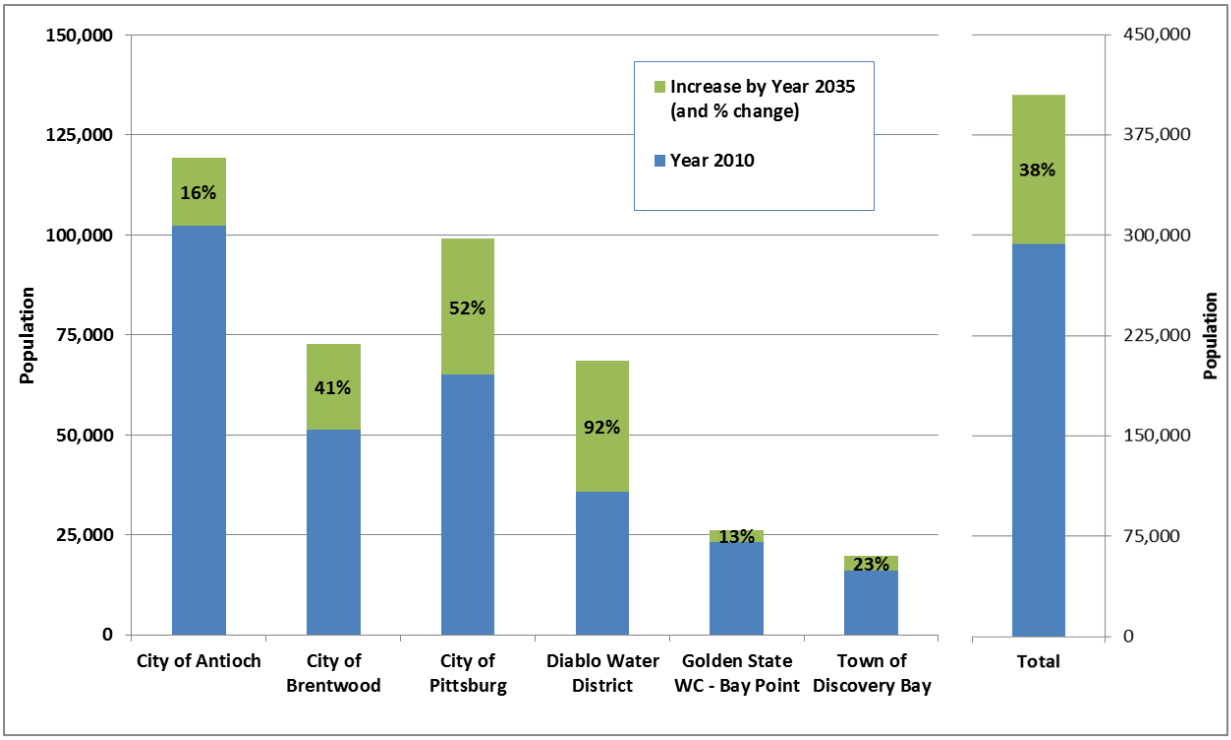
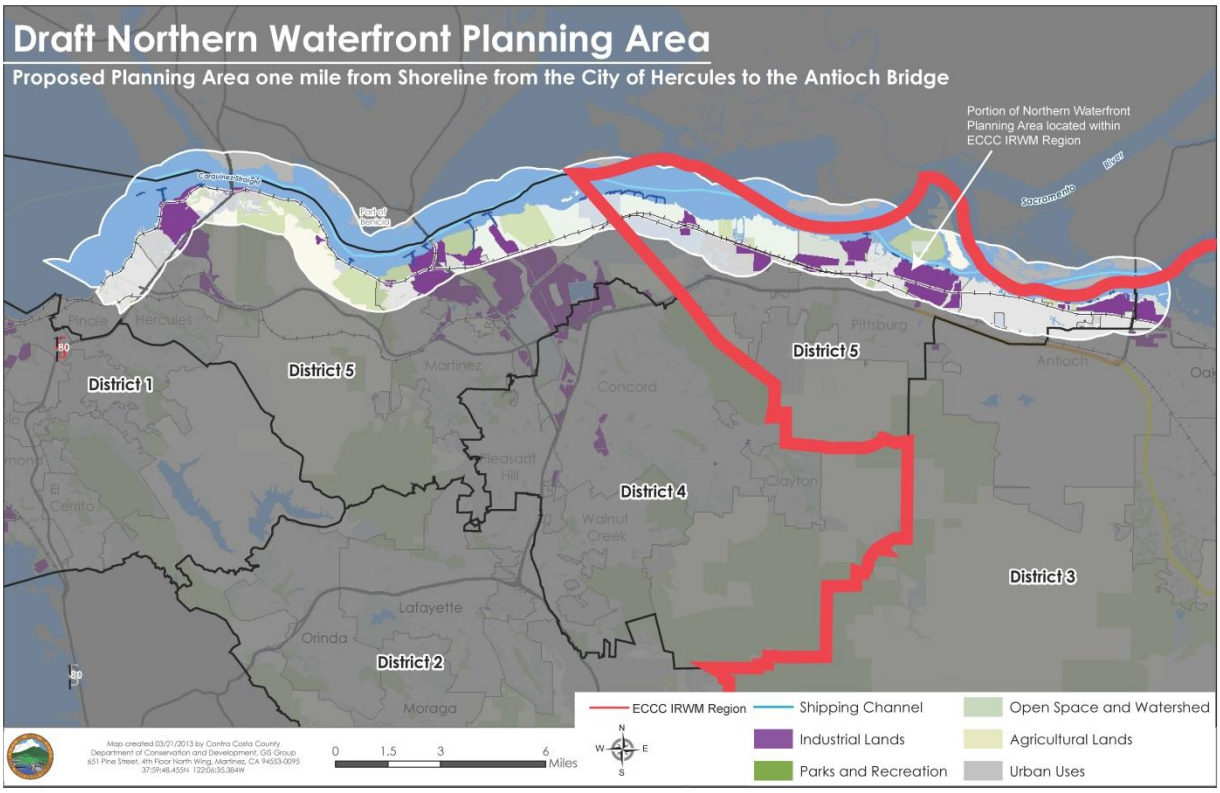


Figure 2-14. Current and Projected 2035 Population for Urban Areas in the Region

Contra Costa County is developing an inventory of industries and large businesses for the northern waterfront extending from Hercules to Antioch. This inventory is supporting a broader effort by the County to develop a strategic plan, to be completed by the end of 2013, for future northern waterfront economic development. A preliminary inventory is shown in **Figure 2-15**. A concentration of industrial lands is located in the ECCC region in the vicinity of Pittsburg and Antioch. Water needs are met by supplies from local municipalities (Cities of Pittsburg and Antioch) and also by recycled water (DDSD). This is discussed below.

Agriculture in Bay Area counties has declined in recent years. Some changes are a result of changing market conditions, and some are a result of suburban growth like that described above. Cropland acreage in Contra Costa County alone has declined approximately 19 percent between 1990 and 2008 according to a 2011 report led by the American Farmland Trust.[5] Present cropland acreage for the county is approximately 23,000 acres (irrigated and nonirrigated). The American Farmland Trust reports that there are over 275 irrigated farms in Contra Costa County and most are in eastern Contra Costa County.[5] A majority of this acreage is located within BBID and ECCID. BBID and ECCID reported 5,663 and 7,071 irrigated cropland acreage respectively for 2012. This is a total 12,734 irrigated acres in 2012.

[5] Sustaining Our Agricultural Bounty–A White Paper, American Farmland Trust, Greenbelt Alliance, and Sustainable Agriculture Education, March 2011.



Source: Contra Costa County Community Development, 2013 Northern Waterfront Economic Development Initiative

Figure 2-15. Preliminary Inventory of Industry and Large Businesses, Northern Waterfront

Table 2-5 and **Figure 2-16** show current and projected water demands for urban, industrial, and agricultural water uses in the region. Urban demands within the region are met by public and private water utilities. The urban demand in these areas is expected to increase from 49 TAF per year in 2010 to 73 TAF per year in 2035. The use of recycled water and air-cooled condensers for power facilities in the region is significant since the Pacific Gas and Electric Company (PG&E) Pittsburg and Antioch power plants along the San Joaquin River had been using once-through cooling water from the Delta. The NRG Pittsburg plant is the only remaining power generating facility within Pittsburg and Antioch that continues to use once-through cooling. Using recycled water for cooling towers lessens environmental impacts from entraining and impinging sensitive aquatic species associated with once through cooling systems as well as lowers the heat input into the Delta from the discharge of power plant cooling water.

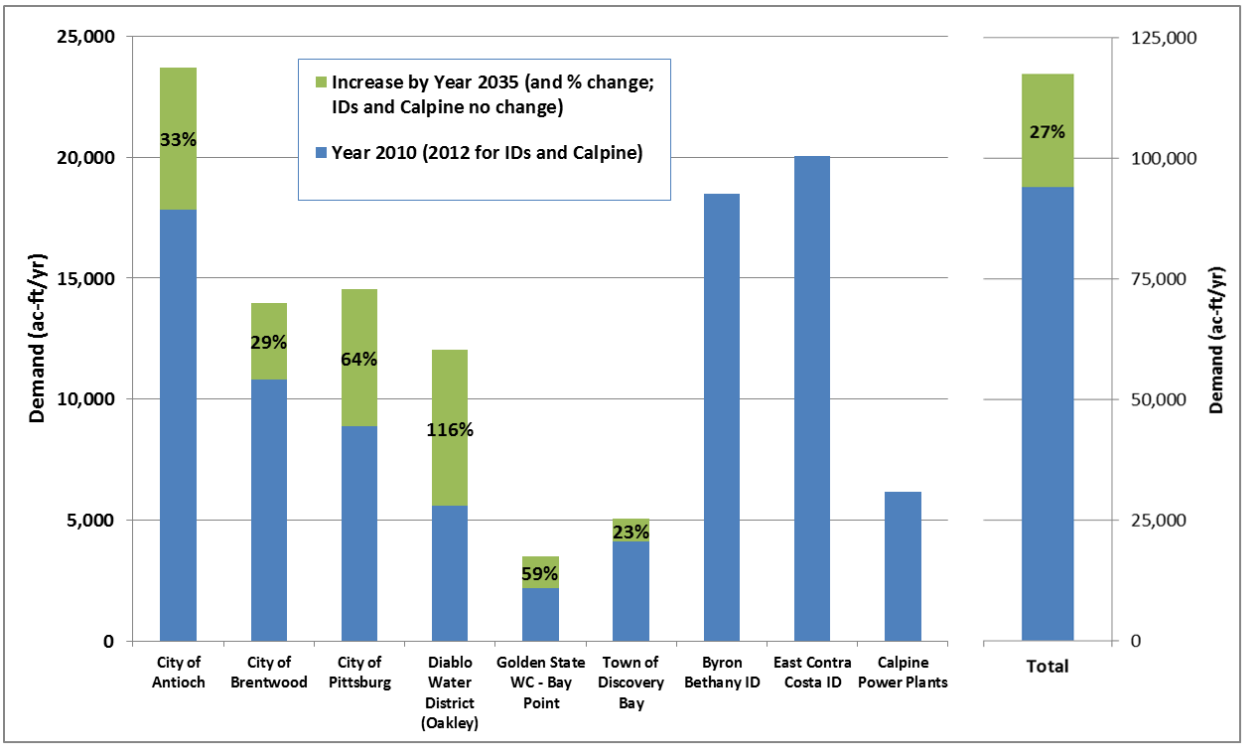
Most of the agricultural demands in the region are met by irrigation district supplies (BBID and ECCCID). A small percentage of agricultural demand is for small-scale farm operations that rely upon privately owned wells or individual surface water rights. While other special districts may have powers that allow for distribution of water, such as BIMID, they are not exercised. Agricultural water use reported by BBID and ECCID was about 38 TAF in 2012. (This does not account for agricultural water use by small private farms located outside these districts. Data for these uses is not available on a regional scale.) Estimates of projected agricultural water use for the region are not available. Recent trends suggest future agricultural water use would be similar.

Table 2-5. Current/Projected Urban, Industrial[d], and Agricultural Water Demands (AFY)

Major Water Retailer	2010	2015	2020	2025	2030	2035	Change (2010 to 2035)	Increase by Year 2035
City of Antioch[a]	17,843	22,677	21,301	22,400	23,049	23,717	33%	5,874
City of Brentwood[a]	10,802	11,563	11,520	12,658	13,333	13,981	29%	3,179
City of Pittsburg[a]	8,876	10,788	11,622	12,520	13,487	14,531	64%	5,655
Diablo Water District (Oakley)[a,b]	5,573	7,847	8,578	9,728	10,882	12,036	116%	6,463
Golden State WC - Bay Point[a]	2,190	2,955	3,139	3,298	3,376	3,474	59%	1,284
Town of Discovery Bay[a,c]	4,097	4,569	5,041	5,041	5,041	5,041	23%	944
Subtotal	**49,381**	**60,399**	**61,200**	**65,645**	**69,168**	**72,780**	**47%**	**23,399**
Calpine Power Plants[d]	6,160	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Subtotal	**6,160**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
Byron Bethany ID[e]	18,484	n/a	n/a	n/a	n/a	n/a	n/a	n/a
East Contra Costa ID[f]	20,038	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Subtotal	**38,522**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
Total	**94,063**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**

Notes:
[a] 2010 demand from Urban Water Management Plans.
[b] Includes the City of Oakley, and areas served outside the City of Oakley which includes portions of Knightsen and Bethel Island.
[c] Water Master Plan (from 2012) projects build-out conditions will be reached in 10 years (about 2020).
[d] Calpine Power Plan average annual demand is 7,010 AFY. Projected demands will be provided in the next IRWMP update following DDSD's completion of its Recycled Water Master Plan.
[e] 2012 demand based on District Crop Production Report of 2012 irrigation, Byron Bethany Irrigation District.
[f] 2012 demand based on District Crop Production Report of 2012 irrigation, East Contra Costa Irrigation District.
Key:
AFY = acre-foot per year
ID = Irrigation District
WC = Water Company
n/a = data not available

The ECCC region includes a richly diverse environmental landscape, including grassland, oak woodland, chaparral, streams, and wetlands. Each of these environmental systems has specific water requirements for the maintenance of the ecosystem and its dependent species. A majority of the environmental water requirement is associated with river- and wetland-dependent aquatic ecosystems, and is often referred to as environmental flow requirements or habitat conservation requirements. These flow requirements can be defined by magnitude, timing, frequency, duration, or some combination of those factors. CCWD provides up to 5 cubic feet per second to Kellogg Creek downstream from the Los Vaqueros Reservoir dam. The City of Brentwood discharges treated effluent to Marsh Creek estimated to be approximately 5,000 TAF per year.



Source: 2010 Urban Water Management Plans, 2012 District Crop Reports, and 2012 DDSD recycled water use records.

Figure 2-16. Current and Projected 2035 Water Demands

2.7.2. Current and Projected Water Supplies

Water supplies for urban and industrial uses originate from surface water purchased from CCWD and, to a lesser extent, recycled water, groundwater, and local surface water supplies. This pattern is expected to continue. Agricultural water needs are met mostly by surface water supplied by BBID, ECCID, and individual water rights for small farm operations. Some small farm operations use groundwater from privately owned wells. ECCID also uses groundwater when demand exceeds their surface water supply. Detailed descriptions of both existing and projected water supplies are provided below.

Existing water supplies are summarized based on 2010 UWMPs, irrigation district irrigated crop reports, and other agency records. **Table 2-6** summarizes water supply by specific source for municipal agencies, irrigation district, and large industry in the region. On average, surface water provides approximately 78.2 percent of existing water supplies in the region. Groundwater and recycled water supply approximately 9.4 percent and 12.4 percent of total water supplies, respectively.

Table 2-6. Current Water Supply Availability by Source (AFY)

	City of Antioch	City of Brentwood	City of Pittsburg	Diablo Water District (Oakley)	Golden State WC - Bay Point	Town of Discovery Bay	Delta Diablo Sanitation District (for industry)	Ironhouse Sanitary District (for pasture)	Byron Bethany ID (for irrigated crops)	East Contra Costa ID (for irrigated crops)	Small Private Farms (for irrigated crops)	Total
Sacramento/San Joaquin Rivers, Delta - Purchased from CCWD	22,677		7,815	8,402	1,954							40,848
Sacramento/San Joaquin Rivers, Delta - Purchased from ECCID		8,175										8,175
Sacramento/San Joaquin Rivers, Delta - Water Right	7,550								18,500	20,000	unk	46,050
Local Municipal Reservoir	380											380
Groundwater		3,535	1,500	2,062	235	4,097					unk	11,429
Recycled Water			459				12,000	2,700				15,159
Total	30,607	11,710	9,774	10,464	2,189	4,097	12,000	2,700	18,500	20,000	unk	122,041

Tables 2-7 and **2-8** present the current and projected water supplies for urban, industry, and agriculture in the region. Water supplies are categorized by source to distinguish surface water from groundwater from recycled water. **Table 2-7** represents normal (average hydrology) conditions. The region's supplies originating from the Delta are subject to variable hydrologic conditions, which can significantly reduce the availability of this supply. **Table 2-8** represents what water supplies would be under dry hydrologic conditions. Comparing water supplies under normal and dry hydrologic conditions helps identify potential water supply shortfalls. Under dry year hydrologic conditions, reductions in total surface water supplies to the region are projected to be less than 2,000 TAF per year. However, this is subject to change, depending upon future decisions that may affect how the Delta is managed that in turn may impact, positively or negatively, the availability and quality of water provided to the region from the Delta.

Figures 2-17a and 2-17b illustrate the relative portions of surface water, groundwater, and recycled water for each municipal agency for current (2010) and projected (2030) normal conditions. This illustration reaffirms that, with the exception of Discovery Bay, all urban areas within the region are heavily dependent upon surface water from the Delta.

Table 2-7. Projected Urban, Industrial, and Agricultural Water Supplies in a Normal Year

Source	Projected Supplies (Thousand AFY)				
	2010	2015	2020	2025	2030
Normal Year					
Surface Water	**95.5**	**98.2**	**103.4**	**106.4**	**111.4**
City of Antioch (CCWD/River)	30.6	30.6	29.2	30.3	31.0
City of Brentwood (CCWD/ECCID)	8.2	8.8	8.7	9.6	10.1
Diablo Water District – Oakley (CCWD)	8.4	8.4	14.0	14.0	16.8
City of Pittsburg (CCWD)	7.8	9.2	10.1	11.0	11.9
Golden State Water Co Bay Point (CCWD)	2.0	2.7	2.9	3.0	3.1
Byron Bethany ID (River water right)	18.5	18.5	18.5	18.5	18.5
East Contra Costa ID (River water right)	20.0	20.0	20.0	20.0	20.0
Small Private Farms (River water right)	unknown	unknown	unknown	unknown	unknown
Recycled Water (1)	**15.2**	**15.853**	**16.15**	**16.8**	**17.7**
City of Antioch (DDSD)	0.0	0.5	0.6	0.8	0.8
City of Brentwood	0.0	0.053	0.25	0.5	1.4
City of Pittsburg (DDSD)	0.5	0.6	0.6	0.8	0.8
Delta Diablo Sanitation District (industrial)	12.0	12.0	12.0	12.0	12.0
Ironhouse Sanitary District (pasture)	2.7	2.7	2.7	2.7	2.7
Groundwater	**11.3**	**12.3**	**13.4**	**13.7**	**14.8**
City of Brentwood	3.5	3.8	3.8	4.1	4.4
Diablo Water District – Oakley	2.1	2.1	2.8	2.8	3.6
City of Pittsburg	1.5	1.5	1.5	1.5	1.5
Golden State Water Co Bay Point	0.2	0.3	0.3	0.3	0.3
Town of Discovery Bay	4.0	4.6	5.0	5.0	5.0
East Contra Costa ID (district wells)	unknown	unknown	unknown	unknown	Unknown
Small Private Farms (private wells)	unknown	unknown	unknown	unknown	Unknown
Total Supplies	**122**	**126.353**	**132.95**	**136.9**	**143.9**
City of Antioch	30.6	31.1	29.8	31.1	31.8
City of Brentwood	11.7	12.653	12.75	14.2	15.9
Diablo Water District – Oakley	10.5	10.5	16.8	16.8	20.4
City of Pittsburg	9.8	11.3	12.2	13.3	14.2
Golden State Water Co Bay Point	2.2	3	3.2	3.3	3.4
Town of Discovery Bay	4	4.6	5	5	5
Delta Diablo Sanitation District (industrial)	12	12	12	12	12
Ironhouse Sanitary District (pasture)	2.7	2.7	2.7	2.7	2.7
Byron Bethany ID	18.5	18.5	18.5	18.5	18.5
East Contra Costa ID	20.0	20.0	20.0	20.0	20.0
Small Private Farms	unknown	unknown	unknown	unknown	unknown

Source: Urban supplies from 2010 Urban Water Management Plans; Irrigation district supplies from 2012 Crop Reports,

Note:

(1) DDSD supplies recycled water to the Cities of Pittsburg and Antioch as well as the power generating facilities within Pittsburg. Ironhouse Sanitary District uses recycled water for irrigating row crops. Presently, Brentwood discharges its tertiary treated water into Marsh Creek. Over time, Brentwood expects to reduce the discharge of treated water into Marsh Creek and instead use these supplies to water parks, golf courses, schools playfields, landscape areas etc.

Key:

AFY = acre-feet per year

CCWD = Contra Costa Water District

DDSD = Delta Diablo Sanitation District

ECCID = East Contra Costa Irrigation District

ID = Irrigation District

Table 2-8. Projected Urban, Industrial, and Agricultural Water Supplies in a Dry Year

Source	Projected Supplies (Thousand AFY)				
	2010	2015	2020	2025	2030
Dry Year					
Surface Water	**93.5**	**98.2**	**103.4**	**105.8**	**109.2**
City of Antioch (CCWD/River)	28.6	30.6	29.2	30.1	30.1
City of Brentwood (CCWD/ECCID)	8.2	8.8	8.7	9.6	10.1
Diablo Water District – Oakley (CCWD)	8.4	8.4	14.0	13.9	16.1
City of Pittsburg (CCWD)	7.8	9.2	10.1	10.8	11.4
Golden State Water Co Bay Point (CCWD)	2.0	2.7	2.9	2.9	3.0
Byron Bethany ID (River water right)	18.5	18.5	18.5	18.5	18.5
East Contra Costa ID (River water right)	20.0	20.0	20.0	20.0	20.0
Small Private Farms (River water right)	unknown	unknown	unknown	unknown	unknown
Recycled Water(1)	**15.2**	**15.853**	**16.15**	**16.8**	**17.7**
City of Antioch (DDSD)	0.0	0.5	0.6	0.8	0.8
City of Brentwood	0.0	0.053	0.25	0.5	1.4
City of Pittsburg (DDSD)	0.5	0.6	0.6	0.8	0.8
DDSD	12.0	12.0	12.0	12.0	12.0
Ironhouse Sanitary District	2.7	2.7	2.7	2.7	2.7
Groundwater	**11.3**	**12.3**	**13.4**	**13.7**	**14.8**
City of Brentwood	3.5	3.8	3.8	4.1	4.4
Diablo Water District – Oakley	2.1	2.1	2.8	2.8	3.6
City of Pittsburg	1.5	1.5	1.5	1.5	1.5
Golden State Water Co Bay Point	0.2	0.3	0.3	0.3	0.3
Town of Discovery Bay	4.0	4.6	5.0	5.0	5.0
East Contra Costa ID (district wells)	unknown	unknown	unknown	unknown	Unknown
Small Private Farms (private wells)	unknown	unknown	unknown	unknown	Unknown
Total Supplies	**120**	**126.353**	**132.95**	**136.3**	**141.7**
City of Antioch	28.6	31.1	29.8	30.9	30.9
City of Brentwood	11.7	12.653	12.75	14.2	15.9
Diablo Water District – Oakley	10.5	10.5	16.8	16.7	19.7
City of Pittsburg	9.8	11.3	12.2	13.1	13.7
Golden State Water Co Bay Point	2.2	3	3.2	3.2	3.3
Town of Discovery Bay	4	4.6	5	5	5
DDSD	12	12	12	12	12
Ironhouse Sanitary District	2.7	2.7	2.7	2.7	2.7
Byron Bethany ID	18.5	18.5	18.5	18.5	18.5
East Contra Costa ID	20	20	20	20	20.0
Small Private Farms	unknown	unknown	unknown	unknown	unknown

Source: Urban supplies from 2010 Urban Water Management Plans; Irrigation district supplies from 2012 Crop Reports.

