

Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management Plan

Stakeholders	
California American Water	Monterey Bay Citizen Watershed Monitoring Network
California Coastal Commission	Monterey County Service Area 50
California Coastal Conservancy	Monterey Peninsula Regional Park District
California Department of Fish and Game	NOAA Fisheries
California State University Monterey Bay	Pebble Beach Community Service District
California State Water Resources Control Board	Pebble Beach Company
Carmel Area Wastewater District	Planning and Conservation League
Carmel River Steelhead Association	Regional Water Quality Control Board
Carmel River Watershed Conservancy	Resources Conservation District of Monterey County
Carmel Unified School District	Seaside Basin Watermaster
Carmel Valley Association	State Department of Parks & Recreation
City of Carmel-by-the-Sea	Surfrider Foundation
City of Del Rey Oaks	The Nature Conservancy
City of Pacific Grove	The Watershed Institute at CSUMB
City of Sand City	U.S. Army Corps of Engineers
City of Seaside	U.S. Fish and Wildlife Service
Monterey Bay National Marine Sanctuary	Ventana Wilderness Society

Water Management Group



City of Monterey



in cooperation with

RMC

Water and Environment

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Water Management Group Contact Information

Big Sur Land Trust
Donna Meyers
3785 Via Nona Marie, Carmel 93923
831-625-5523
Web address: www.bigsurlandtrust.org
Email: mail@bigsurlandtrust.org

City of Monterey
Tom Reeves, City Engineer
Mail Address:
City of Monterey
City Hall
Monterey, CA 93940
Tel: (831) 646-3920 FAX: (831) 646-3467
Web address: <http://www.monterey.org/>

Monterey County Water Resources Agency
Mr. Bill Phillips, Assistant General Manager
P.O. Box 930
Salinas, California 93902
Tel: (831) 755-4860 FAX: (831) 424-7935
Web address: <http://www.mcwra.co.monterey.ca.us/>

Monterey Peninsula Water Management District
Larry Hampson, Water Resources Engineer
E-mail address: larry@mpwmd.dst.ca.us or
Andrew M. Bell, District Engineer
E-mail address: andy@mpwmd.dst.ca.us
5 Harris Court, Bldg. G
P.O. Box 85
Monterey, California 93942-0085
Tel: (831) 659-2543 FAX: (831) 659-2598
Web address: <http://www.mpwmd.dst.ca.us/>

Monterey Regional Water Pollution Control Agency
Keith Israel, General Manager
5 Harris Court, Bldg D.
Monterey, California 93940-5756
Tel: (831) 372-3367 or (831) 422-1001 FAX: 831) 372-6178
Web address: <http://www.mrwpc.org/>

This document is available on the web at:
http://www.mpwmd.dst.ca.us/Mbay_IRWM/MontereyPeninsulaIRWMP-20071119.pdf
For additional information, contact Larry Hampson at (831) 659-2543

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Acronyms

AF – acre-feet
AFA – acre-feet per annum
AFY – acre feet per year
AMBAG – Association of Monterey Bay Area Governments
ASBS – Areas of Special Biological Significance
ASR – Aquifer Storage and Recovery
AWT – advanced wastewater treatment
BIRP – Begonia Iron Treatment Plant
BMP – best management practice
BSLT – Big Sur Land Trust
CDPR – California Department of Parks and Recreation (see also CSP)
CSIP – Castroville Seawater Intrusion Project
CALTRANS – California Department of Transportation
CAW – California American Water
CAWD – Carmel Area Wastewater District
CCA – Critical Coastal Area
CCC – California Coastal Commission
CCR – Central Coast Region
CDFG – California Department of Fish and Game
CDP – Coastal Development Plan
CEQA – California Environmental Quality Act
CDO – cease and desist order
CRB – Carmel River Basin
CRLF – California red-legged frog
CRMP – Carmel River Management Plan
CRRDR – Carmel River Reroute and Dam Removal
CRWC – Carmel River Watershed Conservancy
CSA – County Service Area
CSP – California State Parks
CSU – California State University
CSUMB – California State University Monterey Bay
CVSIM – Carmel Valley Simulation Program
CWA – Clean Water Act

CZARA – Coastal Zone Act Reauthorization Amendment
DPB – disinfection by-product
DSOD – California Division of Safety of Dams
DWR – California Department of Water Resources
EIR – Environmental Impact Report
EIS – Environmental Impact Statement
GRP – Groundwater Recharge Project
GWR – groundwater replenishment
ICWM – Integrated Coastal Watershed Management
ICWMP – Integrated Coastal Watershed Management Plan
IRWM – Integrated Regional Water Management
IRWMP – Integrated Regional Water Management Plan
LCP – Local Coastal Plan
LUP – Land Use Plan
MBNMS – Monterey Bay National Marine Sanctuary
MCWRA – Monterey County Water Resources Agency
MCWRP – Monterey County Water Recycling Project
MGD – million gallons per day
MM – Management Measures
MOU – memorandum of understanding
MPRPD – Monterey Peninsula Regional Parks District
MPWRS - Monterey Peninsula Water Resource System
MPWMD – Monterey Peninsula Water Management District
MRSWMP – Monterey Regional Storm Water Management Program
MRWPCA – Monterey Regional Water Pollution Control Agency
MURP – Model Urban Runoff Program
NOAA – National Oceanic and Atmospheric Administration
NOP – Notice of Preparation
NPDES – National Pollutant Discharge Elimination System
NPS – non-point source
NTU – nephelometric turbidity units
PBCSD – Pebble Beach Community Services District
PBCo – Pebble Beach Company
RURWP – Regional Urban Recycled Water Project