Note:

(1) DDSD supplies recycled water to the Cities of Pittsburg and Antioch as well as the power generating facilities within Pittsburg. Ironhouse Sanitary District uses recycled water for irrigating row crops. Presently, Brentwood discharges its tertiary treated water into Marsh Creek. Over time, Brentwood expects to reduce the discharge of treated water into Marsh Creek and instead use these supplies to water parks, golf courses, schools playfields, landscape areas etc.

Key:
AFY = acre-feet per year
CCWD = Contra Costa Water District
DDSD = Delta Diablo Sanitation District
ECCID = East Contra Costa Irrigation District
ID = Irrigation District

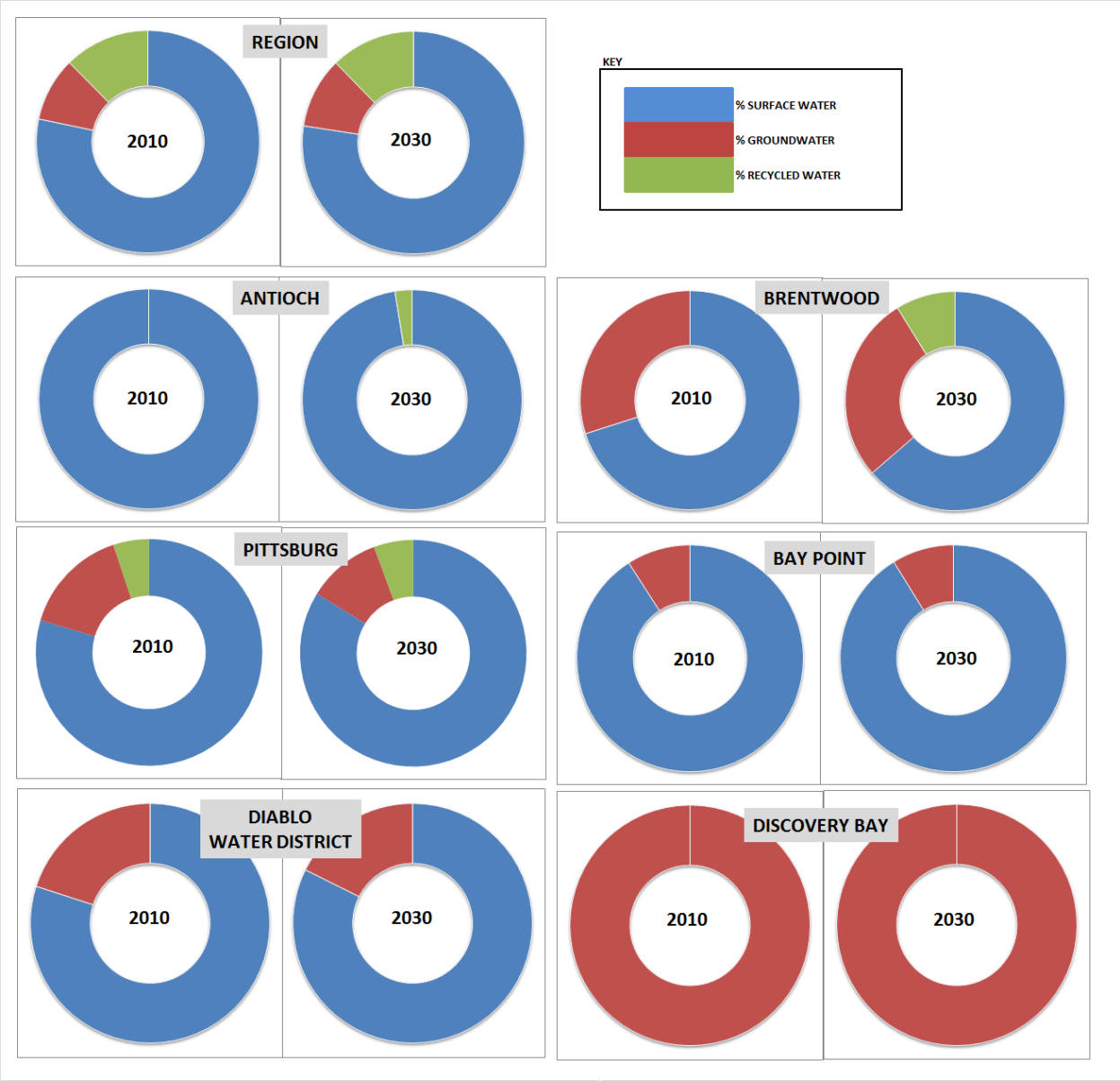


Figure 2-17a. Normal Year and Projected 2030 Sources of Water Supply

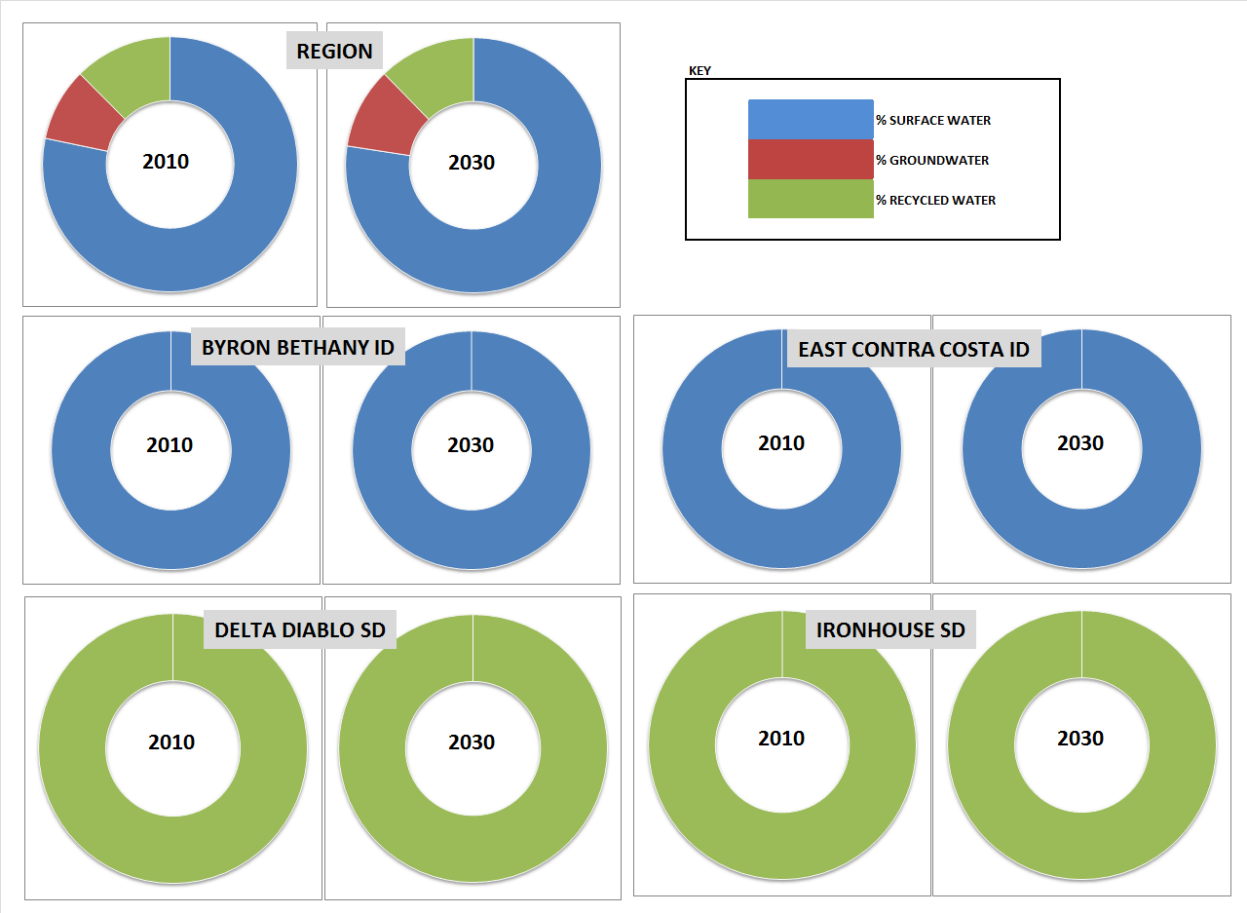


Figure 2-17b. Normal Year and Projected 2030 Sources of Water Supply

2.7.3. Comparison of Water Supplies and Demands

Figures 2-18 and **2-19** compare the projected demands and supplies out to year 2030 for normal and dry year conditions, respectively. Projected industrial and agricultural demands are not available and for purposes of this analysis, projections were assumed equal to 2012 demands.

As shown in these figures, water supplies appear to be sufficient to meet urban, industrial, and agricultural needs on an annual basis under both normal and dry year conditions. This condition affords the region other opportunities. In late 2012, the retail urban water suppliers of the region, along with the City of Martinez and water wholesaler CCWD, began developing a Regional Capacity Study to look at strategies and projects to optimize the region's water supplies, facilities, and operations. Resulting outcomes of this study will be incorporated in the future updates of the IRWM Plan.

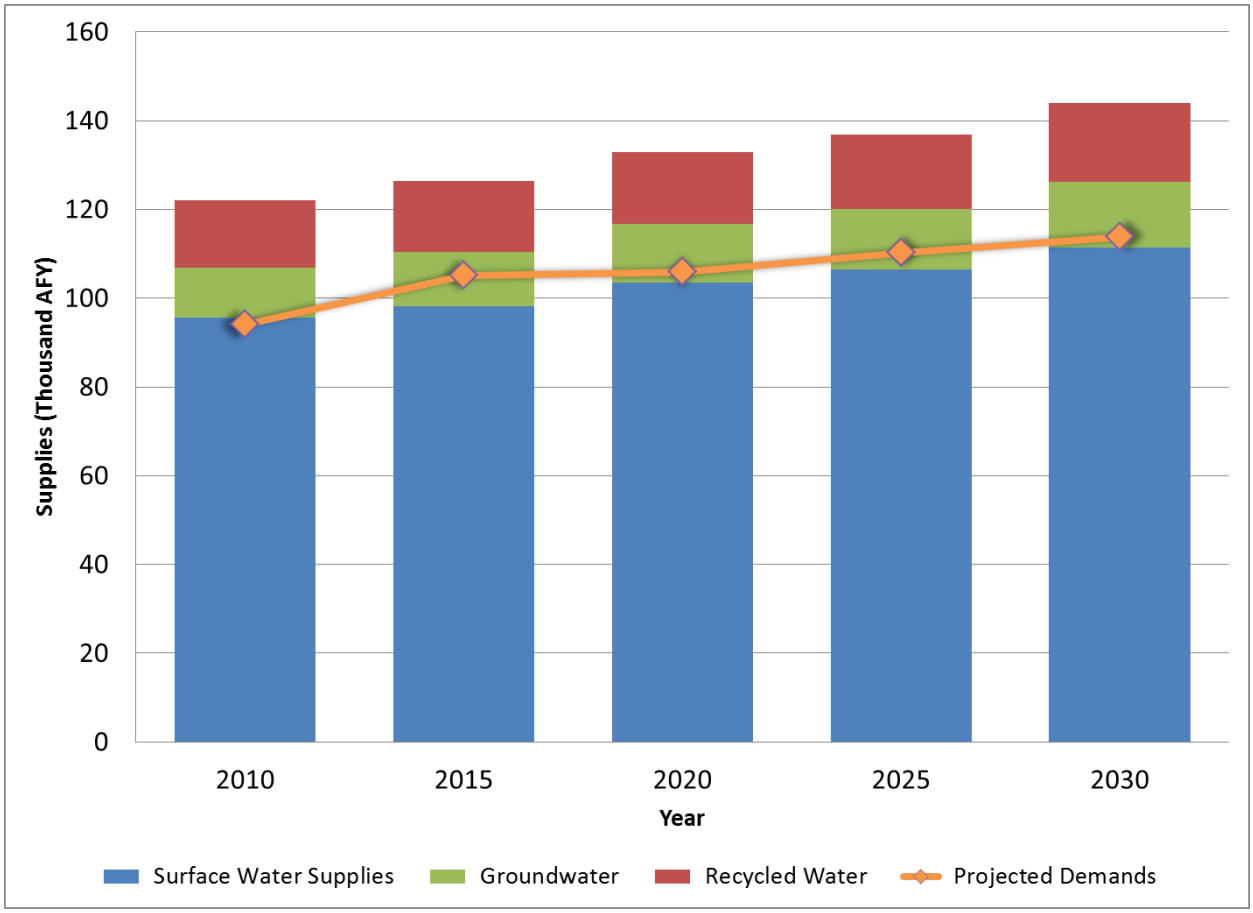


Figure 2-18. Normal Year Projected Supply and Demand in the Region

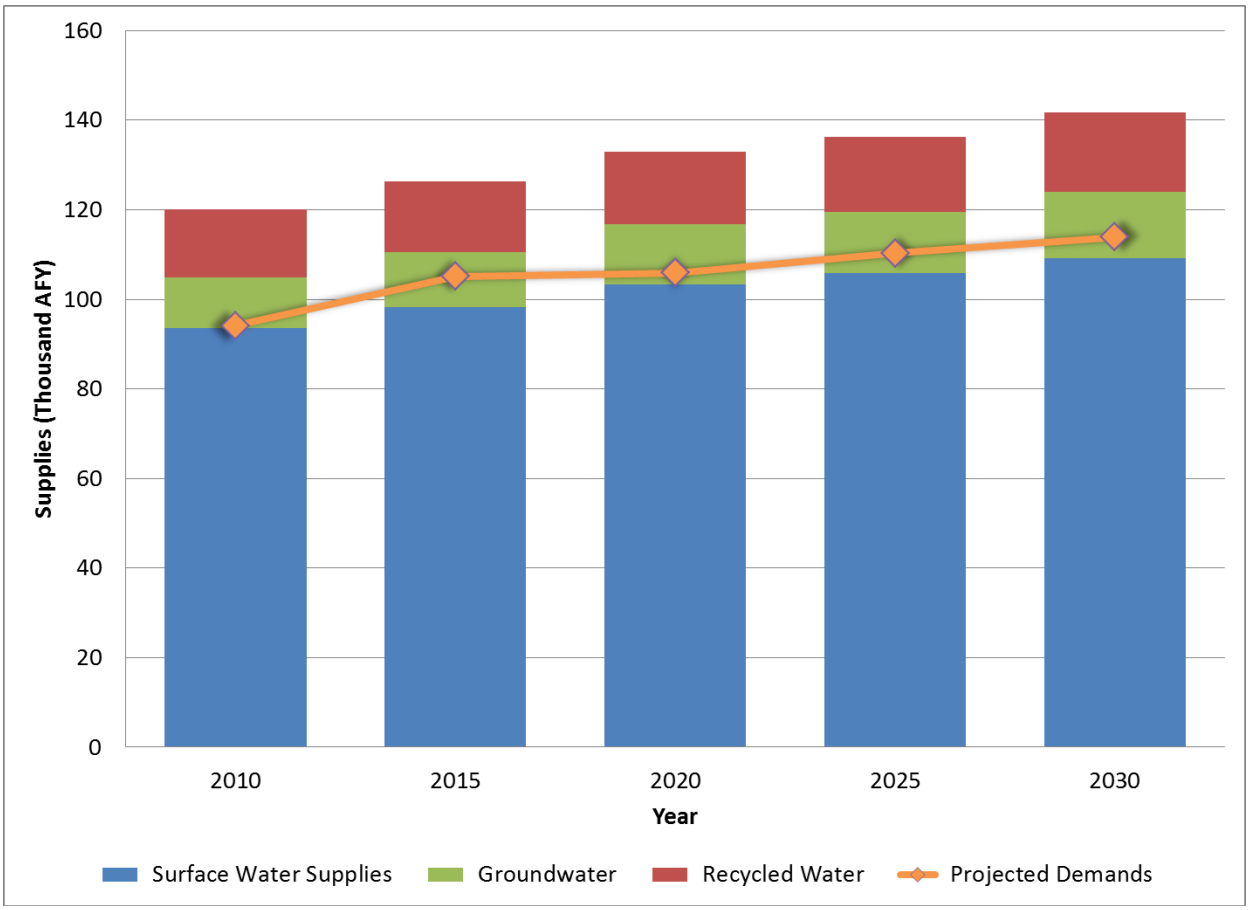


Figure 2-19. Dry Year Projected Supply and Demand in the Region

2.8. Climate Change Vulnerability Assessment

Over the coming decades, California's Bay-Delta system will feel impacts of global climate change with shifts in biological communities, a rising sea level, and modified water supplies, Together, the San Francisco Bay, San Francisco Watershed, and the Delta form an interconnected and valuable resource system.

Evidence confirms the San Francisco Bay is already rising, this is impacting the Delta, and this is projected to continue. In fact, today's flood is expected to be the future's high tide. Areas that currently flood every 10 to 20 years during extreme weather and tides will begin to flood regularly. The consequences may be severe.

ECCC is composed of substantial low-elevation acreage, is within the drainage of Mount Diablo, and sits adjacent to the Delta; both localized floods from stormwater runoff and regional/catastrophic flooding due to levee failure are real and present threats. Of the past 11 president-declared natural disasters in the region, all but one involved storms and flooding. Climate change is only likely to increase these risks.

The Bay-Delta system is also the primary ECCC water supply. Sea-level rise and extreme weather can impact water quality through introduction of salinity into freshwater supplies,

increased runoff and pollutants entering the system, increased turbidity, and the potential for low-elevation critical infrastructure to be inundated.

Beyond the immediate concerns of managing altered and increased flows, the timing and volume of flows are likely to change due to changing temperature patterns in upper elevations. The entire interconnected State and federal water projects and other systems are designed and operated on basic assumptions about snow pack and predictable weather patterns. This means it is likely that ECCC water supply and water quality will be impacted by both floods and drought and the traditional systems for water delivery will be less reliable.

Deciding how best to meet the multiple (and sometimes conflicting) interests of those who value the resources of the Bay-Delta system already poses challenges to area resource managers. As the climate changes, the intensity of the challenges they face is likely to increase.

Therefore, as resource managers develop strategies to protect the Bay-Delta system–and the critical services it provides–they need to understand how global climate change will affect the system. The ECCC region must also implement adaptation actions that will reduce the vulnerability of the built and natural environment to the effects of climate change.

State and local agencies are already engaged in a number of efforts designed to improve California's ability to cope with a changing climate. IRWM planning efforts are collaborative and include many entities dealing with water management. These aspects make IRWM a good platform for addressing issues like climate change where multiple facets of water management are affected. To this end, DWR developed a standard to ensure that IRWM plans describe, consider, and address the effects of climate change on their regions and disclose, consider, and reduce when possible greenhouse gas (GHG) emissions when developing and implementing projects (DWR, 2010). To provide guidance for implementing the IRWM Climate Change Standard and incorporating climate change analyses into the IRWM planning processes, DWR and its partners USACE, EPA, and Resources Legacy Fund developed the Climate Change Handbook for Regional Water Planning (Handbook) (DWR, 2011).

2.8.1. Handbook Approach

In accordance with the Handbook, vulnerabilities of the region to future climate change impacts were assessed and member agencies described efforts taken to adapt to climate change and to reduce GHG emissions in the region. The approach for assessing climate change in the region involved the following steps:

- Characterize the region
- Review literature on regional climate change impacts
- Assess and prioritize climate change vulnerabilities using the Handbook checklist
- Compile ongoing member agency efforts to address climate vulnerabilities

The full summary of information required for Handbook compliance is contained in **Appendix C**. Highlights of that summary include the following:

Characterize Region

Sections 2.5 through 2.7 of this IRWM Update 2013, characterize the social/cultural makeup and water resources, supplies, and demands of the region.

Review Climate Change Impacts

Multiple studies of climate change impacts on water resources specific to the western United States and California are available. A literature review was conducted to survey existing information and to determine the potential regional impacts of climate change.

Despite predictions for somewhat less overall precipitation over the long term, the region is also predicted to have more extreme storms. The region is also projected to have more frequent, longer, and more extreme heat waves and longer periods of drought.

Mean sea level is expected to rise by approximately 12.3 to 60.8 centimeters by the year 2050 at the Golden Gate Bridge (NRC, 2012). The Delta in the northern portion of the ECCC region is tidally influenced, and would be affected by rising sea levels.

These predicted climatic shifts would have an impact on the region's water supply, water demand, flooding, water quality, ecosystems and habitats, and hydropower.

Identify and Prioritize Key Regional Areas of Potential Vulnerability

The next step was to identify and prioritize areas of potential vulnerability to climate change impacts. This allows the region to better plan adaptation actions to target specific high-priority climate vulnerabilities in the region.

Defined by the Intergovernmental Panel on Climate Change (IPCC), vulnerability is a function of the character, magnitude, and rate of climate variation (the climate hazard) to which a system is exposed, as well as of non-climatic characteristics of the system, including its sensitivity, and its coping and adaptive capacity (IPCC, 2001).

The Handbook provides a useful checklist for qualitatively determining areas of potential vulnerability within the region. Indicators of potential vulnerability include currently observable climate impacts, presence of climate sensitive features, and adaptive capacity of regional resources. The complete set of checklist responses can be found in **Appendix D**.

The checklist responses also include indications of the level of priority for each vulnerability. Prioritization was accomplished qualitatively, with issues assigned a low, medium, or high priority based on the potential impacts to the region's water resources, assessed likelihood, and regional values. The highest priority vulnerabilities in the region are related to the Delta. The region is reliant on the Delta for most of its water supply, and the Delta serves as an important habitat for endangered and threatened species. Therefore, changes to seasonal water supplies, water quality, and sea levels represent some of the most critical impacts. All of the vulnerabilities related to the health of the Delta have the highest priority.

Ongoing Member Agency Efforts to Address Climate Vulnerabilities

As part of the IRWM Plan monitoring process, member agencies will report on ongoing efforts to address climate change vulnerabilities. Additional assessment of the primary climate change impacts the IRWM Plan must consider and respond to, follow in Sections 2.9.2 through 2.9.9.

2.8.2. Water Supply

Surface Water

Most of the water suppliers in the ECCC region are dependent on surface water supplies from the Delta to meet the majority of regional demand. CCWD, ECCID, and the City of Antioch maintain surface water intakes in the Delta. DDSD supplies recycled water to industrial, and to a lesser extent, municipal customers in the region. As discussed in Section 2.7, water supply in the Delta is already unreliable and changes in seasonal runoff patterns from climate change are likely to lead to reduced water supply reliability. Changes in precipitation and temperature in the Sierra Nevada region affect the timing and quantity of tributary flows. This affects the availability of fresh surface water for the region. Contributing factors include a reduced Sierra snowpack, earlier snowmelt, and extended drought periods punctuated by intense precipitation events.

Climate change could result in less storage in upstream CVP/SWP reservoirs, which in turn could reduce flows into the Delta during the summer and fall. Although some agencies in the ECCC region are not CVP/SWP contractors and divert from the Delta under their own water right, the availability of high-quality freshwater in the Delta is heavily dependent on the operation of CVP/SWP reservoirs; therefore, surface water supply for the region could be affected by changes in snowpack and upstream reservoir operations.

There is concern from the region's water supply agencies that two of their six water supply intakes could become threatened by climate change-related sea-level rise. The two intakes of concern are CCWD's Mallard Slough intake and the City of Antioch's intake.

Groundwater

Many of the agencies in ECCC rely on groundwater to blend with surface water to augment local water supply. The City of Brentwood, ECCID, DWD, and the City of Pittsburg use groundwater wells to supplement surface supplies and increase reliability. Changes in local hydrology could affect natural recharge to the local groundwater aquifers and the quantity of groundwater that could be pumped sustainably over the long term. Decreased inflow from runoff, increased evaporative losses, and warmer and shorter winter seasons can alter natural recharge of groundwater. Furthermore, potential reductions in surface water availability in the Delta as described above could lead to more reliance on local groundwater.

2.8.3. Water Demand

It is likely that water demand (agricultural, municipal, industrial, recreational, and environmental) in the region will increase as a result of more frequent, longer, and more extreme heat waves; increased air temperatures; increased atmospheric carbon dioxide levels; changes in precipitation, winds, humidity, atmospheric aerosol and ozone levels; and population growth. Increased water demand would put even greater strain on the region's limited water supply. Regional water shortages could occur if the region's supply is not able to keep up with demand, a problem exasperated from both the supply and demand sides by a changing climate.

Much of the region's seasonal pattern of demand is due to higher agricultural and landscaping irrigation demands during the summer months. Warming temperatures and heat waves will likely intensify the need for summer irrigation and exacerbate the seasonal demand differential.

Agricultural water demands include those associated with crop irrigation and livestock consumption, both of which represent important business interests in the region. Changes in temperature along with changes in the atmosphere's composition have the potential to either increase or decrease irrigation water needs. Elevated carbon dioxide levels may increase crop growth as photosynthesis responds positively to extra carbon dioxide. However, this positive response is not sustained because photosynthesis is eventually reduced. Additionally, elevated carbon dioxide levels also generally cause stomata to close (Baldocci and Wong, 2006); this effect leads to water savings by reducing transpiration at the leaf scale. At the field scale, however, these savings become much less significant and larger crops growing in a warmer climate are expected to use more water (Reclamation, 2011).

2.8.4. Flooding

ECCC is especially vulnerable to flooding due to levee overtopping or failure. Much of the infrastructure in the region is at or below mean sea level, while land protected by independently maintained levees are at risk for increased levee failure and flood damage. Failures could lead to disruption or changes in water supply reliability, water treatment, and wastewater treatment and disposal. CCWD, ECCID, and the City of Antioch have water intake facilities that could be at risk if sea level increases significantly. Similarly, some wastewater treatment plant (DDSD and ISD's) facilities are located in regions that could be at risk of flooding given sea-level rise.

In recent decades, the mean sea level trend has been an increase of 2.08 millimeters/year at the nearest tidal gauge to the region (Port Chicago, located in the San Francisco Bay) (NOAA, 2012). Mean sea level is expected to rise by approximately 12.3 to 60.8 centimeters by the Year 2050 at the Golden Gate Bridge (NRC, 2012). Because the Delta is tidally influenced, it would be affected by rising sea levels. A rise in sea level would increase hydrostatic pressure on levees currently protecting low-lying land in the Delta, much of which is already at or below sea level[6]. These effects threaten to cause potentially catastrophic levee failures that could inundate communities, damage infrastructure, and interrupt water supplies throughout the region and statewide (Hanak and Lund, 2008).

2.8.5. Water Quality

A changing climate will likely create challenges for the management of water quality in the region. The majority of water supply in the region is from the Delta, which has several water quality concerns, as described in Section 2.9.1. These water quality challenges could be exacerbated by climate change. There may be potential water quality problems associated with sea-level rise, such as increased salinity in receiving waters and areas serving drinking water intakes. There may also be issues associated with higher river and stream flows caused by increased storm events, such as an increase in turbidity and in the pollutants transported by mobilized sediment. Disinfectant byproduct precursors tend to spike during storm events (DWR 2001) and this problem could be more common if storm frequency increases. A decrease in annual precipitation would result in higher concentrations of contaminants during droughts and lower dissolved oxygen (DO).

[6] Many Delta islands have subsided 15 to 25 feet below sea level (Contra Costa County Hazard Mitigation Plan Update 2011).

As noted in Section 2.9.1, the Los Vaqueros Reservoir is used as a blending facility to improve the quality of water delivered to customers in the late summer and fall, when Delta water quality is lowest. If the amount of water stored in Los Vaqueros Reservoir during summer and fall decreases, this could limit the blending capabilities of the reservoir.

As noted as well in Section 2.9.1, failure of the Delta levee system could dramatically increase levels of chloride, bromide, and total organic carbon in Delta water and potentially render that water supply unusable for municipal or agricultural purposes. As noted earlier in this section, the risk of Delta levee system failure increases under climate change conditions.

Potential changes in Delta water quality associated with climate change could increase the disinfection byproducts such as bromate. Bromide in the source water is transformed into bromate during ozonation. The level of bromate formation is largely dependent on the amount of total organic carbon and bromide concentration in the source water. Bromate is suspected of contributing to kidney and thyroid cancer in humans. Sea-level rise could increase the intrusion of sea water and the bromide concentration of the Delta. Additionally, decreased freshwater flows into the Delta could increase organic matter. Combined, these two potential outcomes of climate change could increase bromate formation during the treatment of Delta waters; minimization or avoidance may necessitate changes to treatment technologies in ECCC.

Warmer temperatures associated with climate change could also lead to increased taste and odor events triggered by algal blooms; which are characterized by water quality changes during the spring and summer, such as increases in DO and DO saturation, pH, and total organic nitrogen. Many of the surface water treatment plants in the region are designed to address taste and odor events through preozonation. Although use of higher ozone dosages to control taste and odor events must also consider the need to control bromate formation.

2.8.6. Ecosystem and Habitat Vulnerability

The Delta is listed as one of the top 10 habitats to save for endangered species in a warming world in a report prepared by the Endangered Species Coalition (Endangered Species Coalition, 2011). The Delta provides habitat for hundreds of species of fish, birds, and other wildlife and enables the migration of Pacific salmon from spawning grounds in the upper reaches of cold-water rivers to the saline oceans and back again (Endangered Species Coalition, 2011). Regional climate-sensitive populations include salmonid species, migratory bird species, and wetland species (CEC, 2008).

Projected climate changes are likely to result in a number of interrelated and cascading ecosystem impacts. At present, most projected impacts are primarily associated with increases in air and water temperatures and include increased stress on fisheries that are sensitive to a warming aquatic habitat.

Warmer temperatures can compromise the health and resilience of aquatic and terrestrial species and make it more challenging for them to compete with nonnative species for survival. Competition for habitat and food will intensify with climate change. Further, climate change effects could compound with non-climate stressors, such as land-use changes, wildfire, and agriculture to cause habitat fragmentation at increasing rates, thus contributing to species

extinction (USFWS, 2009). Changes in seasonal runoff patterns may place additional stress on native species by affecting, for example, adult and juvenile migrations.

Increasing temperatures are likely to increase challenges for providing suitable habitat conditions for salmonid populations. Of specific concern within the region are Chinook salmon and steelhead, which prefer temperatures of less than 64.4 to 68 degrees Fahrenheit (°F) in mountain streams, although these anadromous fish may tolerate higher temperatures for short periods (Bennett, 2005). Increased water temperatures could reduce the habitat suitability of California rivers for these species (Reclamation, 2011).

Additionally, warmer air and water temperatures potentially could improve habitat for invasive species that outcompete natives. Invasive species, including various nonnative fish and plant species, are an ongoing issue within the region. Some invasive species, such as quagga mussels, may additionally impact maintenance of hydraulic structures. Further, climate changes could decrease the effectiveness of measures currently used to control invasive species (Hellman et al., 2008).

Warmer water temperatures also could spur the growth of algae, which could result in eutrophic conditions in lakes and reservoirs, declines in water quality (Lettenmaier et al., 2008), and changes in species composition. Other warming-related impacts include northward shifts in the geographic range of various species, impacts on the arrival and departure of migratory species, amphibian population declines, and effects on pests and pathogens in ecosystems (Reclamation, 2011). Impacts on terrestrial ecosystems have also been observed, including changes in the timing and length of growing seasons, timing of species life cycles, primary production, and species distributions and diversity (CEC, 2009c).

Additionally, the region's significant recreational economy (boating, fishing, biking, and hiking) could be affected by changes to the ecosystem and wildlife habitat.

2.8.7. Energy

In general, electricity production from hydroelectric power generation and other sources tend to be effected by weather patterns and temperature changes. Increases in peak energy demands throughout California and decreases in supply may decrease power supply reliability which in turn could alter or disrupt water diversions, water treatment, and wastewater disposal. The western U.S. energy crisis of 2000 and 2001, although not caused by climate change, demonstrated the gravity of unreliable supply.

The portion of the region's power supplies that come from systems with hydropower generation and hydroelectric generation as part of the utility portfolio is sensitive to potential climatic changes affecting the timing and magnitude of precipitation, runoff, and reservoir water levels. Direct impacts for ECCC may be energy reliability (brown outs) and cost. Water demands and production from conventional power plants located in the ECCC area can be expected to increase if out of area hydroelectric production decreases. Energy reliability is especially important for treatment and pumping operations.

In addition to sensitivity to water based generation concerns, reduced reliability could occur with a variety of other climate change and climate change mitigation variables such as:

- Availability of power supply sources (coal, other fuels) due to market availability or impediments to use (such as emissions concerns)
- Extreme temperatures driving intense competition among power users
- Diminished local supplies (wind)
- Damages to the delivery system and grid caused by fires and flood

2.8.8. Further Data Gathering and Analysis

Several agencies in the ECCC region will participate in a Regional Capacity Study that will evaluate and optimize regional water treatment plant operations, untreated water supply, and delivery processes to improve water supply reliability, and reduce water treatment costs.

2.8.9. Climate Change Mitigation and Adaptation Strategies

ECCC IRWM Plan participants recognize the importance of managing for climate change in the region. Management strategies include both mitigation and adaptation. Mitigation involves actions to reduce GHG emissions, while adaptation involves responding to the effects of climate change. Strategies already in place in the region include:

- Consumer education
- Conservation
- Water and wastewater management
- Green buildings
- GHG reductions
- Expansion of recycled water systems
- Community involvement

A potential adaptation strategy to increase water supply reliability is to develop infrastructure to tie into the water supply systems of nearby water agencies, such as East Bay Municipal Utility District, to reduce reliance on the Delta. Additionally, increasing recycled water usage will improve water supply reliability, since recycled water is not affected by hydrologic conditions. This will provide additional dry-year reliability for irrigation customers and other industrial users.

Appendix E includes a detailed list and descriptions of ongoing and planned mitigation and adaptation actions in the region.

Climate change mitigation and adaptation actions are also an important part of the IRWM planning process. GHG emissions are an important consideration in the project selection process described in greater detail in Section 3.4.2.

2.9. Water Quality

This section provides an overview of water quality concerns for the region's Delta water supplies and groundwater supplies. A summary of the constituents of concern for these supplies is included in **Table 2-9** and discussed in more detail in the paragraphs following.

2.9.1. Delta Water Quality

Delta water quality is highly variable depending upon the season, the water year, and the intake location. During dry years and seasons, Delta supplies contain high concentrations of total dissolved solids (TDS), chloride, and bromide. Total organic carbon (TOC) concentrations in Delta supplies are also highly variable, with increases generally corresponding to periods of increased runoff. These concerns are discussed in detail in the Delta Region Drinking Water Quality Management Plan (DRDWQMP). The Los Vaqueros Reservoir is owned and operated by CCWD, and is used to improve the water quality delivered to its customers. Water is pumped into Los Vaqueros Reservoir during spring and early summer months when Delta water quality is good. During the late summer and fall, when Delta water quality is poor, Delta supplies are blended with the high-quality water stored in Los Vaqueros Reservoir to improve the water quality delivered to CCWD's untreated and treated water customers. CCWD expanded the Los Vaqueros Reservoir capacity in 2012 from 100 TAF to 160 TAF.

Table 2-9. Constituents of Concern for ECCC Source Waters

Constituent of Concern	Reason	Regulatory Standard[1] (Goal)	Location
Total Dissolved Solids	Taste and odor Agricultural and industrial impacts	Secondary Standard: 500 mg/L	Delta Supplies, Groundwater, Recycled Water
Total Organic Carbon	Disinfection byproducts-THM, HAA precursor (public health concern)	MCLs – THM: 80 µg/L HAA5: 60 µg/L	Delta supplies
Bromide	Bromate precursor (public health concern)	(CALFED Goal: 50 µg/L)	Delta supplies
Chloride	Taste, corrosion	Secondary Standard: 250 mg/L	Delta supplies
Iron and Manganese	Filter deposits Rusty color Taste and odor	Secondary Standards: Iron: 0.3 mg/L Manganese: 0.05 mg/L	Groundwater
Arsenic	Bladder cancer Lung cancer	MCL: 10 µg/L	Groundwater
Boron	Reproductive toxicity	Action level: 1 mg/L	Groundwater
Nitrate (as NO_3)	Public health concerns	MCL: 45 mg/L	Groundwater

Note:
[1] MCLs and Secondary Standards are found in Title 22 of the California Code of Regulations

Key:
µg/L = micro grams per liter
CALFED = California Bay-Delta Program
Delta = Sacramento-San Joaquin Delta
ECCC = East Contra Costa County
HAA = Haloacetic acid
MCL = Maximum Contaminant Level
mg/L = milligrams per liter
NO_3 = Nitrate
THM = Trihalomethane

The quality of Delta water is dependent on maintenance of the Delta levee system as well as land and water management activities throughout the Delta and its larger watershed. Failure of the Delta levee system could dramatically increase levels of chloride, bromide, and TOC in the water and potentially render the water supply unusable for municipal or agricultural purposes. Similarly, changes in Delta land-use and water management practices, including many identified by CALFED and the BDCP (discussed below), could increase levels of undesirable constituents at ECCC intake locations. ECCC is particularly vulnerable to these changes since Delta water makes up the majority of the region's water supply.

Delta Operations

The majority of the ECCC region's water supply comes from the Delta. Changes in Delta operations by the State or federal government may impact water supply and water quality within the ECCC area. Therefore, the RWMG is tracking the progress of efforts in the Delta, including the BDCP.

2.9.2. Groundwater Quality

Several agencies, including the City of Pittsburg, DWD, and the City of Brentwood, use groundwater supplies to supplement their surface water. Groundwater quality generally meets drinking water quality standards with some exceptions. High and manganese levels TDS were observed in wells in the City of Pittsburg and DWD. The City of Brentwood has experienced significant degradation of groundwater quality due to nitrate contamination.

The groundwater suppliers in the region continue to manage the groundwater basins and their supplies. Methods used to improve the groundwater quality include blending with surface water, targeting deeper aquifers, and designing future wells with deep seals extending to confining zones to ensure source water protection.

2.9.3. Recycled Water Quality

Recycled water is engineered for safety and reliability so that the quality of the water is more predictable than many existing surface water and groundwater sources. In general, recycled water contains higher salinity content (reported as TDS) than potable water and is treated to suit its end use. For irrigation purposes, the rate at which salts accumulate in soils is an important factor in determining acceptable TDS levels. In addition, the salinity, sodium hazard (as determined by sodium adsorption ratio [SAR]), and potential toxicity to plant foliage and roots from other specific constituents are potential concerns. Sampling data for DDSD recycled water supplies shows that these supplies are within acceptable ranges for landscape irrigation. For industrial users, specifically those that use cooling towers, higher recycled water quality, through advanced treatment, would lower water demand resulting in chemical and water purchase cost savings.

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Chapter 3. Plan Development

This chapter presents the steps of the planning process and the outcomes for each. These outcomes include: objectives, resource management strategies, technical analyses, stakeholder involvement, project review process, and integration and coordination. The chapter describes the intention for the plan to be part of an ongoing process. It is considered by the ECWMA and regional stakeholders as a living document that will continue to be updated after the 2013 version.

3.1. Planning Framework

3.1.1. Background

With the enactment of Senate Bill (SB) 1672, the Integrated Regional Water Management Planning Act of 2002 (Act), the State of California affirmed the importance of IRWM. In this Act,[1] the Legislature found and declared:

> *"(a) Water is a valuable natural resource in California, and should be managed to ensure the availability of sufficient supplies to meet the state's agricultural, domestic, industrial, and environmental needs. It is the intent of the Legislature to encourage local agencies to work cooperatively to manage their available local and imported water supplies to improve the quality, quantity, and reliability of those supplies.*
>
> *(b) Improved coordination among local agencies with responsibilities for managing water supplies and additional study of groundwater resources are necessary to maximize the quality and quantity of water available to meet the state's agricultural, domestic, industrial, and environmental needs.*
>
> *(c) The implementation of the Integrated Regional Water Management Planning Act of 2002 will facilitate the development of integrated regional water management plans, thereby maximizing the quality and quantity of water available to meet the state's water needs by providing a framework for local agencies to integrate programs and projects that protect and enhance regional water supplies."*

The Act authorized regional water management groups to prepare and adopt a regional plan that addresses programs, projects, reports, or studies relating to water supply, water quality, flood protection, or related matters, over which any local public agency, that is a participant in that group, has authority to undertake.

It also required the DWR, the State Water Board, the State Department of Health Services, or CALFED,[2] as appropriate, to include in any set of criteria used to select the projects and programs they administer under specified provisions of law or under a specified Delta program a criterion that provides a benefit for qualified projects or programs.

[1] Division 6 of the Water Code, Section 1. Part 2.2 (commencing with Section 10530)

[2] CALFED responsibilities have transitioned to the Delta Stewardship Council, Resources Agency, and others

The voters similarly affirmed the importance of these efforts via passage of three significant bond measures:

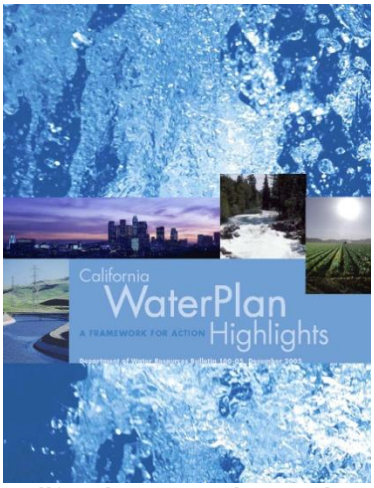
- **November 2002** – California voters pass Proposition 50, the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002, which provides $500 million (California Water Code [CWC] Section 79560-79565) to fund competitive grants for projects consistent with an adopted IRWM plan.

- **November 2006** – California voters pass Proposition 84, the Safe Drinking Water, Water Quality, and Supply, Flood Control, River and Coastal Protection Bond Act, which provides $1 billion (PRC Section 75001-75130) for IRWM planning and implementation.

- **November 2006 –** California voters pass Proposition 1E, the Disaster Preparedness and Flood Prevention Bond Act, which provides $300 million (PRC Section 5096.800-5096.967) for IRWM stormwater flood management.

California Water Plan Update 2005 featured IRWM as its Number 1 Initiative, describes its implementation as essential to the State's future, and listed the following IRWM principles:

- Use a broad, long-term perspective
- Identify broad benefits, costs, and trade-offs
- Promote sustainable resource management
- Increase regional self-sufficiency
- Increase regional drought preparedness
- Use open forums that include all communities
- Promote coordination and collaboration among local agencies and governments
- Use sound science, best data, and local knowledge



California Water Plan Update 2005 featured Integrated Regional Water Management

3.1.2. ECCC IRWM Plan 2013 Update Process

As described in Section 2.2, ECWMA and its members understood, well before the passage of the 2002 Act, the importance of regional integrated planning. The preparation of the 2013 IRWM Plan Update evolved from this strong foundation and incorporated the process and required components of DWR's IRWM Guidelines. **Figure 3-1** illustrates the IRWMP update activities.

During the update process, the ECWMA focused on setting regional objectives and establishing a transparent project review process.

This chapter describes in more detail how each component of the planning process was developed and how the components can be used into the future, to ensure a vital plan.

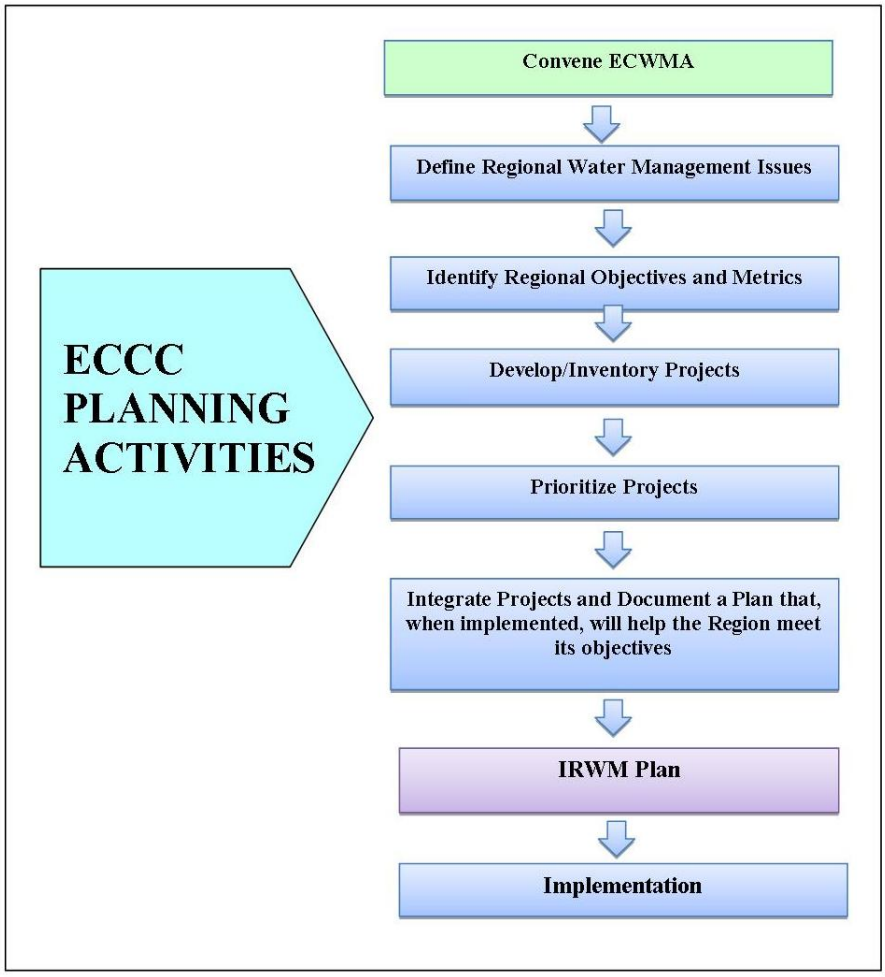


Figure 3-1. IRWM Planning Process

3.2. Objectives

The ECCC IRWM region is almost entirely dependent on Delta water supply and all or a portion of the cities and unincorporated communities are located within the statutory Delta. This distinction is important as the Delta is a physical place with legally defined boundaries and requirements, which add to ECCC water management complexity.

3.2.1. Water Management Challenges

The ECWMA explored water management issues that the region's water resources managers and stakeholders face. ECWMA reached out to members of the public, local agencies and other stakeholders with an invitation to participate in the discussion and learn more about the update process. During a workshop in February 2012, participants identified regional and local problems, challenges, resource conflicts, and opportunities to collaborate. During the session, five broad categories of issues were identified." Within each broad category, participants identified both issues and regional needs. The information gathered during the session was then compiled for review and refinement by the ECWMA.

Objectives Categories

Ultimately, five overarching issues and needs, listed below, were refined into objectives categories for use by the ECWMA in preparing detailed planning objectives and metrics, and establishing project selection criteria.

1. Water-quality-related regulations and water supply reliability.
2. Protection, restoration, and enhancement of the Delta ecosystem and other environmental resources.
3. Funding for water-related planning and implementation.
4. Stormwater and flood management.
5. Water-related outreach and equitable distribution of resources in the region.

In presenting the objectives in a list, the group expressly states the order does not imply that one issue or need is more important than another. The IRWM planning group views all objectives as important and to some extent inseparable. The five objectives are discussed in more detail below.

Water Quality and Reliable Supply

The ECCC IRWM region is almost entirely dependent on Delta water supply. The CCWD has made substantial investments in water storage and water quality by expanding the Los Vaqueros Reservoir, constructing the Old and Middle rivers water intakes, and improving the Rock Slough Intake. Unreliable surface water supply, especially in dry years continues to be a concern. Delta water supplies are subject to future Delta-wide influences (not controlled by the ECCC region) and can dramatically impact the quality and availability of surface water supplies for the region. As the most downstream user of Delta water supplies, the region is even more vulnerable to changes in water quality than other regions with Delta dependencies.

Uncertainty in future water quality and supply for the region is associated with proposed future projects (such as the Bay-Delta Conservation Plan BDCP), a fragile and somewhat unpredictable Delta ecosystem, climate change, and potential levee failure. (An associated concern is the ability of the region to meet future water quality treatment and discharge regulations.) A secure and reliable supply of water is a priority for the ECCC region.

Protection, Restoration and Enhancement of the Delta Ecosystem and Other Environmental Resources

Protection, restoration, and enhancement of the watersheds that drain to the Delta, the Delta ecosystem, and other environmental resources are important objectives for the region.

A small group enjoys a hike on the levee at the Dutch Slough Wetlands Restoration Project.

The conservation of the region's watersheds protects the local hydrology. Protected, restored and enhanced ecosystems provide important services to the built and natural communities in the region. The watersheds naturally attenuate flooding, reduce stormwater and polluted runoff, and limit creek erosion and sediment loading into downstream water bodies (the Delta). Additionally these protected habitats support State- and federally protected plant and animal species.

Water-infrastructure-related projects within the Delta often require wetland mitigation and these credits can be difficult and costly to obtain. Delta infrastructure projects are not covered by the ECCC HCP. That said, the region has several integrated ecosystem efforts already underway and CCWD has been able to self-mitigate for a number of its projects or use third-party mitigation companies.

ECWMA agencies participated in the ECCC HCP/NCCP. This Regional Conservation Plan was the basis for the biological/environmental components of the Functionally Equivalent IRWMP the ECCC region previously adopted. This HCP/NCCP provides regional conservation and development guidelines to protect and restore natural resources while improving and streamlining the permit process for endangered species and wetland regulations by proactively addressing the long-term conservation needs, the HCP/NCCP strengthens local control over land use and provides greater flexibility in meeting other needs such as housing, transportation, and economic growth in the area.