RM – river mile (measured from the Pacific Ocean)
RMAP – Regional Monitoring and Assessment Plan
RTP – Monterey Regional Water Pollution Control Agency Regional Treatment Plant
RWQCB – Regional Water Quality Control Board
SAC – science advisory committee
SVRP – Salinas Valley Reclamation Project
SBGMP – Seaside Basin Groundwater Management Plan
SCC – State Coastal Conservancy
SFBCDC – San Francisco Bay Conservation and Development Commission
SGB – Seaside Groundwater Basin
SSAMP – Sewer System Asset Management Plan
SVRP – Salinas Valley Reclamation Plant
SWAMP – Surface Water Ambient Monitoring Program
SWQPA – State water quality protection area
SWRCB – State Water Resources Control Board
TAC – technical advisory committee
TDS – total dissolved solids
TMDL – Total Maximum Daily Load
USACE – United States Army Corps of Engineers
USFWS – United States Fish and Wildlife Service
USGS – United States Geological Service
WDR – Waste Discharge Requirement
WQPP – Water Quality Protection Program
WMI – Watershed Management Initiative
WMG – Water Management Group

ES-1 Executive Summary

The California Department of Water Resources (DWR) and the State Water Resources Control Board (SWRCB) are encouraging local and regional water resource management entities to establish integrated regional water management plans (IRWMPs) through the collaboration of planning efforts and project coordination. The intent is to encourage these entities to implement projects focused on meeting multiple water resources needs on a regional basis.

This report documents the Integrated Regional Water Management (IRWM) planning effort undertaken in the region encompassing the groundwater basins and watersheds of the Monterey Peninsula, Carmel Bay and South Monterey Bay (see **Figure 3-1: Map of Monterey Peninsula Integrated Regional Water Management Planning Region**).

ES-2 Stakeholders and Regional Water Management Group

Development of the Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management (IRWM) Plan is a collaborative effort of public entities, non-profit entities, and for-profit (commercial) entities in the Carmel Bay, Monterey Peninsula, and Southern Monterey Bay coastal and inland areas. Stakeholders are listed below in **Table ES-1: Stakeholders**. The Big Sur Land Trust (BSLT), City of Monterey, Monterey Peninsula Water Management District (MPWMD), Monterey County Water Resources Agency (MCWRA) and the Monterey Regional Water Pollution Control Agency (MRWPCA) propose to form the Water Management Group (see **Table ES-2: Water Management Group**) to guide the development and implementation of the IRWM plan, as required by State IRWM guidelines. MPWMD has led the IRWM Planning effort in this Region. Although all stakeholders in the Region are encouraged to adopt this plan and use it to guide future planning efforts and implementation of projects, there is no local, State, or Federal mandate to do so.

Table ES-1: Stakeholders

California American Water	Monterey Bay Citizen Watershed Monitoring Network
California Coastal Commission	Monterey County Service Area 50
California Coastal Conservancy	Monterey Peninsula Regional Park District
California Department of Fish and Game	NOAA Fisheries
California State University Monterey Bay	Pebble Beach Community Service District
California State Water Resources Control Board	Pebble Beach Company
Carmel Area Wastewater District	Planning and Conservation League
Carmel River Steelhead Association	Regional Water Quality Control Board
Carmel River Watershed Conservancy	Resources Conservation District of Monterey County
Carmel Unified School District	Seaside Basin Watermaster
Carmel Valley Association	State Department of Parks & Recreation
City of Carmel-by-the-Sea	Surfrider Foundation
City of Del Rey Oaks	The Nature Conservancy
City of Pacific Grove	The Watershed Institute at CSUMB
City of Sand City	U.S. Army Corps of Engineers
City of Seaside	U.S. Fish and Wildlife Service
Monterey Bay National Marine Sanctuary	Ventana Wilderness Society

Table ES-2: Water Management Group

Participating Agency
Big Sur Land Trust
City of Monterey ¹
Monterey County Water Resources Agency ¹
Monterey Peninsula Water Management District ¹
Monterey Regional Water Pollution Control Agency ¹

ES-3 General Regional Description

The Monterey Peninsula and surrounding area are widely recognized as having immense beauty and precious natural resources, especially along the coast and inland areas of the Carmel Valley. The Region encompasses portions of the Monterey Bay National Marine Sanctuary and the Ventana Wilderness and includes three Areas of Special Biological Significance (Pt. Lobos, Carmel Bay, and Pacific Grove). The Carmel River watershed, which includes one of the most beautiful streams along the Central California coast, contains a diverse range of habitats that support several threatened species.