Some environmental protection and restoration projects are isolated, but they have the ability to have regional benefits on water quality, special status species and recreation. The ECCC IRWMP identifies a number of multi-objective projects are closely tied to other IRWMP objectives. These projects protect the region's ecosystem while providing other benefits. Two examples of these multi-objective projects are:

1. The Dutch Slough Wetlands Restoration[3] project, a collaborative effort of DWR and others, offers an opportunity for large-scale tidal marsh restoration, habitat enhancement, and open space preservation in the rapidly urbanizing area of eastern Contra Costa County and adjacent to the unlined portion of the Canal.

2. The Knightsen Wetland Restoration and Flood Control project is an effort of CCCFCWCD, ECCCHC, and Knightsen to acquire property and restore wetlands that will function to attenuate flood waters. Flood waters regularly inundate the community of Knightsen, such as in 1997 shown in **Figure 3-2**. The project will protect and restore habitat, address flooding, and provide recreational opportunities.

[3] Photos: http://www.dutchslough.org/events_meetings.html

Figure 3-2. Ecosystem Restoration can Attenuate Flooding Like that Experienced in Knightsen in 1997

Ecosystem Funding for Water-Related Planning and Implementation

Funding for water resources planning and implementation is a challenge for the region. In the mid-2000s the ECWMA began to more actively work together understanding significant State bond funds may become available via grants to support projects in integrated regional water management plans. In 2007, the region received a significant $12.5 million Proposition 50-based grant that supported numerous projects within the region. The region has also obtained close to $15 million in Proposition 1E-based grant funding.

The region has not been as successful seeking Proposition 84-based implementation grants. The bond language for this proposition allocated funds by the macro DWR regions described in the CWP. The ECCC IRWMP is within the allocation for the San Joaquin Region and there are 11 other IRWMPs within the region. Funds from this source have been limited with only two of the ECCC IRWMP entities receiving approximately $1.7 million from Round 1 grant funding. The region has submitted a second round IRWM Proposition 84 Implementation grant request and the ECCC IRWM group intends on applying for Round 3 of the IRWM funding in 2014. Beyond Round 3 IRWM funding it is not clear what State funds will be available for IRWM Implementation grants. A lack of State funding reduces the incentives to work together in the IRWM planning format due to the higher costs of formal planning.

For water service providers, the recent economic climate has resulted in lower retail water demands and less housing construction. The reduced water usage has impacted revenues for these agencies, creating variable or insufficient revenue streams. As the economy went into recession, sources of public funding have diminished. Constituents have been unwilling to support new tax or bond measures for water infrastructure-related funding. Additional funding

issues are a result of the competitive nature of receiving State and federal funding, limited available funds, and potential schedule delays associated with grant funding.

Stormwater and Flood Management

The ECCC IRWM region is located between the western Delta and Mount Diablo. It includes substantial low-elevation acreage.

The 2013 California Future Report a joint report of DWR and the USACE identified eastern Contra Costa as having a significant acreage of floodplains subject to 100-year flood events. A common misunderstanding exists that a 100-year flood is likely to occur only once in a 100-year period. In fact, there is approximately a 63.4 percent chance of one or more 100-year floods occurring in any 100-year period.

Selected Major ECCC Flood Events

1861–1862 Winter, The Great Flood
1955–1956 December–January, Christmas Flood
1962–1963 December–February
1968–1969 December–February, Winter '69 Storms
1970 April
1980 January–February, Delta Levee Break, Sacramento–San Joaquin Delta
1982–1983 November–March, Winter Storms
1990 May
1995 January–April, 1995 Christmas Flood
1998 January–March, El Niño Floods
2006 February 3–April 1, Spring Storms

Both localized floods from stormwater runoff and regional/catastrophic flooding due to levee failure are real threats to communities and the region as a whole. Of the past 11 president-declared natural disasters in the region, all but one (an earthquake) involved storms and flooding.

Increasing urbanization has also increased the consequences of flood and a changing hydrograph resulting from more intense storm events has put pressure on the flood control infrastructure. The flood control facilities protect communities, businesses, and agriculture and are integral to the built environment in ECCC. Flood infrastructure is reaching or exceeding its expected life and is likely to need significant repair or rebuilding over the next 40 years.

Climate change is projected to even future increase these risks, particularly related to more extreme weather events potentially swamping existing flood control systems.

Earthquakes, which are already a known regional risk, pose an additional risk to the ECCC levees that are essential for both water supply and flood protection.

Water-Related Outreach and Equitable Distribution of Resources in the Region

A final set of concerns relates to water-related outreach within the area. Outreach is essential for building voluntary citizen action that is necessary for the successful implementation of many of the IRWM programs. For example, community action is integral to water conservation programs, reducing pollutants entering storm drains, and volunteer creek restoration activities.

For example, the FOMCW conducts an annual Marsh Creek Cleanup Day at seven locations along Marsh Creek and its tributaries. Volunteers clean trash and debris from nearly 15 miles of the creek in partnership with the cities of Oakley and Brentwood, the East Bay Regional Park District, and the California Coastal Commission. In 2012, more than 600 volunteers turned out to remove approximately 8,500 pounds of debris from the creek, and recycled more than 1,000 pounds of debris.

A volunteer adds trash to a growing stack of debris collected during the 2011 Marsh Creek Cleanup

Beyond building an environmental stewardship ethic, outreach is necessary for residents to fully understand the regional water context, and particularly the regional dependence on the Delta. Ongoing efforts for communication and engagement will allow residents to better evaluate the need for investments in water infrastructure improvements and participate in water governance.

It is also important to recognize the substantial (23 percent) regional DAC population of the East Contra Costa County Region. One example is feedback related to ways to overcome limited access to waterways for subsistence fishing and recreation or infrastructure needs. Special steps are needed to ensure disadvantaged communities have access to the regional water decision-making process.

Appendix F includes additional details about the issues and regional needs.

3.2.2. Creating Measurable Objectives

With an understanding of the regional water management issues, the ECWMA had the necessary information to set objectives for the IRWM Plan (see related planning hierarchy in **Figure 3-3**). Objectives establish the desired outcomes of the IRWM Plan. Clearly defined and measurable objectives inform development of appropriate, innovative actions and project selection criteria.

A measureable objective describes an outcome that can be either quantitatively or qualitatively evaluated. Measureable objectives allow the region to determine if progress is being made and/or an objective has been reached.

A preliminary list of potential objectives and metrics was generated from the outreach meeting held in January, discussions with member agencies, the 2005 FEIRWM Plan, other regional and local plans.

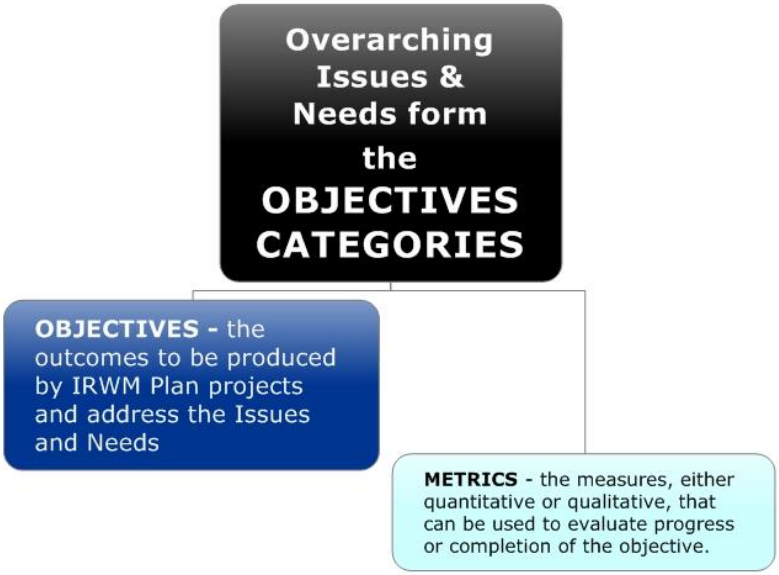


Figure 3-3. Planning Hierarchy

In March 2012, ECWMA conducted a second workshop to refine the regional objectives. No single objective was determined to be higher priority than the others. However, there are multiple sets of related objectives. Related objectives were grouped into topics to represent one priority for implementation. A single objective could fall into several topics, for example, maintaining Delta levees could assist with multiple topics, including flood control and Delta ecosystem protection. The ECWMA and its members felt that this list of objectives was comprehensive enough that, when implemented, the objectives would help them address their water management issues.

The objectives and metrics for the Water-Quality-Related Regulations and Water Supply Reliability Category are illustrated in **Figure 3-4**. A full list of the categories, objectives, and metrics is shown by topic in **Table 3-1** on the following pages.

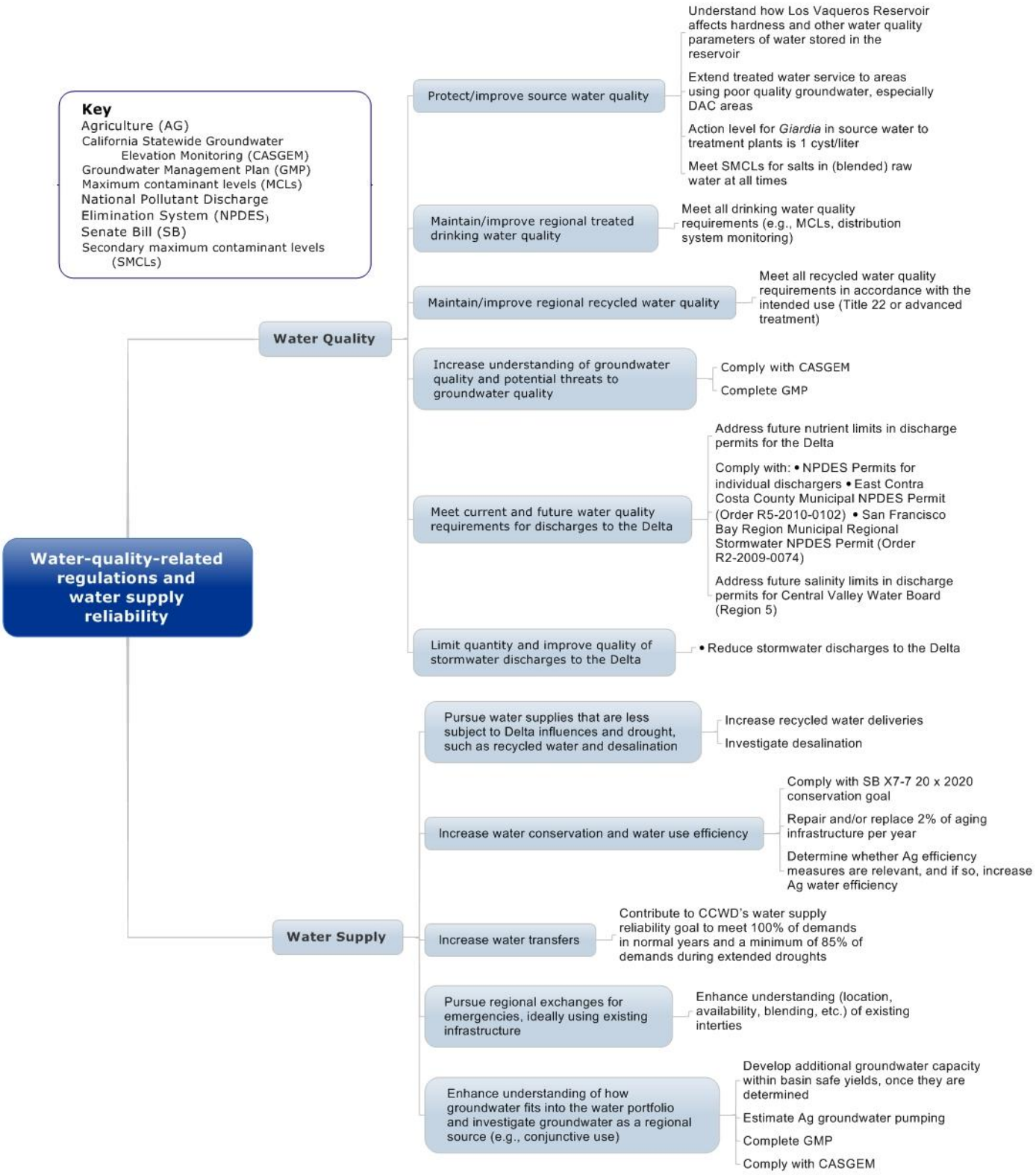


Figure 3-4. Planning Hierarchy for Water Quality and Supply

Table 3-1. ECCC Region Objectives and Metrics

Topic	Objective	Metric (Quantitative or Qualitative)
Water Quality and Related Regulations	• Protect/improve source water quality	• Meet SMCLs for salts in (blended) raw water at all times • Action level for *Giardia* in source water to treatment plants is 1 cyst/liter • Understand how Los Vaqueros Reservoir affects hardness and other water quality parameters of water stored in the reservoir • Extend treated water service to areas using poor quality groundwater, especially DAC areas
	• Maintain/improve regional treated drinking water quality	• Meet all drinking water quality requirements (e.g., MCLs, distribution system monitoring)
	• Maintain/improve regional recycled water quality	• Meet all recycled water quality requirements in accordance with the intended use (Title 22 or advanced treatment)
	• Increase understanding of groundwater quality and potential threats to groundwater quality	• Comply with CASGEM • Complete GMP
	• Meet current and future water quality requirements for discharges to the Delta	Comply with: • NPDES permits for individual dischargers • East Contra Costa County Municipal NPDES Permit (Order R5-2010-0102) • San Francisco Bay Region Municipal Regional Stormwater NPDES Permit (Order R2-2009-0074) • Likely future nutrient limits in discharge permits for the Delta • Likely future salinity limits in discharge permits for Central Valley Water Board (Region 5)
	• Limit quantity and improve quality of stormwater discharges to the Delta	• Reduce stormwater discharges to the Delta
Stormwater and Flood Management	• Manage local stormwater	• Compliance with ECCC Municipal NPDES Permit (Order R5-2010-0102) • Compliance with Contra Costa Clean Water Program • Consistency with Contra Costa County's 50-Year Plan • Inspect or conduct condition assessment of 5-10% of existing stormwater infrastructure per year
	• Improve regional flood risk management	• Achieve a 200-year level of protection for urban areas • Achieve a 100-year level of protection for small communities • Improve level of protection for Ag/rural • Coordinate with county Multi-Hazard Mitigation Plans

Table 3-1. ECCC Region Objectives and Metrics (contd.)

Topic	Objective	Metric (Quantitative or Qualitative)
Water Supply Reliability	• Pursue water supplies that are less subject to Delta influences and drought, such as recycled water and desalination	• Increase recycled water deliveries • Investigate desalination
	• Increase water conservation and water use efficiency	• Comply with SB X7-7 20 x 2020 conservation goal • Repair and/or replace 2% of aging infrastructure per year • Determine whether Ag efficiency measures are relevant, and if so, increase Ag water efficiency
	• Increase water transfers	• Contribute to CCWD's water supply reliability goal to meet 100% of demands in normal years and a minimum of 85% of demands during extended droughts
	• Pursue regional exchanges for emergencies, ideally using existing infrastructure	• Enhance understanding (location, availability, blending, etc.) of existing interties
	• Enhance understanding of how groundwater fits into the water portfolio and investigate groundwater as a regional source (e.g., conjunctive use)	• Develop additional groundwater capacity within basin safe yields, once they are determined • Estimate Ag groundwater pumping • Comply with CASGEM • Complete GMP
Protection, Restoration and Enhancement of the Delta Ecosystem and Other Environmental Resources	• Protect, restore and enhance habitat in the Delta and connected waterways[4] • Protect, restore and enhance the watersheds that feed and contribute to the Delta Ecosystem	• Achieve wetland restoration and preservation goals of ECCC HCP/NCCP • Consider climate change adaptation in all enhancement/restoration strategies
	• Minimize impacts to the Delta ecosystem and other environmental resources	• Work collaboratively with ECCC HCP/NCCP on development of all future IRWM Plan projects • Comply with CEQA/NEPA for all applicable projects
	• Reduce greenhouse gas emissions	• Reduce operational energy use by 5% • Consider climate change adaptation in all mitigation strategies
	• Protect Delta ecosystem against habitat disruption due to emergencies, such as levee failure	• [See flood management]
	• Increase shoreline access for subsistence fishing and recreation"	• Reduce illegal activities (trespassing) related to subsistence fishing and recreation

[4] This includes all waterways, not just those in the statutory Delta, as all the waterways drain to the Delta.

Table 3-1. ECCC Region Objectives and Metrics (contd.)

Topic	Objective	Metric (Quantitative or Qualitative)
Funding for Water-Related Planning and Implementation	• Increase regional cost efficiencies in treatment and delivery of water, wastewater, and recycled water	• Maintain or reduce unit cost of treating and conveying water • Maximize use of existing infrastructure
	• Develop projects with regional benefits that are implementable and competitive for grant funding	• Collaborate on projects, inter- or intra-regionally • Update prioritization process regularly to keep it relevant (regional, integrated, project readiness, fundability, available cost share) • Encourage cooperation from smaller entities and stakeholders, including assistance with matching funds
	• Use financial resources strategically to maximize return on investment on grant applications for project development/implementation	• Implement decision-making process in pursuing grant opportunities (regional, integrated, project readiness, fundability, available cost share, and stated DWR priorities)
	• Develop a funding pool to self-fund regional efforts such as grant applications, outreach, Web site development, and other planning activities	• Reinitiate program to collect annual regional fees using ECWMA funding mechanism • Implement decision-making structure for using the funds
	• Increase public awareness of project importance to pass ballot measures or obtain matching funds through other means that require public support Ensure projects with existing matching funds are prioritized to maximize regional funding opportunities.	• [see Other Aspects topic]
Outreach	• Identify and engage DACs	• Regularly refine DAC maps and outreach strategies based on new available data.
	• Collaborate with and involve DACs in the IRWM process	• Increase number of projects in the IRWM Plan that benefit DACs
	• Promote equitable distribution of proposed projects across the region	• Increase geographic distribution of IRWM Plan projects
	• Increase awareness of water resource management issues and projects with the general public	• Develop educational/outreach material for the Web site and other venues

Key:
Ag = agriculture
CASGEM = California Statewide Groundwater Elevation Monitoring
CCWD = Contra Costa Water District
CEQA = California Environmental Quality Act
DAC = Disadvantaged Community
Delta = Sacramento-San Joaquin Delta
DWR = California Department of Water Resources
ECCC = East Contra Costa County
ECCC HCP/NCCP = East Contra Costa County Habitat Conservation Plan/ Natural Community Conservation Plan
ECWMA = East County Water Management Association
GMP = Groundwater Management Plan
IRWM = integrated regional water management
MCL = maximum contaminant level
NEPA = National Environmental Policy Act
NPDES = National Pollutant Discharge Elimination System
SB X7-7 = Senate Bill X7-7
SMCL = Secondary Maximum Contaminant Level

3.2.3. Living Document

Using the established, published objectives, the region's stakeholders can work to find synergies and efficiencies in water resources planning and project development. The 2013 IRWM Plan Update is designed to produce living document intended to add/delete projects from funding lists, adjust goals and objectives, and add member agencies as the region changes and the plan is implemented. Over time the ECWMA will need to reexamine regional objectives in light of changed conditions in the economy, environment, or changes in the region's priorities. The need for this in the ECCC region is perhaps more pronounced than might be found in other regions due to the evolving context of Delta management and the extent to which the future of the region is tied to its water source. Objectives may need to be revised as a result of:

- Shifts in environmental conditions or water quality
- To address new regulations or shifts in State policy
- It becomes evident, during implementation, that the region is unable to realistically or reasonably achieve the established objectives.

The 2013 ECCWMA IRWM Plan will also be updated to reflect the Round 2 implementation grant work. Beyond that, until the next formal update or amendment to the IRWM Plan, the objectives and the intent of the region are established and available to help guide project development.

3.3. Resource Management Strategies

The ECWMA considered the strategies and approaches required to address the region's objectives. DWR guidelines require the IRWM Plan to document the range of Resource Management Strategy(ies) (RMS) considered to meet the IRWM objectives and identify which RMSs were incorporated into the IRWM Plan. The effects of climate change on the IRWM region must factor into the consideration of RMSs. To be considered, RMSs must include those found in Volume 2 of the CWP Update 2009. Additionally, DWR is in the process of developing CWP Update 2013 and three new RMSs are being added, all of which are incorporated into this ECCC IRWM Plan Update.

RMSs are defined as "a project, program, or policy that helps local agencies and governments manage their water, and related resources." These are referred to as the tool kit of the CWP. The goal of the toolkit is to encourage a region to consider and, if possible, build a diversified portfolio of water management strategies to address needs and objectives. DWR understands these RMSs are already being used, but wants to encourage a methodical assessment of how regional options for diversification have been considered

The list of RMSs was shared with the ECWMA and stakeholders to consider when developing projects. Of the 33[5] individual tools described in the CWP 2009 RMS section, the ECWMA identified 24 with potential for use in meeting the IRWM Plan objectives, plus the three new CWP 2013 RMSs. **Appendix G** includes the full list of resource management strategies, the assessment of applicability to the region, and the analysis of why or why not the tools could be applied. The RMSs moved forward for consideration in the ECCC IRWM Plan are listed in

[5] There are 28 Resource Management Strategies in CWP 2009; however, several of the strategies contain multiple tools.

Table 3-2, and **Table 3-3** illustrates the relationship between the RMSs and proposed ECCC projects.

Table 3-2. ECCC Applicable RMS List

1. Agricultural Lands Stewardship	14. Pollution Prevention
2. Agricultural Water Use Efficiency	15. Recharge Area Protection
3. Conjunctive Management & Groundwater Storage	16. Recycled Municipal Water
4. Conveyance – Delta	17. Salt and Salinity Management
5. Conveyance – Regional/local	18. Surface Storage – CALFED
6. Desalination	19. Surface Storage – Regional/Local
7. Drinking Water Treatment and Distribution	20. System Reoperation
8. Economic Incentives (Loans, Grants, and Water Pricing)	21. Urban Runoff Management
9. Ecosystem Restoration	22. Urban Water Use Efficiency
10. Flood Risk Management	23. Water Transfers
11. Irrigated Land Retirement	24. Water-Dependent Recreation
12. Land Use	25. Watershed Management
13. Matching Quality to Use	26. Sediment Management
	27. Water and Culture
	28. Outreach and Education

Key:
CALFED = California Bay-Delta Program
ECCC = East Contra Costa County
RMS = Resource Management Strategy

Table 3-3. ECCC IRWM Plan Projects – Resources Management Strategies vs. Objective Categories

Objective Categories	Resource Management Strategies: Reduce Water Demand		Improve Operational Efficiency and Transfers				Increase Water Supply						Improve Water Quality						Improve Flood Management	Practice Resources Stewardship							Other Strategies						Total Number of Times that Projects meet this Objective Category
	Agricultural Water Use Efficiency	Urban Water Use Efficiency	Conveyance – Delta	Conveyance – Regional / Local	System Reoperation	Water Transfers	Conjunctive Management & Groundwater Storage	Desalination	Precipitation Enhancement	Recycled Municipal Water	Surface Storage - CALFED	Surface Storage - Regional / Local	Drinking Water Treatment and Distribution	Groundwater Remediation / Aquifer Remediation	Matching Quality to Use	Pollution Prevention	Salt and Salinity Management	Urban Runoff Management	Flood Risk Management	Agricultural Lands Stewardship	Economic Incentives (Loans, Grants and Water Pricing)	Ecosystem Restoration	Forest Management	Recharge Area Protection	Water-Dependent Recreation	Watershed Management	Crop Idling for Water Transfers	Dewvaporation or Atmospheric Pressure Desalination	Fog Collection	Irrigated Land Retirement	Rainfed Agriculture	Waterbag Transport / Storage Technology	
Water Quality and Related Regulations	1	11	1	7	2	1	3	2	0	10	0	1	8	0	11	18	11	19	20	4	5	11	1	1	1	17	0	0	0	0	0	0	166
Water Supply	0	15	2	5	2	2	5	3	0	10	0	1	6	0	7	4	8	4	5	1	3	3	0	0	1	2	0	0	0	0	0	0	89
Restoration and Enhancement of the Delta Ecosystem and Other Environmental Resources	1	13	2	7	2	1	3	2	0	10	0	1	4	0	9	15	9	14	15	3	5	13	1	1	1	14	0	0	0	0	0	0	146
Funding for Water-Related Planning and Implementation	1	14	2	7	2	2	5	3	0	10	0	1	6	0	8	12	9	13	13	3	4	10	0	0	1	12	0	0	0	0	0	0	138
Stormwater and Flood Management	1	1	1	3	1	0	0	0	0	1	0	1	3	0	3	17	3	23	23	2	0	11	1	1	0	18	0	0	0	0	0	0	114
Water-Related Outreach	1	9	0	4	2	0	2	1	0	8	0	1	5	0	9	13	7	10	11	2	5	10	1	0	1	9	0	0	0	0	0	0	111
Total Number of Times that Project meet this Resource Management Strategy	3	24	3	14	5	2	7	4	0	19	0	3	14	0	20	42	19	46	47	7	9	31	2	1	2	39	0	0	0	0	0	0	

How to use this table:

The number found in each cell represents the number of ECCC IRWMP projects that fulfill an objective in the objective category found in that row and utilities the resource management strategy found in that column. There are 55 projects in total. All of the projects claim to fulfill multiple objectives and utilize multiple resource management strategies, thus the total number times that projects in any one row (objective category) or column (resource management strategy) may be greater than the total number of projects submitted.

3.4. Project Review Process

The DWR IRWM Plan Guidelines require a process or processes to select projects for inclusion in the IRWM Plan. The selection process(es) must include the following components:

- Procedures for submitting a project to the RWMG (ECWMA)
- Procedures for reviewing projects considered for inclusion into the IRWM Plan
- How the project contributes to the IRWM Plan objectives
- How the project is related to resource management strategies selected for use in the IRWM Plan
- Technical feasibility of the project
- Specific benefits to DAC water issues
- EJ considerations
- Project costs and financing

This section describes the ECWMA process to collect, review, and maintain the region's list of projects to address all the requirements set forth in the IRWM Guidelines. The process was presented and accepted at a workshop attended by the ECWMA and stakeholders on July 11, 2012.

3.4.1. Project Submission

To be considered in the IRWM Plan, project proponents submitted candidate projects using the region's Web site, described in Section 3.6, Stakeholder Involvement. The Web site contains information about why submitting a project could be beneficial, how projects will be evaluated, and instructions for how to submit. Submitting a new project requires providing a valid e-mail address and completing an online form with information about the project; the form may be saved, revisited, and edited until the user clicks "Submit." Once submitted, an IRWM administrator acknowledges the project and the information is moved into the project database. Select information about the projects in the database can be viewed by Web site visitors in map or list format.

The online project submission form was developed in accordance with DWR's IRWM Guidelines, with the purpose of collecting information needed to comply with the specified project review process. The requested information included:

- Project sponsor/proponent information
- Location
- Description
- Partners
- Stakeholder involvement
- Regional objectives met

- Program preferences met
- Statewide priorities met
- RMSs used
- Status
- Costs and funding
- Addressing needs of DACs, EJ, climate change
- Data management

To get an initial list of projects, the ECWMA held a formal "Call for Projects" from May 31 through September 20, 2012. The ECWMA met to discuss the projects on September 25, 2012, and agreed that projects may continue to be submitted through the region's Web site. For the IRWM Plan Update, an October 2012, date was used for evaluation and analysis of the 54 projects. With the list of projects gathered during this period, 54 projects, from 14 different proponents, were included for this plan analysis. Additional calls for projects will occur as needed and additional plans were added for consideration as part of the Round 2 Implementation Grant process.

This flexibility is encouraged as packages of projects are more likely to result in integrated and multi-objective approaches.

3.4.2. Project Review Factors

Many project review factors were considered for evaluating projects for inclusion in the IRWM Plan. As noted above, the IRWM Guidelines prescribe certain review factors, and the ECWMA and its members included additional factors that reflect its regional planning priorities. Review factors were grouped into three categories:

1. **Project Score** – Projects were given points by how well they met the region's objectives, the State's program preferences and statewide priorities, and a set of additional review factors, including improvements for DACs, EJ, and GHG reductions.

2. **RMS Diversification Score** – Projects were given points by their ability to diversify the number of RMSs considered.

3. **Implementation Considerations** – Information about the projects' readiness and economic feasibility was also collected.

Each of the review factors are described below and shown in **Figure 3-5**. Each category of review factors (score, RMS diversification, and implementation considerations) needs to be considered in tandem when evaluating projects to get a complete picture of the merit of a particular project. As grant or other funding opportunities arise, the ECWMA and its members will use all three factors to determine its highest priority projects. For instance, if there is an IRWM implementation grant funding opportunity, it is not as simple as taking the projects with the highest scores because they may not be geographically diverse, they all may be a similar type of project, they all may be from one proponent, or they may not all be ready to proceed. Therefore, a project's score is only one-third of the story and a "high" score does not guarantee a

project will advance, just as a "low" score does not eliminate a project from future considerations.

3.4.3. Project Scoring Criteria

Each project was evaluated based on its contributions to meet the following regional objectives and statewide priorities and preferences with regional significance:

- **Regional Objectives** – Section 3.2.2 describes the region's objectives. Some objectives will be implemented through the IRWM Program as a whole and are not relevant to individual projects, but most of the objectives were used to evaluate candidate projects.

- **IRWM Program Preferences** – The IRWM Program Preferences are published in the IRWM Guidelines. These are preferences for selecting proposals for grant funding, and therefore represent what the State ultimately prefers to implement through its IRWM Program. Certain preferences are relevant to individual projects, while others are relevant to the IRWM planning process. Projects that address more preferences are more likely to align with the State's IRWM goals and rank favorably in grant funding opportunities.

- **Statewide Priorities** – A subset of the IRWM Program Preferences, Statewide Priorities were included in the review criteria for the same reasons.

- **Other IRWM Guideline Review Factors** – Several review factors suggested in the IRWM Guidelines are not explicitly covered in the above considerations, but are appropriate to consider when scoring project merits.

These project scoring criteria are shown in **Table 3-4**, followed by a discussion of the numeric approach used to score each project.

Table 3-4. Project Scoring Criteria

Topic	Project Scoring Criteria
Regional Objectives	
Water Supply	Pursue water supplies that are less subject to Delta influences and drought, such as recycled water and desalination
	Increase water conservation and water use efficiency
	Increase water transfers
	Pursue regional exchanges for emergencies, ideally using existing infrastructure
	Enhance understanding of how groundwater fits into the water portfolio and investigate groundwater as a regional source (e.g., conjunctive use)
Water Quality and Related Regulations	Protect/improve source water quality

Table 3-4. Project Scoring Criteria (contd.)

Topic	Project Scoring Criteria
Protection, restoration and Enhancement of Delta Ecosystem and Other Environmental Resources	Protect, enhance, and restore habitat in the Delta and connected waterways Protect, restore, and enhance habitat in the watersheds that contribute to the delta ecosystem
	Minimize impacts to the Delta ecosystem and other environmental resources
	Reduce greenhouse gas emissions
	Protect Delta ecosystem against habitat disruption due to emergencies, such as levee failure
	Provide better accessibility to waterways for subsistence fishing and recreation
Funding for Water-Related Planning and Implementation	Increase regional cost efficiencies in treatment and delivery of water, wastewater, and recycled water.
	Develop projects with regional benefits that are implementable and competitive for grant funding
	Increase public awareness of project importance to pass ballot measures or obtain matching funds through other means that require public support
	Maintain/improve regional treated drinking water quality
	Maintain/improve regional recycled water quality
	Increase understanding of groundwater quality and potential threats to groundwater quality
	Meet current and future water quality requirements for discharges to the Delta
	Limit quantity and improve quality of stormwater discharges to the Delta
Stormwater and Flood Management	Manage local stormwater
	Improve regional flood risk management
Regional Objectives	
Outreach	Collaborate with and involve DACs in the IRWM process
	Increase awareness of water resources management issues and projects with the general public
IRWM Program Preferences and Statewide Priorities	
IRWM Program Preferences	Effectively resolve significant water-related conflicts within or between regions
	Contribute to attainment of one or more CALFED objectives: • Improve the State's water quality from source to tap • Reduce the threat of levee failures that would lead to seawater intrusion • Allow for the increase of water supplies and more efficient and flexible use of water resources • Improve the ecological health of the Bay-Delta watershed
	Effectively integrate water management with land-use planning
Statewide Priorities	Drought preparedness
	Use and reuse water more efficiently
	Climate change response actions
	Expand environmental stewardship
	Protect surface water and groundwater quality
	Improve tribal water and natural resources
	Ensure equitable distribution of benefits

Table 3-4. Project Scoring Criteria (contd.)

Topic	Project Scoring Criteria
Other Review Factors in IRWM Guidelines	
Other Guideline Review Factors	Environmental justice considerations
	Contribution of the project in reducing greenhouse gas emissions as compared to project alternatives

Key:
CALFED = California Bay-Delta Program
DAC = Disadvantaged Community
Delta = Sacramento-San Joaquin Delta
IRWM = Integrated Regional Water Management

Using the above list of scoring criteria, each project was scored based on its merit and its ability to help the region meet its planning priorities.

A project received a numeric score for each of the four categories of scoring criteria as follows:

1. **Regional Objectives** – One point was given for each objective that was met by the project. In determining how to score projects against the region's objectives, several numeric methods were evaluated, including assigning equal significance to each objective (one point per objective), assigning equal significance to each topic (a fraction of a point per objective, where the fraction relates to the number of objectives in a topic), and rewarding projects that address multiple topics. A sensitivity analysis was run with a suite of diverse projects from the 2005 FEIRWM Plan to compare the outcome of the three different scoring approaches, and the outcomes were all similar with respect to ranking and relative score. The region decided to use the approach of awarding each project one point per objective that the project meets. A project's ability to meet regional objectives was self-reported in the project submission form.

2. **IRWM Program Preferences** – One point was given for each IRWM Program Preference that was met. One program preference is the project's contribution to the following CALFED objectives:

    - Water Quality
    - Levees
    - Water Supply
    - Ecosystem Restoration

    One point was given to each CALFED objective addressed by the project. A project's ability to meet IRWM Program Preferences was self-reported in the project submission form.

3. **Statewide Priorities** – One point was given for each statewide priority that was met. A project's ability to meet statewide priorities was self-reported in the project submission form.

4. **Other factors from IRWM Guidelines** – Three factors in the IRWM Guidelines were not explicitly addressed in the above categories, so they were evaluated separately: DAC and EJ considerations and contribution of the project in reducing GHG emissions as compared to project alternatives. Assessment of EJ impacts and avoidance or mitigation of any adverse effects is completed through the National Environmental Policy Act/ California Environmental Quality Act (NEPA/CEQA) process. It was therefore assumed that all projects would meet this criterion adequately before implementation. However, a project was given a point if it went above and beyond the requirements, or consisted of a study that included EJ considerations. A project's ability to address these factors was self-reported in the project submission form.

Each of the four categories of scoring criteria was assigned a weighting factor (shown in **Figure 3-5**), representing the relative importance to the region in the scoring process.

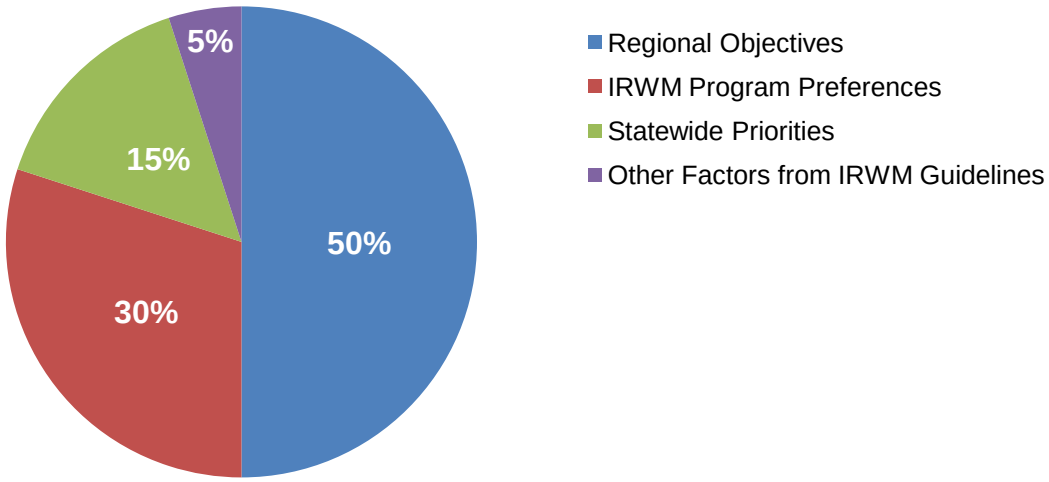


Figure 3-5. Relative Weighting Factors for Project Scoring Criteria

As shown above, regional objectives have the highest weighting factor of 50 percent, indicating the relative importance of addressing local water management issues. IRWM Program Preferences and statewide priorities together make up 45 percent, and the remaining 5 percent is allocated to other factors from the IRWM Guidelines. Using this distribution, an overall score was generated for each project.

Resource Management Strategies

Section 3.3, Resource Management Strategies, and **Appendix G** describe in more detail the evaluation of the RMS portfolio. All the RMSs were considered when project information was collected to understand the greatest potential range of strategies a project could address. A project's ability to meet an RMS was self-reported in the project submission form.

Projects were evaluated to determine which RMS it would satisfy and then given a total RMS score based on the number of RMS diversification criteria satisfied. Projects that included a greater number of strategies were considered to contribute more to a diversified water management portfolio for the ECCC region. RMS diversification did not contribute to the

project score, but was given as a separate consideration for the region in identifying implementation priorities or proposals for grant funding.

Implementation Considerations

In addition to the project score and RMS diversification criterion, implementation considerations were also collected for each project. These considerations are shown in **Table 3-5**. The implementation consideration information was self-reported in the project submission form.

Table 3-5. Implementation Considerations

Implementation Consideration	Information Collected
Readiness to Proceed	The status and competition date of planning, design, and construction/implementation.
Project Financing	Total project cost and total project amount funded, which allowed a percent of project funded to be calculated, as well as the current availability of a project economic feasibility analysis.

Project Review Factors in IRWM Guidelines

As noted above, the IRWM Guidelines specify certain review factors to be considered in the project review process and for use in selecting for inclusion in the IRWM Plan. These are listed in **Table 3-6**, and for each criterion, a description is provided of how it was considered in the project evaluation process.

Table 3-6. Project Review Factors in IRWM Guidelines

Topic	Approach in Project Evaluation Process
Technical Feasibility	Technical feasibility is a review factor in project screening. All projects were evaluated for technical feasibility in early project screening, and projects were eliminated if they were not technically feasible. Therefore, technically unfeasible projects needed no additional review. No projects lacking technical feasibility were submitted in this Call for Projects during the first submission round.
Benefits Critical DAC Issues	Benefit to DACs is included as a project scoring criterion, as part of assessing the project's ability to address additional IRWM guideline review factors. There are many opportunities for projects to benefit DACs.
Native American Tribal Communities	Benefit to Native American tribal communities is included as a project scoring criterion, as part of assessing the project's ability to address statewide priorities. However, there are no tribal communities in the ECCC region. A future proposal may include something benefiting tribal communities; for example, enhancement of habitat suitable for plants that may be used for cultural purposes.
Environmental Justice Considerations	Environmental justice considerations are included as a project scoring criterion, as part of assessing the project's ability to address additional IRWM Guidelines review factors.
Project Costs and Financing	Project costs and financing are included as implementation considerations.
Economic Feasibility	Economic feasibility is included as an implementation consideration.
Project Status	Project status is included as an implementation consideration.

Table 3-6. Project Review Factors in IRWM Guidelines (contd.)

Topic	Approach in Project Evaluation Process
Strategic Considerations for IRWM Plan Implementation	Strategic considerations were considered as part of the project screening. Strategic considerations for combining or modifying local projects into collaborative regional projects were considered after the projects were submitted; The region identified opportunities for such modifications and initiated discussions directly with the project proposer(s). If project modifications were agreeable, the project was resubmitted. This occurred before this phase of the evaluation.
Project Adaptations for Climate Change	Climate change adaptation is included as a project scoring criterion, as part of assessing the project's ability to address regional objectives and statewide priorities. Climate change is also its own standard in the IRWM Plan.
Greenhouse Gases	Reduction of greenhouse gases is included as a project scoring criterion, as part of assessing the project's ability to address additional IRWM Guideline review factors.

Key:
DAC = Disadvantaged Community
ECCC = East Contra Costa County
IRWM = integrated regional water management

3.4.4. Project Review Steps

After projects were received and review criteria developed, the process for prioritizing projects and programs within the ECCC region involved the following sequential steps:

1. **Perform initial screening of projects for inclusion** – Projects were screened for their relevance to water management and technical feasibility before being included in the IRWM Plan. No projects were eliminated at this step.

2. **Review benefits claimed by each project** – Text entries were required in the project submission form to justify why certain benefits were claimed, for those related to the regional objectives and the IRWM Program Preferences. The region met to review these explanations to verify that the project proposers understood the intent and that their benefit claims seemed reasonable before those benefits were accounted for in the evaluation of projects. After reviewing rationale for claimed benefits, project proposers were permitted to modify their submissions to have consistent evaluations. For example, if a project claimed meeting an ecosystem objective based on compliance with CEQA/NEPA, this would be eliminated as a project differentiator because all projects would follow that same process.

3. **Project integration and coordination** – Opportunities were sought to combine, evaluate, expand, and/or modify projects to achieve multiple benefits, expand local benefits to a regional scale, and/or enhance projects to address more regional objectives. For example, two similar projects that are geographically adjacent could be combined into a single effort to maximize implementation efficiency, or a project could be modified to include more comprehensive DAC benefits and outreach.

4. **Evaluate and score projects** – Each project was evaluated, based on the process described above, to arrive at a project score, RMS diversification, and a set of implementation considerations. The resulting data allowed the region to create multiple lists prioritizing or sorting the projects based on a number of factors, including project

type, primary ECCC IRWM Plan objective category, project score, RMS diversification, project status (determined by design date), total cost, and percent funded. Creating a variety of lists sorted or prioritized by multiple criteria gave the region a better understanding of where different projects excelled and laid a framework for a more comprehensive view of the suite of projects, in particular which projects might be strongest under the diverse possible grant alternatives.

5. **Iterate** – After the first round of project scores, further opportunities were sought for project integration and coordination. Upon improving projects, projects were reevaluated and rescored.

6. **Develop implementation plan** – The implementation plan is a suite of priority projects that, when implemented, will help the region to meet its objectives.

3.4.5. Documenting the Projects

For the purposes of this IRWM Plan Update, an initial list of projects was submitted and reviewed. The reviewed projects are listed by sponsoring agency/organization summarized in **Table 3-7** and are shown on the IRWM Web site. Full details about these projects may be found in **Appendix E**. Note that the numbering of the projects in the table below bears no relationship to rank or priority, instead the numbers related to order in the database.

Table 3-7. Initial List of IRWM Projects

Sponsoring Agency / Proponent	Project Title
Antioch Youth Sports Complex	1. Recycled Water for American Youth Soccer Organization
Bethel Island Municipal Improvement District	2. BIMID Levee and Pump Station Improvement Project
City of Antioch	3. Drainage Area 55 – West Antioch Creek Channel Improvements
	4. Viera Water and Sewer Service, Northeastern Antioch
City of Pittsburg	5. City of Pittsburg Water Treatment Plant Improvements Project
	6. Rossmoor Well Replacement Project/Groundwater Monitoring Well System expansion
Contra Costa Clean Water Program	7. Mercury Reduction Benefits of Low Impact Development
Contra Costa County	8. East Contra Costa County Green Street Retrofit Network
	9. Knightsen Biofilter – Flood Control Project
Contra Costa County Flood & Water Conservation Control District	10. Upper Sand Creek Basin Surplus Material (#220)
	11. Deer Creek Reservoir Seismic Assessment (#212)
	12. East Antioch Creek Marsh Restoration (#206)
	13. Marsh Creek Reservoir Capacity and Habitat Restoration (#213)
	14. Marsh Creek Reservoir Seismic Assessment (#210)
	15. Marsh Creek Supplemental Capacity and Basin Development (#215)
	16. Marsh Creek Widening Between Dainty Avenue and Sand Creek (#216)
	17. Oakley and Trembath Detention Basins (#207)

Table 3-7. Initial List of IRWM Projects (contd.)

Sponsoring Agency / Proponent	Project Title
	18. West Antioch Creek Improvements: 10th Street to 'L' Street (#203)
	19. Dry Creek Reservoir Seismic Assessment (#211)
	20. Kellogg Creek Sedimentation Basin (#226)
	21. Lower Sand Creek Basin Construction (#222)
Contra Costa County Flood Control District	22. Deer Creek Reservoir Expansion (#217 and #218)
Contra Costa Flood Control and Water Conservation District	23. Marsh Creek Methylmercury and Dissolved Oxygen Assessment
Contra Costa Water District	24. BBID-CCWD Regional Intertie
	25. Contra Costa Canal Levee Elimination and Flood Protection Project
	26. Los Vaqueros Pond E-7 Embankment Rehabilitation
	27. Stormwater Management at Meadows Siphon
	28. Canal Liner Rehabilitation and Slope Stability at Milepost 23.03
Delta Diablo Sanitation District	29. Advanced Wastewater Treatment
	30. DDSD Advanced Water Treatment
	31. DDSD Recycled Water Distribution System Expansion
	32. DDSD Salinity Reduction -- Softener Rebate Program
	33. Recycled Water Facility Renewable Energy System
	34. Total Dissolved Solids Reduction/Salinity Management
	35. Wastewater Renewable Energy Enhancement
Diablo Water District	36. Allowable Maximum Level of Demand Project
	37. Beacon West Arsenic Replacement Well
	38. Bethel Island Water Supply Pipeline
	39. High-Efficiency Toilets and Landscape Water Conservation
	40. Phase 3 Well Utilization Project
Diablo Water District	41. Tracy Subbasin Safe Yield Analysis
	42. Treatment of Brackish Groundwater
Diablo Water District/Contra Costa Water District	43. Leak Detection and Repair
East Contra Costa County Habitat Conservancy	44. Watershed and Habitat Protection/Restoration
Ironhouse Sanitary District	45. Ironhouse Sanitary District Recycled Water Implementation – Phase B
	46. Ironhouse Sanitary District Recycled Water Implementation – Phase C
	47. Ironhouse Sanitary District Recycled Water Implementation – Phase A
	48. Oakley Sewers

Table 3-7. Initial List of IRWM Projects (contd.)

Sponsoring Agency / Proponent	Project Title
	49. Salinity Reduction
	50. Septage Receiving Station
Lake Alhambra Property Owners Association	51. Lake Alhambra Sediment Mitigation Antioch Drainage Area 56
Reclamation District 830	52. Jersey Island Cutoff Levees
	53. Jersey Island Levee Raising and Widening from Stations 333+00 to 470+00
	54. Marsh Creek Delta Restoration Project

Key:
BBID = Bryon Bethany Irrigation District
BIMID = Bethel Island Municipal Improvement District
CCWD = Contra Costa Water District
DDSD = Delta Diablo Sanitation District
IRWM = Integrated Regional Water Management

3.4.6. Implementation

As stated previously, this is only an initial list of projects. With the IRWM Web site and Planning Framework established, projects may be added, removed, or updated at any time. With a living process, project proponents and stakeholders now have a venue to collaborate and integrate their projects. Getting a project on the list is important, even if there isn't an imminent funding opportunity. From time to time, the ECWMA and its members may feel it is necessary to have another formal "Call-for-Projects" to refresh their list or to prepare for a new funding opportunity. Although funding is important, it should merely be a reward for good planning. Proper integrated planning should be ongoing, open, transparent, and collaborative. For instance, the ECCC IRWM region recently completed additional planning efforts under the Proposition 84 DWR Round 2 Planning Grant process.

3.5. Technical Analysis

The projects included in this IRWM Plan are intended to provide multiple benefits to both the individual project proponents and the RWMG as a whole. With an understanding of the region's water management issues and objectives, the RWMG was able to identify and develop an initial list of several implementation projects. Each project included in the IRWM Plan has been developed based on analysis of historic and projected data for the individual agencies and overall region, as shown in **Table 3-8**.

In addition to the data and information, several reports, studies, and plans were consulted for information for water management issues, objectives, and projects. Since completion of the region's first IRWM in 2005, the region has continued to invest in regional integrated and coordinated water management planning to the benefit of urban, agricultural, and environmental needs. The updated IRWM Plan increases the opportunity to coordinate and integrate regional planning efforts and should allow the region to more efficiently and effectively accomplish its IRWM goals. The following sections describe recent and ongoing water management planning efforts, including several planning and technical studies conducted in coordination with the IRWM Plan update.

Table 3-8. Data Used in the IRWM Plan

Data	Source
Population and demographic data	2010 Census; 2013 Regional Capacity Study (ongoing)
Hydrologic data	2010 Urban Water Management Plans; Groundwater management plans/Studies.
Water demand information	2010 Urban Water Management Plans; Groundwater management plans/studies; 2013 Regional Capacity Study (ongoing).
Water supply data	2010 Urban Water Management Plans; Groundwater management plans/studies; 2013 Regional Capacity Study (ongoing).
Dry year supply reliability	2010 Urban Water Management Plans (ongoing)
Water quality data	Agency data; Groundwater management plans/studies.
Cost information for potential water management alternatives	Capital Improvement Plans[1]
Recycled water supplies and demands	Recycled water master plans
Groundwater data	Groundwater management plans/studies
Stormwater data	Stormwater master plans
Ecosystem and habitat data	East Contra Costa County Habitat Conservation Plan. Natural Community Conservation Plan
Land-use data	City and County General Plans

Note:
[1] Cities of Antioch, Brentwood, Pittsburg, CCWD, CCFCWCD, DDSD, DWD, and ISD

Key:
CCFCWCD = Contra Costa Flood Control and Water Conservation District
CCWD = Contra Costa Water District
DDSD = Delta Diablo Sanitation District
DWD = Diablo Water District
IRWM = Integrated Regional Water Management
ISD = Ironhouse Sanitary District

3.5.1. Urban Water Management Plans and Studies

Documents that provide information about the Region's water supply outlook and related management strategies include 2010 UWMPs and the ongoing Regional Capacity Study (RCS). These are described below.

The 2010 UWMPs were prepared by each of the region's urban water suppliers with greater than 3,000 connections or that serve 3 TAF annually. In ECCC, these suppliers included CCWD, Antioch, Pittsburg, Brentwood, and DWD. UWMPs are updated every 5 years and include historical water use information and 20-year projections of water demands, water supplies, recycled water use, and a water shortage contingency plan. Additionally, the 2010 UWMPs contained each supplier's water conservation targets to meet the requirements of SB X7-7 requirements of 20 percent water conservation by 2020. Completion of UWMPs is also required by the various DWR grant funding opportunities.

The RCS was initiated in the fall of 2012 and complements IRWM planning efforts. It is a collaborative effort among Cities of Antioch, Brentwood, Martinez, and Pittsburg, CCWD, and DWD. Its purpose is to evaluate and optimize regional untreated water supply, water treatment

plant operations, and delivery processes to improve water supply reliability and reduce the cost of water for urban areas within the region. The RCS is an important element of various ongoing water management planning activities in the region. Its findings will increase the understanding of water management and operations in the region and advance the region's efforts toward achieving the IRWM objectives.

3.5.2. Groundwater Management Plans and Studies

The region is actively managing its groundwater resources through planning and monitoring efforts. Recent groundwater plans and studies providing additional technical data and improving the understanding of groundwater resources in the region are described below.

Two GMPs were completed within the region: the Pittsburg Plain GMP completed by the City of Pittsburg in 2012 and the Tracy Subbasin GMP completed by the DWD in 2007 (these basins can be seen in Chapter 2, Figure 2-10). The Tracy Subbasin GMP was completed in conjunction with the original IRWM. The Pittsburg Plain GMP was completed in parallel with this update. These plans define critical basin management objectives (BMO) necessary to maintain the quality, reliability, and sustainability of groundwater resources on local and regional scales. These BMOs complement the IRWM Plan objectives.

These plans further identify actions and associated implementation plans to achieve the BMOs. Actions that take the form of groundwater studies and monitoring programs will provide additional technical data to support local planning needs and regional planning efforts (i.e., future IRWM updates). The City of Pittsburg and DWD each have implemented groundwater monitoring programs[6] for their respective basins. The City of Pittsburg recently completed a Salt and Nutrient Management Program Summary (developed in parallel with the IRWM Plan Update) to provide a preliminary evaluation of groundwater quality and salt and nutrient loading potential to assist in future groundwater planning and development efforts. DWD recently completed the Tracy Subbasin Data Gap Analysis Report (developed in parallel with the IRWM Plan Update) to identify data needs to determine safe yield of the portion of the Tracy Subbasin underlying the region. These efforts are all considered essential to increase the success of management and protection of groundwater resources in the region.

3.5.3. Recycled Water Plans and Studies

To achieve the IRWM objective of improving the reliability of water supplies, the region is diversifying its water supply portfolio through the use of recycled water. DDSD, ISD, and the City of Brentwood, supply recycled water that offsets potable water use or provides other beneficial uses. These agencies completed studies and projects over the past decade. Past and more recent planning and study efforts contributed technical data used in the IRWM Plan Update. These efforts include the Pittsburg/DDSD Recycled Water Project Facilities Plan (2005), the Antioch/DDSD Recycled Water Project Facilities Plan (2007), the East County Industrial Recycled Water Facilities Plan (2009), the ISD Recycled Water Feasibility Report (being developed in parallel with the IRWM Plan Update), and DDSD Recycled Water Master Plan (being developed in parallel with the IRWM Plan Update).

[6] The City of Pittsburg and DWD participate in DWR's California Statewide Groundwater Elevation Monitoring (CASGEM) Program as designated monitoring entities for the Pittsburg Basin and Tracy Subbasin areas, respectively. The Town of Discovery Bay, ECCID, and the City of Brentwood provide support to DWD.

3.5.4. Stormwater and Flood Management Plans and Studies

The 50-Year Plan "From Channels to Creeks" (2009) was completed by the CCFCWCD. This strategic planning document identifies opportunities and benefits for enhancing storm and flood management systems. Planned enhancements would be to modify these systems to behave more like natural creek systems. The document establishes a framework for long-range planning efforts toward achieving these actions, actions that complement IRWM objectives.

3.5.5. East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan

The ECCC HCP /NCCP is an integral critical source of environmental and habitat technical data that informs the Region's IRWM planning efforts. The HCP/NCCP describes the mission, goals, and objectives for environmental and habitat management in the region, and includes extensive technical data in its appendices, including an aquatic resources inventory, species profile, priority acquisition areas, and urban-wildlife interface design guidelines. The HCP/NCCP establishes regional conservation and development guidelines to protect natural resources while improving and streamlining the permit process for endangered species and wetland regulations. By proactively addressing the region's long-term conservation needs, the HCP/NCCP strengthen local control over land use and provides greater flexibility in meeting water management and other needs in the region.

3.6. Stakeholder Involvement

As noted in previous sections, ECCC's long-standing commitment to collaboration was leveraged in the plan preparation. The region views identifying and involving stakeholders as an important aspect of the local and regional planning processes.

Beyond building a broader water ethic and advocacy for good water stewardship, now and into the future, engagement provides opportunities to gain better insight into potential planning approaches. For example, stakeholders can identify new issues, objectives, or projects others had not previously been aware of, describe the need for projects, discuss the benefits anticipated, solicit feedback from interested and/or affected individuals and agencies, and assist with making decisions. The region seeks to involve others from the early planning stages so that a project, potential concerns and/or opposition can be addressed early, and projects can be planned in a way to minimize negative impacts and maximize benefits. The composition of participating stakeholders has included the members of

Many people have a stake in the ECCC IRWMP, which promotes multi-benefit projects and partnerships. One example of a multi-benefit project is the Dow Wetlands in Pittsburg, set aside as an industrial buffer zone and now dedicated to preservation and student learning. Students from throughout the region have a chance to explore estuaries, freshwater ponds, and grasslands. They can also hike the newly constructed path that links the Antioch Marina to the 471-acre wetland area. This photo is from a California State University summer program.

ECWMA and other interested parties, including:

- Wholesale and retail water purveyors*
- Wastewater agencies*
- Flood management agencies*
- Municipal and county governments and special districts*
- Environmental stewardship organizations*
- State agencies*
- General public
- Community organizations
- DACs
- Small Community Systems

** Active ECWMA members/planning participants*

Outreach was also conducted with industrial and utility stakeholders via interaction of ECWMA members during regularly scheduled meetings of those groups.

Historically, The ECWMA and its members have regularly conducted stakeholder outreach for their various water resources planning and implementation projects. For this IRWM Plan Update, the ECWMA and its members used various methods to identify and reach out to stakeholders. These methods have included the development of a Web site, e-mails, mailings, and public workshops.

3.6.1. ECCC IRWM Region Website

To support the update and outreach of the IRWM Plan, the ECWMA and its members developed a Web site (screen shot shown in **Figure 3-6**). The Web site serves as a portal to disseminate information about the IRWM Plan, the region, the ECWMA, and meeting notices. It also serves as the main tool for collecting project information from member agencies and stakeholders.

Figure 3-6. ECCC IRWM Region Website

The Web site can be viewed at http://www.eccc-irwm.org/, and has the following structure:

- **Home.** Describes IRWM Plan, the region, and lists upcoming opportunities for participation.
- **Member Agencies.** Provides a brief description of each member agency and a link to their Web sites.
- **About IRWM.** Summarizes the IRWM planning process.
- **Schedule.** Presents the current schedule for IRWM updates.
- **Projects**:
    - **About Projects.** States the importance of projects and how submitted project information will be used.
    - **View Map.** Displays the projects submitted and reviewed by an IRWM administrator to date in an interactive map. Clicking on a project displays additional information.
    - **View List.** Displays the projects submitted and reviewed by an IRWM administrator to date in a list. Clicking on a project displays additional information.

  - **Submit New Project.** Upon entering a valid e-mail address, the user will be e-mailed a link to a project submission form. This form can be filled in with project information, saved, revisited, and edited until the user submits the project. After submission, an IRWM administrator will approve the project, after which it will enter the project database and show up in the View Map and View List functions above.

- **Related Documents.** Provides downloads of the region's previous collaborative studies, meeting materials from public meetings, and links to other neighboring IRWM Web sites.

- **Frequently Asked Questions.** Answers common questions.

3.6.2. Stakeholder Outreach Meetings

Three public meetings focused on scoping and crafting the IRWM Plan, were conducted at different stages of the update process and held at various locations to support accessibility to the region's stakeholders and the public. All meetings were advertised on the IRWM Web site, announcements were made in local newsletters, through the Contra Costa County Watershed Forum, and in emails or mailings from agencies to their involved stakeholders. After the meetings, all materials were posted on the IRWM Web site. The Public Workshops held were:

- June 14, 2012, at DDSD – IRWM Plan Kickoff and Call for Projects (see **Figure 3-7**)

  - The kickoff meeting included an introduction of the IRWM Planning process and a demonstration of the Web site and all its features were demonstrated, including how to submit a project.

- September 6, 2012, at the City of Antioch – Progress Update and Final Call for Projects

  - The second public meeting included an orientation for those that missed the first meeting, and an overview of water management issues, regional objectives, RMSs, and the process that will be used for prioritizing projects.

- May 14, 2013, at the City of Pittsburg – Presentation of the Public Draft IRWM Plan Update 2013

  - This third public meeting presented the Public Draft IRWM Plan Update 2013 and allowed stakeholders the opportunity to provide their comments.

In addition to Public Workshops, six additional semi-regular phone-web working meetings were conducted with key stakeholders to review and provide input to specific sections of plan text. These meetings were open to attendance by any interested party, and email invitations were sent to the entire interested party list. These 2013 sessions occurred: January 8; January17; January 25; March 15; April 8; and April 26.

Altogether 20 different stakeholders were engaged in the early public meetings with 12 new participants joining as the planning progressed. All interested parties were routinely advised by email of work sessions and other opportunities for participation. All interested groups have been

welcome to participate in discussions, project submissions and for providing comment in both the drafting and public comment stages of plan development.

Since the May 14, 2013 Public Workshop, member agencies of ECWMA have shared the document with their own stakeholders and each will conclude the process with a public meeting adoption of the plan.

Figure 3-7. ECCC IRWM Region Stakeholder Outreach Meeting in June 2012

3.6.3. Stakeholder Outreach During Implementation

As the IRWM Plan is implemented, stakeholders throughout the region will be involved in decision making and encouraged to provide feedback. The precise mechanism for stakeholder involvement will be determined based on the needs of an individual project or program being implemented. However, mechanisms for involving stakeholders and encouraging feedback are anticipated to include the following, as appropriate:

- Updates on the IRWM Web site to provide information on the status and progress of projects being implemented and other upcoming events or grant funding opportunities.

- Public forums, workshops, and meetings in which stakeholders are kept apprised of project progress and status, and are encouraged to provide feedback.

- Speakers Bureau composed of ECWMA representatives available to present at the meetings and convenings of related groups.

3.6.4. Outreach to Disadvantaged Communities

As outlined throughout this document, the region, like the State of California, is committed to promoting equitable distribution of project benefits, and especially to addressing the critical water supply needs of underprivileged areas. Section 2.43 addresses the significance of this community to the regional and outreach efforts undertaken to ensure representation.

3.6.5. Native American Tribal Communities

Because benefit to Native American tribal communities is included as a DWR IRWMP project scoring criterion, the team closely assessed the best way to achieve compliance. The team reviewed DWR and other tribal maps and conducted a summary scan of ECCC historic literature. After this review, it was determined there are no tribal communities currently residing in the ECCC region. However, there is a rich history of Native American occupation in ECCC, including the Kellogg Creek National Historic District located on the Los Vaqueros watershed.
A future IRWMP proposal may include something benefiting tribal communities; for example, enhancement of habitat suitable for plants that may be used for cultural purposes. If project opportunities are identified, outreach is anticipated to organizations such as California State Parks, the State Historic Preservation Officer, the California Indian Heritage Center (CIHC) and the CIHC Foundation and the Native American Heritage Commission. Additional outreach may also be conducted with the basket weaving community, through the California Indian Basketweavers Association.

3.6.6. Process to Ensure Authentic Engagement

Chapter 2, Section 2.3 more fully describes decision making within the ECCC IRWM Plan process and Chapter 4, Section 4.1, also addresses governance. The ECWMA, as the RWMG, is a formal body directed by a wide range of agencies. That said, and while provisions for voting are provided, the body is largely consensus driven with participants seeking to find wide agreement on plan approaches, priorities and projects. The opinions, suggestions and requests of all stakeholders are given the highest consideration and managed in an open and transparent way. All parties with an interest have been included in deliberations.

With the development of the IRWM Web site, the establishment of the planning framework, and the various outreach activities, stakeholders may continue to be identified and added to the IRWM planning and implementation process. By being open with information and providing various venues, the ECWMA and its members are hoping to provide greater benefits to the region, while also

The Big Break Regional Trail, operated by East Bay Regional Parks runs through the Ironhouse Sanitary District. It is operated using integrated resource management. Not long ago, this culvert was thick with blackberries. To bring it back to a wetland state, the channel was graded, letting water in from the delta. Shorebirds found the wetland the very next day. Visitors on the trail can see tule and cattails and even small fish. The trail connects to the northern end of the Marsh Creek Regional Trail, providing access to Brentwood and Oakley. The Marsh Creek Regional Trail connects to the Delta de Anza Regional Trail. Often, simple, low-budget restorations can achieve multiple benefits. For example, this new habitat is also more resilient in floods and storms.

keeping up with all of the region's water management issues, priorities, needs, and objectives.

3.7. Integration and Coordination

3.7.1. Opportunities for Integration and Coordination

DWR, by promoting integrated regional water management, encourages local water resources managers to cooperate, coordinate, and, where possible, integrate the strategies, projects, and programs they implement. This approach has encouraged water resources managers to think outside their immediate political boundaries, watershed, or primary water management responsibility. With an understanding that water should be managed as ONE resource, water suppliers, wastewater, flood and stormwater, watershed and environmental resources managers, community organizations, and other interests have a real stake in IRWM planning. There are several ways in which the IRWM is providing the venue for integration to occur. The ways include:

- Regular meetings during the development of the update of the IRWM Plan and ongoing implementation activities.

- The IRWM Web site, which provides the opportunities for project proponents to upload, update, and review project information. Users are also kept apprised of other happenings, including upcoming and past meetings. The project information is important in that it may introduce an issue or solution that others had not thought of and it also shows the many capabilities and interest of those in the region.

- Existing relationships among ECWMA members. There may already be existing agreements, authorities, organizations, or programs, in which the ECWMA are partnering together. These relationships would support and fit under the umbrella of the IRWM Program.

There are many ways in which project proponents may collaborate and integrate their projects, including project funding, in-kind labor, sharing of other resources, statements of support, or joint outreach.

3.7.2. Existing Agency Relationships

The members of the ECWMA have strong working relationships and often work together to solve regional water management issues. The original ECWMA was formed in 1995 and expired in 1996, then was re-constituted in March 1997, and amended in 2010 to update some agency names, add East Contra Costa County Habitat Conservancy as a new member, include language about the IRWM Plan in the purpose statement and make a few other conforming changes. A copy of these documents is contained in (**Appendix H**).

The Delta Diablo Sanitation District is a leader in working with others on water recycling.

The agencies work together in a number of ways, including through water supply agreements, recycled water collaborations, shared treatment facilities, participation in regional organizations, and collective efforts to strengthen regional water resources.

3.7.3. Water Supply Agreements

CCWD provides wholesale treated water to the City of Antioch, the GSWC in Bay Point, DWD in Oakley, and the City of Brentwood. CCWD sells untreated water to the ECCC Cities of Antioch and Pittsburg, as well as to industrial and irrigation customers. According to CCWD's 2010 UWMP, CCWD wholesaled 58,020 AF (adjusted to account for drought and economy) in 2010 and is projected to wholesale 82,200 AF by 2035. CCWD also has an agreement with ECCID to purchase surplus irrigation water to be used for M&I purposes in ECCID's service area.

3.7.4. Recycled Water

Recycled water is becoming more of a resource in the Region. The region recognizes the value of recycled water as a reliable, drought-proof supply. Agencies within the region plan to continue development of recycled water projects to help meet water needs, and will also evaluate expanding recycled water use more regionally.

In 2000, DDSD and CCWD entered into an agreement for DDSD to provide up to 8,600 AF/year of tertiary treated recycled water to the DEC and the LMEC. Treated wastewater from DDSD is used for turbine cooling at the energy facilities. This project is one of the largest industrial recycled water projects in California. In 2004, DDSD and CCWD reached a General Agreement for DDSD to supply up to 1,654 AF/year of recycled water for urban landscape and golf course irrigation in Pittsburg and Antioch.

In 2004, DDSD and CCWD executed general recycled water agreements whereby both districts can develop a joint project or each district can develop its own individual project(s) by cooperating with the other agency in planning, design, and construction activities. The agreements are intended to address and resolve legal issues, namely duplication of service, arising from the purveying of recycled water by a sanitation district in CCWD's service area.

CCWD, DDSD, ISD, Pittsburg, Antioch, PG&E, Mirant Corporation, and Central Contra Costa Sanitary District prepared the ECCC Regional Industrial Recycled Water Facilities Plan in 2009. The purpose of this plan was to evaluate the feasibility of implementing regional industrial recycled water projects in the Pittsburg/Antioch industrial corridor.

City of Brentwood Water Treatment Plant.

Most recently in November 2012, the region was award a Proposition 84 DWR Round 2 Planning Grant, which included funding for expanded regional recycled water planning. The work would continue to develop recycled water planning to better define the regional recycled water setting, better develop potential projects for implementation through the IRWM process, and help the ECWMA meet it

objectives. The work would involve coordination of DDSD Recycled Water Master Plan and ISD's Recycled Water Feasibility Study. The wastewater agencies would participate in monthly conference calls to:

- Identify and develop recycled water projects
- Discuss opportunities for regional efficiency
- Discuss stakeholder and DAC outreach strategies and lessons learned
- Discuss regulatory aspects
- Discuss implementation challenges

Shared Facilities

In addition to providing descriptions of individual agencies, Chapter 2, provides a history of joint planning efforts and a discussion of shared facilities such as the RBWTP. DWD and CCWD jointly own the RBWTP, which is operated and maintained by CCWD. In 2004, CCWD and the City of Brentwood entered into an agreement for the design, construction and operation of the City of Brentwood Water Treatment Plant (COBWTP), adjacent to the RBWTP. The COBWTP and the RBWTP share facilities, which are either independently owned by CCWD or by the RBWTP under a Joint Powers Agreement. The Joint Powers Agreement includes ECCC and the cities of Antioch, Brentwood, and Oakley.

3.7.5. Organization Memberships

Beyond the ECWMA, many of the members of the ECWMA also belong to and participate in other water and environmental organizations together.

The ECCC Habitat Conservation Plan Association (HCPA) is a joint powers authority consisting of the following seven members: ECCC, Brentwood, Clayton, Oakley, Pittsburg, CCWD, and East Bay Regional Park District. The HCPA was established in June 2000, to oversee development of an HCP for ECCC. The HCPA is responsible for drafting the plan for submittal to the governing boards and councils of member agencies, as well as overseeing compliance with the CEQA and NEPA. This represents a major regional planning effort aimed at preserving and enhancing native habitats that support endangered and sensitive species while providing a regional incidental take permit under the federal ESA and CESA.

The Cities of Brentwood and Pittsburg, and the CCWD, are members of the California Urban Water Conservation Council (CUWCC). The CUWCC strives to integrate urban water conservation Best Management Practices (BMP) into

The ECWMA agencies use a range of tools and best practices to address water concerns. Simple tools, like rain barrels, are promoted on the CCWD Web site. Rain barrels can help conserve outdoor irrigation water and reduce the impacts of stormwater runoff.

the planning and management of California's water resources through development of statewide partnerships among urban water agencies, public interest organizations, and private entities.

Contra Costa Flood Control District, Contra Costa County, and the Cities of Brentwood, Antioch, and Pittsburg are all participating members of the Contra Costa Clean Water Program (CCCWP). The CCCWP facilitates the NPDES stormwater permit for Contra Costa County and organizes activities on a program level to implement best management practices to protect waterways from pollution. The CCCWP assists all municipalities within Contra Costa to come into compliance with their mandated stormwater permit issued by the regional water boards (under the California Environmental Protection Act).

3.7.6. Regional Planning Efforts

The ECWMA and its members also participate in several regional planning efforts.

Regional Capacity Study

CCWD, Antioch, Pittsburg, DWD, Brentwood, and the City of Martinez are completing a RCS. The RCS is partially funded through a Reclamation System Optimization Review grant and the Proposition 84 Round 2 Planning Grant. The study is to determine how best to optimize water supplies and facilities for the region. The RCS will evaluate and optimize regional water treatment plant operations, untreated water supply and delivery processes to improve water supply reliability and reduce the cost of water treatment for the project participants in the ECCC region. Recycled water focus groups will help gather information, such as potential opportunities for recycled water use. The study is scheduled for completion in 2013.

Regional Conservation Program

A regional alliance was created to meet SB X7-7, the Water Conservation Act of 2009, which set a goal for water agency's to have 20 percent water conservation by 2020 requirements. The regional alliance is led by CCWD and includes CCWD's retail service area and its wholesale municipal customers–the Cities of Antioch, Pittsburg, and Martinez, the GSWC, and DWD. Each agency will meet the requirements of SBx7-7 if it achieves the reductions on its own, or if the region meets the requirement as a whole.

Related to the regional alliance is CCWD's Water Conservation Program designed to achieve reductions in long-term water demand in an environmentally responsible and cost-effective manner. As a wholesaler, CCWD develops and implements this regional conservation program on behalf of its retail water agencies and their customers. This regional approach enables economies of scale, ensures a consistent message to the public, and assists in the acquisition of grant funding for program implementation.

Western Recycled Water Coalition

Since 2006, DDSD has served as the lead agency for the Bay Area Recycled Water Coalition, a regional partnership of agencies seeking Federal funding to develop recycled water projects. Coalition members prepare Feasibility Studies under the Title XVI Program (the Reclamation Wastewater and Groundwater Study and Facilities Act). In 2013, membership was opened to interested agencies across the State, and the name was changed to the Western Recycled Water Coalition. There are currently 22 member agencies, which include ECCC members DDSD, ISD, and the City of Brentwood.

Water Forum

To foster collaboration among agencies and share information across watersheds, the Contra Costa County Flood Control District worked with partner agencies and organizations to establish the Contra Costa Watershed Forum, which brings together a variety of groups and individuals monthly to address watershed issues in Contra Costa County. The forum provides a vehicle to advance integrated watershed planning initiatives and projects that achieve multiple objectives from water supply and water quality protection to flood management and ecosystem restoration.

3.7.7. Neighboring IRWM efforts

Overlapping Regions

As discussed in previous document sections, the northwestern portion of the ECCC IRWM region overlaps with the Bay Area IRWM region. The overlapping area includes the community of Bay Point and most of the City of Pittsburg. This overlap arises from the location of the San Francisco Funding Area boundary (contiguous with the Bay Area IRWM region boundary), which has been aligned with the San Francisco Bay Water Board (Region 2) boundary in this area. The ECCC IRWM region boundary in this area is based on the hydrologic divide created by the Mount Diablo ridgeline. Two watersheds that drain to the east of the Mount Diablo hydrologic divide (Willow Creek and Kirker Creek) are included the San Francisco Bay Water Board Region 2 boundary and thus were also included within the Bay Area IRWM region.

To confirm that there is no duplicative planning for regional water resource management issues in these watersheds, the ECCC IRWM region and the San Francisco Bay Area IRWM region collaborate to identify and prioritize any project that would be located in the overlap area. As mutually agreed to by the parties in March 2009, specific projects identified through this collaboration will only be included in funding proposals for a single funding region. Additionally, several members of the ECCC region participate as needed in the Bay Area IRWMP meetings.

Despite this overlap, the ECCC region has distinct water management differences from the Bay Area that justify preserving a separate IRWM region. The shared geographic, environmental, and water resource conditions combined with an established successful history of coordinating planning and implementation of water resources projects distinguishes the ECCC area as a logical unit for continued, contiguous regional planning efforts.

Adjacent IRWM Regions

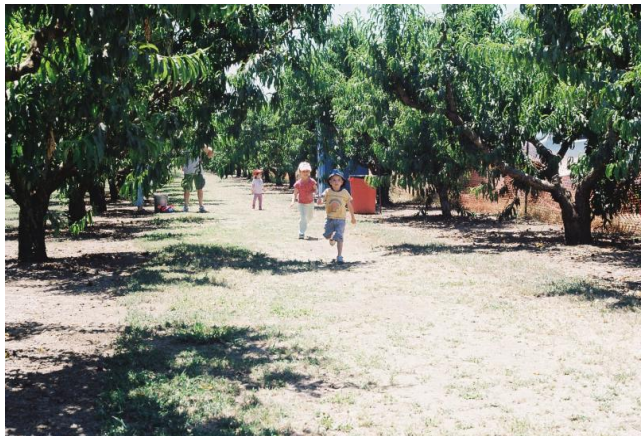
The ECCC IRWM region is geographically adjacent to only two other IRWM regions, the Eastern San Joaquin IRWM region to the east and the Westside (Sacramento Valley) IRWM region to the north. The Westside IRWM region is in the Sacramento River Funding Area and is located on the north of the Delta. The East San Joaquin IRWM region is located in the San Joaquin Valley and its current primary water management focus is the underlying groundwater basin, specifically the Eastern San Joaquin and Consumes groundwater subbasins, which are separate and distinct from ECCC's groundwater basins. There does not seem to be any obvious connections between the ECCC IRWM region and these neighboring regions. The ECWMA will monitor the progress of these IRWM regions and coordinate if the opportunity presents itself. There are also links to these IRWM regions' Web sites on the ECCC Web site (http://www.eccc-irwm.com/related.html).

Interregional Relationships

The dominant interregional water management issues for the ECCC IRWM region are related to protecting the multiple beneficial uses of the Delta. ECCC IRWM region stakeholders have a long history of working collaboratively in a comprehensive manner on Delta issues. ECWMA member agencies have been actively involved in broad Delta planning processes including CALFED, the Delta Risk Management Study, development of a Central Valley Drinking Water Policy, Delta Vision process, as well as project-related stakeholder processes for projects such as San Luis Drain, Sacramento Regional WWTP, BDCP and Frank's Tract Two Gate project. Through these processes, participants and stakeholders have exchanged information, built understanding, developed relationships, and worked to find mutually beneficial solutions to water management issues and avoid conflict (with varying degrees of success). Having these relationships and participating in Delta interregional planning processes ensures that while the ECCC IRWM region remains distinct, it is not isolated.

3.7.8. State Agency Assistance

The ECWMA and its members coordinate with State and Federal agencies to gain assistance and support in implementation. DWR and the Water Boards have always been invited to IRWM meetings for their input and guidance. The Region has a long standing working relationship with the State in implementing various projects, most recently through grants from Propositions 1E, 50, and 84. Also, all projects will need to go through the proper CEQA/NEPA documentation process before construction or completion, which requires a certain amount of coordination and consultation with State and Federal agencies. As different types are projects are implemented, the ECCC IRWM Plan will work and coordinate with State and Federal agencies, where appropriate.



Many ECCC families enjoy visiting local orchards to pick their own fruit. Agriculture remains an important part of the region. With rich Delta soils, ideal growing weather and a good water supply, areas like Brentwood have grown fresh food for the Bay Area since the Gold Rush days.

Local farms provide more than food. In addition to food sales, agricultural tourism supports the local economy. The agricultural community also provides green jobs, open space and a connection to the history of the region.

In recent years farm land has been lost to urban development; however ECCC still has significant acreage of prime, irrigated farmland. This important land use must be considered in planning the region's water future.

3.7.9. Relation to Local Water Planning

The IRWM Plan serves as a unifying document of regional objectives and projects, but it is not meant to supersede the autonomy or authority of a local agency. The IRWM Plan incorporates and is consistent with all local water planning documents including UWMPs, water master plans, GMPs, recycled water master plans, habitat conservation plans, stormwater management plans, and other water resources plans and studies. As local water planning is updated, the ECWMA may also update the IRWM plan, in recognition that the plan is a living document and information and circumstances

evolve. Conversely, local planning should also be consistent with the findings and results of the IRWM Plan. With a wide ranging membership on the ECWMA, achieving this consistency will be less onerous than in situations where the parties are less accustomed to working together.

3.7.10. Relation to Local Land-Use Planning

Land-use planning can often be improved by a careful review of the linkages between land use and development decisions and water supply availability and reliability. The availability of water supplies, protection of water resource features such as streams, wetlands and recharge areas, and policies and regulations about water quality, drainage, and flooding all play a role in future development.

Significant assessment of land use was conducted during the 2005-6 preparation of the ECCC HCP/NCCP. A review of this assessment may be found in Chapter 2, Land Use and Covered Activities, of the HCP/NCCP. Some significant considerations of the plan that relate to the IRWM plan include findings regarding general land-use patterns and designations, potential conflicts.

According to the HCP/NCCP, until the mid-1980s, much of the growth in Contra Costa County was concentrated in the western and central communities along the shoreline and along the I-680 corridor. When those communities began to reach their boundaries, development pressure increased on the eastern portion of Contra Costa County. As a result, the Eastern County experienced rapid residential growth during the mid1980s, particularly in Pittsburg, Antioch, Brentwood, and Oakley along the corridor of State Route (SR) 4. The Eastern County continued to develop rapidly throughout the 1990s and is expected to be the fastest growing area of the County for the foreseeable future.

The City of Brentwood experienced the most significant increase (152 percent) making it, for a time, the fastest growing city in the United States. Much the early urban development in ECCC involved converting crop, grazing, or irrigated pasture lands into residential and other urban uses (Contra Costa County, 2005). These lands are highly desirable for housing development as they are typically flat, which makes building easier, and often have some infrastructure already in place. Agricultural land conversion can have a major impact on water planning. This extends beyond water supply to flood and stormwater management, to water quality and groundwater considerations.

Many became concerned about the rapid changes to the landscape. Contra Costa County votes adopted Measure C in 1990 to put the brakes on. The measure established a Land Preservation Standard, which limited urban development while preserving land for open space, agriculture, parks, wetlands, and other nonurban uses. Measure C also created an Urban Limit Line (ULL), which prohibits the County from approving urban land uses beyond the ULL (Contra Costa County, 2005)." Over time the ULL standard has been amended by the County and different ECCC local governments moved forward with varying approaches to growth

Today, general patterns of land-use designations in ECCC begin with northern focus. That area is primarily designated for development. The remainder of land is primarily designated as agricultural land, open space, and parks.

Housing is the major form of development projected to occur in the growth areas. Development trends for the inventory area include the buildout of southern Pittsburg, southern Antioch, and southern and eastern Clayton; the urbanization of Brentwood and Oakley; development of the Cypress Road Corridor east of Oakley, development of Discovery Bay West adjacent to the existing Discovery Bay; and development between the already urbanized cores of Antioch, Brentwood, and Oakley.

With the economy beginning to recover, new housing is starting to be constructed in ECCC.

The unincorporated areas of ECCC are primarily rural agricultural and public lands used principally for grazing, natural parks, and watershed protection.

Water resource planning efforts in the region must take into consideration land-use plans identified in the HCP/NCCP and general plans for each city and the county. Land-use planning projections provide the basis for establishing water supply projections and identifying habitat areas that will need to be protected against impacts associated with urban development. Land-use plans will continue to play an important role in developing effective projects to meet the objectives of the region.

3.8. Future IRWM Plan Updates

In preparing this plan, the ECCC region seeks to establish a strong foundation for future planning and implementation activities. The latest IRWM Guidelines were followed and all requirements were met.

IRWM plans do not have regular update schedules as do UWMPs, which must be updated every 5 years. The living document process adopted by the ECWMA makes the process of updating more routine. At some point, a formal update, taking into account major new information or a changing situation, will be called for and the ECWMA will determine the appropriate time. Circumstances trigger this situation may include:

- New IRWM Guidelines or requirements
- New stakeholders or participants
- A need to change to the region's boundary, such as contraction, expansion, or consolidation with another region

- Significant environmental changes or other catastrophic events

- Significant updates to local water planning or local land-use planning, such as the completion of planning efforts soon to be underway associated with the Proposition 84 DWR Round 2 Planning Grant awarded to the region in late 2012.

Barring significant changed circumstances, the region anticipates using the IRWMP well into this decade. The planning framework allows for results and outcomes of future planning efforts, such as the upcoming Proposition 84 DWR Round 2 Planning Grant effort, to be seamlessly incorporated into the IRWM Plan. The ECWMA also has established procedures to allow suggestions to be brought forward for change.

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Chapter 4. IRWM Plan Implementation

The ECCC IRWM participating agencies work together across geographies, political boundaries, and project types. Each agency also continues to invest in its own planning efforts. These various efforts are highlighted in **Table 4-1**. Consistent with past regional planning efforts, this update does not aim to duplicate efforts of local agencies and regional partnerships. This regional plan complements those efforts. It provides a venue for regional coordination, collaboration, outreach, and identification of projects and actions that will create mutually beneficial water management outcomes and produce projects with multiple benefits to the region. This section discusses implementation elements important to advancing these projects and actions. Implementation elements discussed include plan and project financing, performance monitoring, data management, impacts and benefits of plan projects and actions, and plans and general processes for updating the IRWM Plan in the future.

Table 4-1. ECCC Region - Progress on Planning Efforts Since 2005 IRWM

Regional integrated and coordinated water management planning since completing the ECCC IRWM Plan in 2005:

- Regional Acceptance Process was completed in 2009. Approved by DWR
- 2010 UWMP Updates (Antioch, Pittsburg, Brentwood, CCWD, DWD, GSWC – Bay Point) and various related water conservation plans, programs, and projects
- Regional-scale water supply optimization planning (municipal water purveyors)
- Regional water recycling and desalination planning (DDSD, ISD)
- Groundwater management plans, CASGEM plans, and salinity/nutrient management planning (DWD, Pittsburg)
- Regional habitat conservation planning and implementation (ECCCHC)
- Long-range regional flood management planning (CCCFCWCD)
- Active participant in integrated regional water management grant programs (all ECWMA member agencies)
- Improved outreach, collaboration, and communication (all ECWMA member agencies)

Key:
CCCFCWCD = Contra Costa County Flood Control & Water Conservation District
CCWD = Contra Costa Water District
DDSD = Delta Diablo Sanitation District
DWD = Diablo Water District
ECCCHC = East Contra Costa County Habitat Conservancy
ECWMA = East County Water Management Association
GSWC = Golden State Water Company
ISD = Ironhouse Sanitary District

4.1. Governance

The ECWMA is governed and operated by the GBRs, composed of one elected official representative from each of the member agencies. Member agency governing boards and councils appoint their representatives and an alternate and set the parameters for their participation. The GBR is responsible for providing policy guidance for ECWMA activities. Each member agency has one vote on the GBR, and all actions of the ECWMA require a majority vote. The GBR appoints one of its members as chair and one as vice-chair. The term of office for these appointments is 2 years. The GBR meets at least twice a year, and the meetings

are open to the public, noticed, and conducted in accordance with the Brown Act, Government Code Section 54950 et seq. In addition, the chair or any three members of the GBR may call a special meeting.

The CCWD has served as the lead agency responsible for submitting any IRWM grant materials on behalf of the ECCC region. CCWD has been serving as the lead agency for the ECCC region in accordance with a February 25, 2005, letter agreement signed by all of the ECWMA member agencies.

4.1.1. Introduction

The ECWMA governance structure was originally established by a 1997 agreement between member agencies, and later amended in 2010 to update agency membership and language based on new 2010 DWR IRWMP Guidelines. The ECWMA facilitates communication and cooperation between member agencies on matters affecting the existing and potential water supplies of the ECCC region. The ECWMA also guides the preparation of plans such as the IRWM Plan Update. The GBR is responsible for setting policy guidance for ECWMA activities. Each of the member agencies are equal partners with equal voting rights. All actions undertaken by the ECWMA require a majority vote. The JMC is composed of managers from each of the member agencies. The term "manager" means City Manager, County Administrator, or General Manager of each of the member agencies and their respective alternates designated by the member agency, or their desingees. The JMC can appoint subcommittees related to specific water management activities that the members of the ECWMA are involved in. The ECWMA, through the staff assigned to RWMG has a proven history of working together to resolve water management-related issues within the ECCC region. The RWMG successfully implemented a State Water Board Proposition 50 IRWM implementation grant that was completed in 2012. In addition, the ECWMA received DWR approval for the Regional Acceptance Process in 2009. The RWMG staff is familiar with the DWR IRWM planning and implementation grants process and has been working together on a variety of projects since 1997.

4.1.2. Regional Water Management Group Governance Structure

Management and Operations

Over the past several years staff of the JMC has served as the ECCC IRWM RWMG working on ECCC reports, plans, and IRWM implementation and planning grants. CCWD has served as the authorized agency submitting grant applications, entering into grant agreements, and administering IRWM grants for the ECWMA. However, each agency has, been responsible for implementing its own projects that have received state funding as part of an IRWM grant request.

Staffing

Each participating entity designates staff to attend meetings and work together on implementation and planning grants. CCWD holds a primary role to organize meetings among the designated RWMG members as needs arise. For example, in 2011 through 2013 RWMG members meet frequently to discuss the 2013 IRWM Plan update as well as to seek approval for projects to be included in Proposition 84 planning and implementation grant applications. Consulting staff have been used by the group to prepare grant materials. Over the years the group has used RMC and MWH to support grant activities.

Committees

Generally the RWMG staff members work collectively on IRWM grant requests of interest. CCWD serves as the grant administrator and generally has contracted for consultant services to support grant applications. Members of the RWMG have formed subcommittees to manage groundwater studies, salt and nutrient management studies, and recycled water studies. CCWD and Contra Costa County Flood Control District staff are involved with the Bay Area IRWM and attend Bay Area Coordinating Committee meetings. CCWD and Contra Costa County Flood Control District staff have also worked closely with the Bay Area IRWM region to vet projects and address overlap concerns.

Communications

Staff from the RWMG encourages open and new participation within the ECWMA. Meeting minutes generally are taken after the RWMB meetings. Staff from the RWMB routinely works together on a variety of planning and implementation projects that require frequent and regular communication. Meeting and communicating on a frequent basis affords the opportunity to create synergies across agencies and across potential projects. In 2012, a new Web site was created to facilitate improved communication among the agencies, stakeholders in the community, and interested parties, such as adjacent IRWM regions. (http://www.eccc-irwm.org/index.html).

4.2. Projects for Plan Implementation

The ECCC IRWM region is almost entirely dependent on the Delta for water supply and all or a portion of the cities and unincorporated communities are located within the statutory Delta. This distinction is important as the Delta is a physical place with legally defined boundaries and requirements, which add to ECCC water management complexity. Substantial investments have been made in the region in water storage and water quality by constructing the expanded Los Vaqueros Reservoir, improving and expanding intakes, developing recycled water systems, and planning for coordinating conjunctive management of surface water and groundwater supplies. Even so, regional dependence on Delta water supplies is a continuing concern for the following reasons:

- Issues associated with proposed future projects such as the BDCP, a fragile Delta ecosystem, climate change, and/or potential levee failure are expected to impact water quality and water supply reliability within the ECCC IRWM region. An associated concern is the ability of the region to meet future water quality treatment and discharge regulations.

- Closely linked to Delta water quality and water supply reliability is protection, restoration, and enhancement of the Delta ecosystem and other environmental resources. Water-infrastructure-related projects within the Delta often require wetland mitigation and these credits can be difficult and costly to obtain.

- Given that the ECCC IRWM region includes substantial low-elevation acreage, is within the drainage of Mount Diablo, and sits adjacent to the Delta, both localized flood from stormwater runoff and regional/catastrophic flooding due to levee failure are real and present threats. Of the past 11 president-declared natural disasters in the region, all but one involved storms and flooding. Climate change is only likely to increase these risks.

- Outreach to discuss these water-related issues, and how they may be addressed, is a challenge for all communities. ECCC has additional challenges; the DACs (23 percent of the population) are not concentrated in one area. The DACS are spread across urban centers and rural areas. There isn't a strong existing information distribution network that targets these stakeholders, and thus extra effort needs to be made to communicate with representatives from these areas.

With an understanding of these water management challenges, the RWMG and its members had the necessary information to set its objectives (presented in Chapter 3) for the IRWM Plan. This set of objectives, when combined, addresses the region's priority water management issues of water supply and quality, environmental concerns, storm and flood management, and outreach and equitable distribution of resources. To determine what projects and actions are required to meet these objectives, the RWMG collected and disseminated information, met with stakeholders, and developed and implemented an evaluation and prioritization process. The final result of this process is a suite of priority projects that, when implemented, will help the region to meet its objectives. This plan identifies 54 projects for consideration (see **Appendix E**). Each project has an identified lead agency, and has been demonstrated to be economically and technically feasible.

Table 4-2 and **Figure 4-1** list the projects identified for near-term implementation. This list of projects addresses IRWM Plan objectives, provides multiple regional benefits, has broad stakeholder support, and is implementation ready.

Table 4-2. Proposition 84 Round 2 Implementation Project List

(From Table 8 – Summary Budget (from PSP) Proposal Title: East Contra Costa County Region Proposition 84 Round 2 Grant Proposal)						
		(a)	(b)	(c)	(d)	(e)
	Individual Project Title	**Requested Grant Amount**	**Cost Share: Non-State Fund Source**	**Cost Share: Other State Fund Source**	**Total Cost**	**% Funding Match**
(a)	Beacon West Arsenic Well & Tank Replacement Project	$136,262	$0	$0	$136,262	0%
(b)	Rossmoor Well Replacement/Groundwater Monitoring Well System Expansion Project	$430,000	$917,200	$0	$1,347,200	68%
(c)	Integrated Regional Flood Protection and Water Quality Improvement Borrow Area Project	$675,000	$803,587	$0	$1,478,587	54%
(d)	Knightsen Wetland Restoration and Flood Protection Project	$500,000	$4,958,750	$0	$5,458,750	91%
(e)	Recycled Water Salinity Reduction and Distribution System Expansion Project	$1,500,000	$1,500,000	$0	$3,000,000	50%
(f)	East Contra Costa County Prop 84 Round 2 Grant Administration	$149,984	$0	$0	$149,984	0%
(i)	Proposal Total (Sum rows (a) through (h) for each column)	$3,391,246	$8,179,537	$0	$11,570,783	71%
(j)	DAC Funding Match Waiver Total				$136,262	0%
(k)	Grand Total	$3,391,246	$8,179,537	$0	$11,434,521	72%

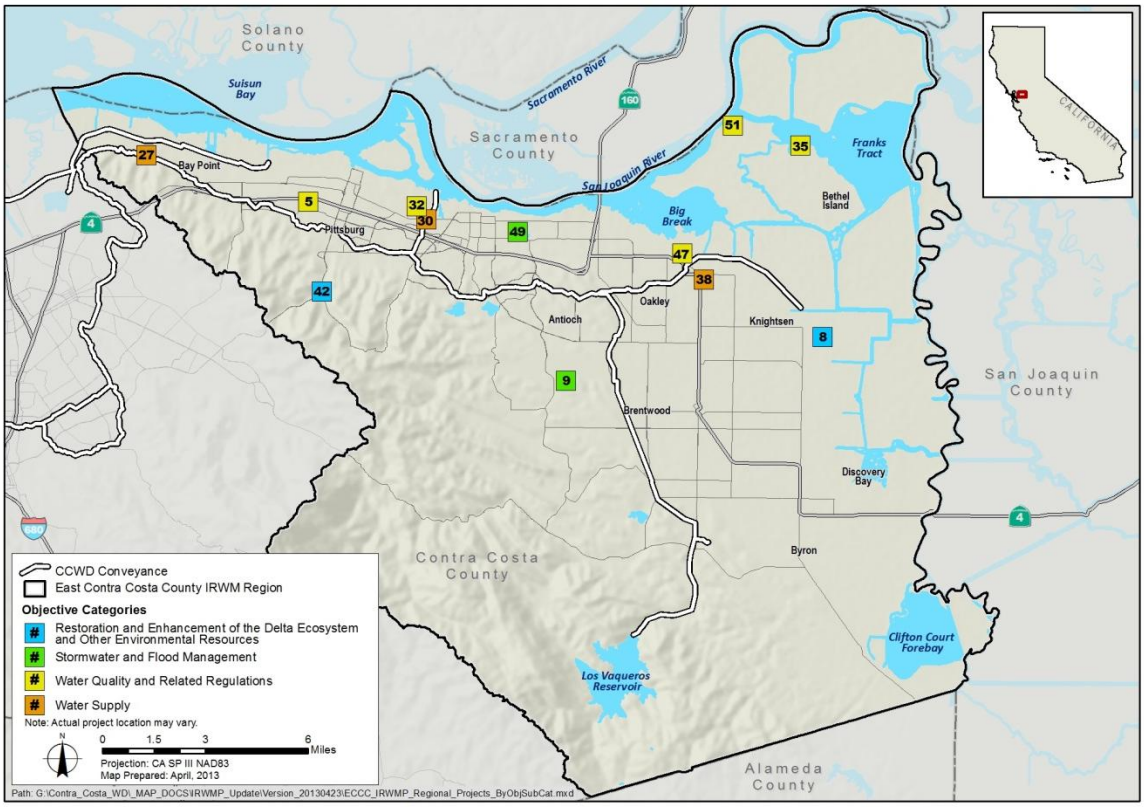

Figure 4-1. Proposition 84 Round 2 Implementation Projects by Objective Category

4.3. Potential Benefits of IRWM Plan Implementation

By their nature, IRWM plans are implemented through projects. Those projects are designed to produce benefits but may also have impacts to the region. Benefits and impacts need to be documented in more detail to meet the required environmental compliance laws, such as the CEQA and NEPA, or other local, State, or Federal permits. The region identified multiple benefits from achieving its objectives. Key benefits are tied directly to the five plan objectives.

4.3.1. Water Supply and Water Quality

Projects that provide reliable water supply are essential to future viability of all aspects of the region's environment, economy, and culture. Additionally, because the regional supply is tied to the Delta, projects to reduce Delta influences and anticipate climate change impacts, such as drought and extreme weather, will greatly increase the region's resilience and ability to adapt to changing conditions. Water supply and quality are linked as improving and maintaining water quality contributes to supply (for humans and the environment) and is a critical factor in cost. Benefits associated with water supply projects or water quality projects (or both) determine what water may be available for appropriate uses. Specific projects proposed to achieve reliable supply and quality aim to provide the following benefits:

Pursue water supplies that are less subject to Delta influences and drought, such as recycled water and desalination:

These projects will seek to increase access to desalination water as well as other alternative water supplies, such as recycled water and groundwater sources, which would not be impacted by levee breaches, a problem that severely affects Delta water quality, and reduce the use of Delta water supplies, an important regional and statewide goal. Also, by increasing the water quality of currently recycled water, the industrial and irrigation uses of this water supply can be expanded further, contributing to the aforementioned benefits. Providing a drought-tolerant supply that is less subject to Delta influences is a critical goal for the region.

Reduce per capita consumption through increases in water conservation and water use efficiency

The benefits from projects that reduce per capita water consumption include reducing demand for treated drinking water through increased recycled water use, improved treatment plant water-use efficiency, and by minimizing leaks and water loss due to root damage from trees and vegetation, damaged concrete liners, and repairable system and customer leakages.

Increase water transfers and regional interties

The projects that increase water transfers and regional interties will benefit the region by increasing regional water sharing, while also decreasing leaks and water losses, which will increase the efficiency of water distributed within the system.

Pursue regional exchanges for emergencies, ideally using existing infrastructure

The main benefits provided by the projects fulfilling this objective is to minimize the amount of salt water intrusion into the drinking water supply, particularly in the event of a levee failure on Jersey Island and to provide interconnection redundancy for existing pipelines.

Enhance understanding of how groundwater fits into the water portfolio and investigate groundwater as a regional source (e.g., conjunctive use)

Projects studying regional groundwater will benefit the region by improving how groundwater is managed, reducing Delta water use and threats to groundwater quality. In addition, these projects will identify subbasin yield, and areas with contamination (i.e., high arsenic levels).

Protect/improve source water quality

The projects that fulfill this objective will provide many benefits to the region, such as improved stormwater and flood management and enhanced Delta water quality through reduced pollution, including reduced discharges of noncompliant wastewater, trash, road runoff, salinity, silt, and sediment levels. Many regional and downstream municipalities use the Delta as a drinking water source, so protecting this resource is an important regional and statewide goal. Providing public water and sewer service to new customers that are currently using private wells and septic systems will help to protect and improve regional surface and groundwater sources. Also, by reducing the region's reliance on Delta supplies and improving levees, saltwater intrusion and salinity levels would be reduced and higher quality water would be available for environmental use and for other water users statewide.

Maintain/improve regional treated drinking water quality

Many of the projects that are improving source water quality will also have the added benefit of improving treated drinking water quality as well. In addition to those benefits, some of the projects propose to add advanced treatment processes, such as through reverse osmosis, to their systems to enhance drinking water quality and meet regulatory requirements. Also, by repairing leaks in drinking water mains, customers' water quality at the tap will be higher.

Maintain/improve regional recycled water quality

Similar to those projects that are improving treated drinking water quality, improving source water quality will also benefit the region by helping to improve the quality of its recycled water. A number of projects will improve and increase the region's recycled water supply by implementing advanced water and wastewater treatment processes and improve the quality of drinking water effluent and wastewater influent from the collection system. Additionally, by expanding the recycled water distribution system, these projects would increase the region's use of recycled water for irrigation and industrial purposes.

Meet current and future water quality requirements for discharges to the Delta

By achieving this objective, these projects will benefit the Region by reducing pollutant loads to the Delta through various methods, such as increasing trash capture, green streets projects, salinity reduction, reservoir sediment mitigation, and reduced noncompliant wastewater discharges. Also, by increasing wastewater quality for effluent that will be discharged to the Delta, through advanced wastewater treatment process, higher quality source water and drinking water treatment, and increased recycled water production and usage.

Limit quantity and improve quality of stormwater discharges to the Delta

The benefits to the region from projects fulfilling this objective include increasing detention of peak storm flows, controlling downstream discharge, and decreasing reservoir sediment buildup in order to increase capacity, water retention, and infiltration. Additional projects will improve the water quality of regional stormwater discharges by reducing mercury and turbidity levels through the removal of silt, sediment, trash, and road runoff, by minimizing mixing with septic overflows and noncompliant wastewater discharges, and by using natural treatment aspects of constructed wetlands.

4.3.2. Restoration and Enhancement of the Delta Ecosystem and Other Environmental Resources

Projects focused on the Delta ecosystem and environmental resources recognize the importance of investments in watershed health and sustainability. Specific proposed projects will:

Enhance and restore habitat in the Delta and connected waterways

Projects that meet this objective will provide both local and statewide benefits by enhancing and restoring habitat in the Delta and connected waterways, as well as providing valuable ecological habitat for local flora and fauna and protecting the area's valuable watersheds. The restoration and enhancement of wetland habitats immediately adjacent to the Delta and connected waterways will protect groundwater and surface water, and provide habitat for special-status species. Additionally, restoring and improving historical and constructed wetland and marsh areas will provide valuable breeding and foraging habitat for State- and federally listed species.

Minimize impacts to the Delta ecosystem and other environmental resources

The benefits from projects satisfying this objective include maintaining Delta water quality and the health of the surrounding ecosystem by reducing regional flooding and road runoff impacts, lowering salinity in effluent discharges, minimizing Fats, Oils and Grease FOG-related sewer overflows, curtailing disruptive earth movements, decreasing the amount of water removed from the Delta, protecting watersheds, and restoring sensitive aquatic habitats.

Reduce greenhouse gas emissions

The projects that reduce greenhouse gas emissions will contribute to the State's goals for addressing climate change, as outlined in the Global Warming Solutions Act of 2006. Additionally, these projects will benefit the region by reducing carbon-intensive cleanup efforts due to flooding damage, offsetting energy needs by using recycled water or local groundwater sources on site rather than pumping and treating additional Delta water supplies, increasing operating efficiencies, reducing fossil fuel-based energy use, and decreasing trucking miles by providing a local FOG receiving facility for the region's use.

Provide better accessibility to waterways for subsistence fishing and recreation

The projects that fulfill this objective will provide many fishing-related benefits to the region, such as reducing mercury levels in fish that will, over time, increase the amount of fish that can be safely consumed and allow the reopening of a reservoir for recreation, which had been closed due to concerns about consumption of fish caught in the reservoir. Additionally, non-fishing-related recreational uses will be increased through the building of bird watching platforms and other passive public access facilities.

4.3.3. Funding for Water-Related Planning and Implementation

Projects that strive to improve funding for planning and implementation fall into several categories. The ultimate benefit of this focus is to make sure funds are available to implement projects delivering the benefits already described above and to ensure the public is receiving the best possible value from its investments. Projects meeting this objective:

Increase regional cost efficiencies in treatment and delivery of water, wastewater, and recycled water

The projects that meet this funding objective would provide many benefits to the region, including increasing recycled water use and local groundwater supplies, both of which would decrease water supply and treatment costs and reduce reliance on Delta water, a critical issue for the region. Additionally, these projects would decrease sediment loads currently in regional source waters and decrease TDS, salinity, and FOG levels in wastewaters, which would lead to a decrease in required water/wastewater treatment and associated system and maintenance costs. Increasing water conservation and reducing leaks improves delivery efficiency and conserves water, which reduces costs associated with treatment and delivery.

Develop projects with regional benefits that are implementable and competitive for grant funding

The benefits from the projects meeting this objective include improving stormwater and flood management, reducing pollution to the Delta, reducing reliance on Delta water supplies, protecting aquatic habitat in the Delta, and increasing the efficient use of regional resources. Furthermore, some projects will produce excess material that can be reused in other projects in

the region. A number of projects would capture runoff, or ensure that it continues to be captured, which reduces flow rates and provides flood protection to the project site and downstream regional areas. Improved potable and recycled water quality will provide region-wide health benefits as well as expand the water supply and the uses of recycled water. Also, increasing conservation efforts and alternative water supplies will decrease current water demands and take pressure off the region's water supplies, particularly the Delta water supplies. Additional benefits include increasing renewable energy use, which would reduce demand on regional energy generation from conventional sources and reduce GHG emissions, and habitat restoration, which will provide region-wide environmental benefits and recreation opportunities.

Integrate and increase opportunities for partnering with others to get more outcomes for the same dollar

The benefits from projects meeting this objective involve coordinating efforts to implement projects more cost effectively, optimize use of materials, and increase benefits to more parties; for instance, projects that will produce excess material that can be reused in other projects in the region.

Improve stability of operations

Projects that meet this objective will ultimately result in reduced cost; for example, regularly scheduled maintenance is less costly than system failures caused by a lack of maintenance. These projects will plan and design systems that are more efficient, easier to operate, and cost less to maintain.

Leveraging Existing Awarded Funds

Agencies in the ECCC region support water infrastructure and habitat planning and implementation projects that are integral to local, State, and federal goals related to water and special-status species/habitat protection. Because local projects address federal goals and priorities, funding may be secured from non-IRWMP sources. Federal grant funds often need to provide a match of non-federal funds. Without the non-federal match, such funds are at risk of being lost. IRWMP State funding can provide the critical match that will enable agencies in the east county region to leverage federal funding, increasing the opportunity for more funds for the region for completing important planning and implementation projects that address local, State and federal priorities.

4.3.4. Stormwater and Flood Management

The benefits of proposed stormwater and flood management projects are multiple. Proposed projects will provide benefits such as:

Improve regional flood risk management

By achieving this objective, these projects will benefit the region by protecting areas, including DACs, that currently experience flooding and its related issues through maintenance of existing and construction of new levees and through the expansion of existing and the construction of new storage reservoirs and stormwater detention basins. In addition, these projects will improve resiliency and speed up recovery from storm and flood events. Reduced risk and damages from excess water flows from storms and flood will result in better economic, social, and environmental outcomes.

Manage local stormwater within the region

As described previously in the water quality section, benefits from the projects meeting this objective include measures that will reduce trash, sediment, mercury, and other pollutant discharges to the Delta, reducing impacts to water quality. Furthermore, these projects will also decrease current flooding overflows and road runoff, as well as their associated problems.

4.3.5. Water-Related Outreach

The ECCC believes engagement with the community is essential to ongoing support for IRWM projects. Outreach also educates and promotes actions that residents and businesses can take in support of IRWM goals. For example, individuals and businesses can reduce pollutants entering waterways and practice water use efficiency. Finally, the community at large is benefited when DACs have access to decision making and the work of the ECCC is transparent. Some other benefits of this approach include:

Collaborate with and involve DACs in the IRWM process

The projects satisfying this objective would specifically benefit DACs by improving project identification and selection through enhanced collaboration. As a result of improved projects, these projects would reduce annual flood damages, provide public water and sewer services to communities that are currently underserved, remediate a hazardous waste site, and reduce water supply arsenic levels, which will provide direct community health benefits.

Increase awareness of water resources management issues and projects with the general public

The projects fulfilling this objective will seek to increase public awareness of the importance of salinity reduction programs and expand public knowledge of water resource issues by involving communities and small water systems in the projects, and open up restored habitat areas for public enjoyment, recreation, and a greater appreciation of the natural resources available in the Delta and the region. Voluntary adoption of renewable energy resources are a part of the project grouping. Furthermore, increased appreciation for the environment through access to areas made available.

Expanded outreach programs to the public

Expansion and creation of renewable energy sources, FOG programs, and recycled water will be accompanied by outreach programs so that citizens will understand how to properly dispose of FOG and the associated environmental and community benefits of these projects and regional water resource management. Specific outreach methods will include project signage, stakeholder meetings, water system newsletters, and city council presentations.

4.4. Potential Impacts of IRWM Plan Implementation

Based on the initial project evaluation, anticipated impacts are primarily local, temporary, and associated with construction. A smaller set of projects may also result in impacts as described in **Table 4-3**.

Table 4-3. Potential Impacts of a Small Set of Projects

Water supply projects	• Projects that increase water supply takes from the Delta have the potential to: • Negatively impact statewide water supplies • Harm endangered and protected species, including the Delta smelt • Projects that increase recycled water use could detrimentally decrease the amount of wastewater returning to the environment and impact species that rely on this water. • Recycled water projects could increase salt and nutrient loading to groundwater basins.
Water quality projects	• Advanced water quality treatment may lead to an increase in chemical use and additional treatment costs for the Region's WTPs and consumers. • Projects that alter the quality or quantity of water discharged into the Delta might have unintended consequences that could harm sensitive aquatic species.
Restoration and related projects	Tidal marsh restoration projects have a potential to: • Increase mercury methylation. This happens when projects increase dissolved organic carbon (DOC) in Delta water. Several studies indicate that methylmercury can damage developing embryos and exposure in adults has been linked to increased risk of cardiovascular disease, tremors, gingivitis, damages to the immune system and other ailments. Humans are primarily exposed by eating mercury-contaminated fish. • Increase DOC loads in drainage water • Create temporal impacts from excavation and restoration of marsh area
Desalinization projects	Create issues associated with brine discharge/disposal issues, and potential fisheries impacts
Groundwater projects	If improperly implemented can: • Damage the aquifer • Introduce contaminates or allow salinity intrusion • Increase greenhouse emissions (through energy use for pumping)
Flood and stormwater management projects	• May reallocate risk from the project location to another area in the watershed by changing flow patterns and/or increasing contaminants • May minimize understanding of actual risks from flood by the public

4.5. IRWM Plan and Project Financing

Financing planning and implementation of projects has historically been a major obstacle for ECCC IRWM member agencies. A lack of funding for planning and implementation because of slower economic development and reduced water usage has impacted agency revenues, creating insufficient or variable revenue streams. Additional funding issues are a result of the increasing competitive nature of receiving State and federal grant funding, the limited availability of these funds, and the common schedule delays associated with these funds. In the case of projects that benefit the environment but do not provide a measureable improvement to water supply reliability and/or water quality, this challenge becomes further intensified, as funding options become more limited. Without ratepayer willingness to fund a project, project survival depends wholly upon grants or subventions for implementation.

This region faces additional special challenges as many residents (23 percent) reside in economically DACs. Smaller agencies, such as those in the ECCC region, have smaller reserves and fewer staff resources, making it more difficult to meet cost share and in-kind service grant funding requirements. These special challenges are compounded by increasing construction costs, aging infrastructure, and increased regulations. Grant funds are often contingent upon certain conditions being met. These factors can affect the flow and timing of funding, and make project implementation less effective, sometimes preventing projects from proceeding to implementation.

Allocation of project payments for regional (or multi-agency) projects are often proportioned based upon the benefits expected. Under this principle, recipients of water from project implementation would bear the financial burden, rather than taxpayers overall, shifting the financial burden to the local level. Certain ECCC region members, like water districts or cities, have the ability to raise project funds through development fees or user rates. Others, like nongovernmental organizations, must rely on grants or volunteer contributions.

The IRWM Plan identifies objectives tied to funding intended to make project planning and implementation more successful in the future. These objectives are:

- Increase regional cost efficiencies in treatment and delivery of water, wastewater, and recycled water
- Develop projects with regional benefits that are implementable and competitive for grant funding
- Increase public awareness of project importance to pass ballot measures or obtain matching funds through other means that require public support

All types of appropriate funding mechanisms would be considered for project funding. The sections below discuss potential funding sources and funding certainty.

4.5.1. Potential Funding Sources

The region has historically relied upon a range of funding mechanisms to help support planning and implementation projects. While the primary source of funds is generally from the more traditional sources, other sources of funds have also helped successfully move projects into the implementation phases. Provided in **Table 4-4** is a summary of the types of funding sources the region will consider as it implements projects and actions identified in this IRWM Plan Update. Further detailed information about these funding sources can be found in the CFCC Handbook available at: http://cfcc.ca.gov/res/docs/2012%20Handbook%20.pdf.

Table 4-4. Potential Funding Sources

Source	Type	Relevance to ECCC IRWM Plan Update
State Funding	Proposition 50 and 84	Integrated projects for water supply/quality/flood.
	CDPH Safe Drinking Water State Revolving Fund	Finance long-term loans for construction projects and short-term planning grants. Special consideration and rates for DACs apply.
	California Infrastructure and Economic Development Bank	Drinking water and wastewater treatment and distribution/collection systems are eligible under this program.
	Department of Housing and Community Development	Community Development Block Grant provides funding to cities/counties for public water programs and improvements, project feasibility studies, environmental reviews.
	Department of Water Resources	Grants and funding opportunities from Propositions 84, 1E, 50, and 204 for water supply/quality/ efficiency, ecosystem restoration, flood.
	State Water Resources Control Board	Clean Water State Revolving Fund Program, which provides loans to wastewater, water recycling, and expanded use projects. Water Recycling Funding Program loans and research grants for use of treated wastewater to offset water supplies. Small Community Wastewater Program aids DACs with wastewater project financing.
Federal Funding	Department of Rural Development	For water-related programs, towns under 10,000 population. Grants used for construction, land acquisition, sewer collection system improvements.
	Environmental Protection Agency	Grants to support research, standards, and policies for air pollution, climate change, toxic waste, and drinking water.
	Bureau of Reclamation	B-D Restoration Water Use Efficiency Grants, WaterSMART Grants, and Title XVI for conservation or water management.
	U.S. Fish and Wildlife Service	Section 6 ESA funding for habitat preservation
Mitigation/Settlement Funds	Project Mitigation or Settlement of Lawsuit	For water supply, flood management, habitat restoration.
Special Assessment Districts	Non-County local government districts	Method of collecting projects funds related to a specific service (like flood management).
New Development Fees	Water Agencies	Used to pay for new water pipeline, large water facilities, or other projects to support additional service area needs.
User Fees	Water Agencies	Used to pay for new water pipeline, large water facilities, or other projects to support services benefiting existing users.
User Rates	Water Agencies	User rates pay for the operations and maintenance of a water agency or public utility's system
Bonded Debt Service (Revenue Bonds)	Water Agencies	Large facility is needed to support current and future growth
Volunteer Contributions	nonprofit/nongovernmental organizations	Used for preservation of native land and implementation of public outreach programs.

4.5.2. Funding Certainty

Historically, the ECCC region has had good success seeking funding through DWR's IRWM grant programs. Table 4-5 summarizes project planning and project implementation activity dating back to the completion of the first IRWM in 2005. Since that regional planning effort the region has been accepted as an official IRWM region though DWR's RAP, and been awarded two planning grants through the Proposition 84 planning grant program.

As a result of the regions successful collaboration in regional planning, a Proposition 50 implementation grant application prepared by the region in 2007 was successfully awarded for grant funding totaling $12.5M. These projects focused on water supply, water quality, and ecosystem restoration. In 2011, three agencies in the region successfully submitted Proposition 1E stormwater grant applications for grant funding totaling approximately $15M. CCWD is awaiting the results of this application. In March 2013 the region, with CCWD as the lead agency, submitted a Proposition 84 Implementation Round 2 grant application for a grant request of $3.4M. These projects were identified through the IRWM Plan Update (discussed previously in Section 4.1).

Table 4-5. IRWM Plan Financing

Activity Description			Approximate Total Cost	Funding Source & % of Total Cost	Funding Certainty	O&M Finance Source	O&M Finance Certainty
IRWM Plan Development	2005	Functionally Equivalent IRWM Plan	$100,000	Local Agencies, 100%	Secure	NA	NA
	2009	Region Acceptance Process	$50,000	Local Agencies, 100%	Secure	NA	NA
	2011	IRWM Plan Update – Proposition 84 Planning Round 1	$600,000	Local Agencies, 25% Prop 84 Grant, 75%	Secure Awarded	NA NA	NA NA
	2012	IRWM Plan Update – Proposition 84 Planning Round 2	$1,493,045	Local Agencies, 70% Prop 84 Grant, 30%	Secure Awarded	NA NA	NA NA
IRWM Plan Project Implementation	2006	Proposition 50, Chapter 8 – IRWM Implementation Grant	$12,500,000	Local Agencies, 83% Prop 50 Grant, 17%	Secure Awarded	Local NA	Secure NA
	2011	Proposition 1E – Stormwater Flood Management Grant Round 1 (CCFC&FCD)	$2,000,000	Local Agencies, 86% Prop 1E Grant, 14%	Local CIP Budget Awarded	Local NA	Potential future rate increase NA
	2011	Proposition 1E – Stormwater Flood Management Grant Round 1 (CCWD)	$10,000,000	Local Agencies, 50% Prop 1E Grant, 50%	Local CIP Budget Awarded	Local NA	Potential future rate increase NA
	2011	Proposition 1E – Stormwater Flood Management Grant Round 1 (Antioch)	$2,997,300	Local Agencies, 50% Prop 1E Grant, 50%	Local CIP Budget Awarded	Local NA	Potential future rate increase NA
	2011	IRWM Projects – Proposition 84 Implementation Round 1	$1,775,000	Local Agencies, 25% Prop 84 Grant, 75%	Local CIP Budget Awarded	Local NA	Potential future rate increase NA
	2013	IRWM Projects – Proposition 84 Implementation Round 2	$18,726,330	Local Agencies, 75% Prop 84 Grant, 25%	Application in review	Local NA	Potential future rate increase NA

4.6. Plan Performance Monitoring

The ECWMA will be responsible for periodically reviewing the progress of the plan in achieving the regional objectives, and reassessing project priorities as needed. Additional project oversight committees will be established as necessary.

As noted earlier, the region's objectives included qualitative or quantitative metrics. These metrics give the RWMG and its members a way to determine if the region is meeting its intent and to assess the IRWM Plan's performance. There may be two levels of monitoring: at the project level and at the IRWM Plan level. Levels of monitoring will be reported and shared with the RWMG so it can determine how well the IRWM Plan implementation is proceeding. The reporting is also valuable because it will provide needed signals of implementation progress that will allow the region to reconsider what objectives and approaches may need to be changed, updated, refined, eliminated, or supplemented. The types of monitoring that may be undertaken are shown in **Table 4-6** and categorized by objective topic.

Table 4-6. Types of Monitoring

Funding for Water-Related Planning and Implementation	• Utility rates • Unit water costs • O&M costs • Grant successes
Water Supply	• Stream flow monitoring • Surface water deliveries • Recycled water deliveries • Groundwater elevation and pumping monitoring
Water Quality and Related Regulations	• Water quality monitoring (surface water, groundwater, recycled water) • Discharge monitoring
Restoration and Enhancement of the Delta Ecosystem and other Environmental Resources	• HCP monitoring • GHG monitoring • CEQA/NEPA compliance
Stormwater and Flood Management	• Discharge monitoring • Improving level of flood protection
Outreach	• Increase participation • DAC projects • Geographic distribution

Key:
CEQA = California Environmental Quality Act
DAC = Disadvantaged Community
GHG = greenhouse gas
HCP = East Contra Costa County Habitat Conservation Plan
NEPA = National Environmental Policy Act
O&M = operations and maintenance

ECCC IRWM member agencies developed a Web site to collect and disseminate information. This Web site will be used to manage up-to-date information about planning and implementation activities. Agencies and stakeholders will have continuous access to this site for monitoring and review purposes. Occasionally, the ECWMA may discuss current project information on the Web site and determine if specific actions are required to update the information, summarize the information, or modify the way information is maintained on the Web site.

4.7. Data Management

Data and information about the IRWM Plan and its implementation will be managed using the region's IRWM Web site (http://www.eccc-irwm.com). The CCWD has served as the lead agency responsible for maintaining the data and Web site on behalf of the ECCC region. The Web site provides accessibility to the IRWM process for stakeholders and the general public, including DACs. Information on the Web site includes project information, interactive maps, and enhanced context and background information, all with a more user-friendly interface. The Web site is the way in which the region can collect, disseminate, and store data and information about the IRWM process. With these improvements, the Web site will facilitate better information dissemination to the RWMG, stakeholders, DWR, and the general public.

The Web site's best data management feature is with its management of project information. Project proponents can enter projects at any time using a detailed project form with information about project type, status, objectives met, and funding. This project information is stored in a database. A limited amount of information is available to the public to encourage collaboration, integration, and transparency. The project information can be updated by the project proponents at any time, by simply making a request to the Web site administrator.

The interface will also prove to be cost efficient over time because the project online form is easily updated to reflect the latest IRWM Guidelines or region's priorities. Finally, the interface will ensure that regional planning is a living process by allowing for continued adding, evaluating, and prioritizing of projects.

4.8. Adaptability to Future Situations

As part of the region's 2009 Region Acceptance Process application, the ECCC IRWM member agencies formed a RWMG, responsible for navigating jurisdictional complexities, coordinating with other planning efforts, and updating and implementing the ECCC Region's IRWM Plan. This IRWM Plan Update establishes a strong foundation for future planning and implementation activities. The latest IRWM Program guidelines were followed and all requirements met. While IRWM plans do not have regular update schedules, the RWMG and its members will use monitoring and be responsive to regional and statewide needs to determine the best time to Update the IRWM Plan. An IRWM Plan update could be triggered by:

- New IRWM Program guidelines or requirements
- New stakeholders or participants
- A need to change the region's boundary, such as contraction, expansion, or consolidation with another region
- Significant environmental changes or other catastrophic events
- Significant updates to local water planning or local land-use planning, such as the completion of planning efforts soon to be underway associated with the Proposition 84 DWR Round 2 Planning Grant awarded to the region in late 2012
- IRWM Plan monitoring results indicating needed changes

The region plans to follow the established IRWM Plan until there is a significant change in circumstance. The planning framework allows for results and outcomes of future planning efforts, such as the upcoming Proposition 84 DWR Round 2 planning grant effort, to be incorporated into an update of the IRWM Plan. The planning framework will support requests for implementation grant funding in Proposition 84 Round 2 (March 2013) and Round 3 funding requests and other DWR implementation grant programs, as appropriate (e.g., Proposition 1E). Furthermore, the RWMG and it members will reexamine the planning process and its components, as needed, to determine if the IRWM Plan or any of its components (e.g., objectives) need updating or revising, and to determine if recent plan enhancements warrant formal adoption of a revised plan. Moving forward, the framework created through this IRWM Plan will continue as a living process the region can rely on it to meet its current and future water management challenge.

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Chapter 5. References

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