¹ Agency with statutory authority for managing water resources, such as potable, non-potable, storm, or waste water, in the Region.

The planning Region is located in Central Coast Regional Water Quality Control Board (RWQCB) Region 3 and lies between the Salinas River groundwater basin and the Big Sur coast. It was established based on geographic, hydrologic, and existing legal responsibilities for water resource management. The Region is approximately 347 square miles and consists of coastal watershed areas in Carmel Bay and south Monterey Bay between Pt. Lobos on the south and Sand City on the north – a 38.3-mile stretch of the Pacific coast. The area encompasses the six Monterey Peninsula cities of Carmel-by-the Sea, Del Rey Oaks, Pacific Grove, Monterey, Sand City, Seaside, and extends into portions of the unincorporated area of Monterey County in the Carmel Highlands, Pebble Beach and the inland areas of Carmel Valley and the Laguna Seca area.

The population of the Region is estimated to be about 115,000, with most of the population residing in low density housing in the Monterey Peninsula cities. Population growth in the cities is projected to decline slightly in the next 20 years as most areas are built out. Growth in both the unincorporated areas and cities may be constrained by current conditions limiting water supplies and levels of service on local roads in the Region and surrounding area^{2,3,4}. Total water production from all sources within the Monterey Peninsula Water Management District boundary averaged nearly 20,000 acre-feet annually (AFA) during Water Years 1996 through 2006 (October 1 to September 30)⁵. Population within the MPWMD boundary is estimated at 112,000, which is about 97% of the Region's estimated population⁶.

The Region is dependent on local rainfall and runoff for its potable water supply, with no connections to water sources outside of the Region. Climate in the Region is considered Mediterranean, with wide annual swings in precipitation and surface runoff that can result in near desert-like, arid conditions or in periodic downpours resulting in large floods. In the Carmel River Basin, largest watershed in the Region at 255 square miles, the average annual runoff of the Carmel River was 78,190 acre-feet (AF) for the period of record 1962-2006 (U.S. Geological Survey, measured at U.S.G.S. Near Carmel gage, 3.56 River Miles upstream of the Pacific Ocean). No flow reached this station for a 16-month period during the drought years of 1976-77. The greatest annual amount of runoff recorded at Near Carmel was estimated by the U.S.G.S. at nearly 368,000 AF during the 1982-83 Niño event.

The Monterey Peninsula Water Resource System (MPWRS) contains the majority of water resources within the planning Region. The MPWRS includes surface water in the Carmel River and Los Padres and San Clemente Reservoirs and groundwater in the Carmel Valley Aquifer, which are in the Carmel River Basin (CRB), and groundwater in the coastal subareas of the Seaside Groundwater Basins.

Total known usable storage in the Region, including surface and groundwater, is estimated to be about 37,500 AF. This consists of an estimated maximum of about 6,200 AF in the Seaside Groundwater Basin with the remainder in the Carmel River Basin within the Carmel Valley Aquifer and at Los Padres Reservoir on the main stem of the Carmel River. Groundwater storage capacity in areas outside of the MPWRS (primarily in the Tularcitos Creek and Cachagua Creek watersheds in Carmel Valley) has not

² Monterey County 21st Century Program/General Plan Update at <http://www.co.monterey.ca.us/gpu/information/index.html>. Excerpted from the Monterey County Existing Conditions Report created in September, 1999.

³ Draft 2005 Monterey County Regional Transportation Plan Appendix C: Level of Service Analysis of Regional Network Results, Association of Monterey Bay Area Governments, June 20, 2003.

⁴ Draft Environmental Impact Report, 2005 Monterey Bay Area Metropolitan Transportation Plan, Association of Monterey Bay Area Governments, 2005 Monterey County, Regional Transportation Plan, Transportation Agency for Monterey County, 2005 Santa Cruz County, Regional Transportation Plan, Santa Cruz County Regional Transportation Commission, State Clearinghouse #2004061013, Prepared by Lamphier-Gregory, 1944 Embarcadero, Oakland, CA 94606. February 15, 2005.

⁵ Reported and Adjusted Annual Average Water Production Within MPWMD During Water Years 1996 through 2006, Draft, MPWMD, November 21, 2006.

⁶ Monterey Peninsula Water Management District, 2007. Estimate from: <http://www.mpwmd.dst.ca.us/whatis/basics.htm>

been determined. Usable surface storage at the two main stem reservoirs on the Carmel River represents less than 5% of total storage. Usable storage at the San Clemente Reservoir is currently nearly zero during dry periods as the pool of water is lowered by order of the California Division of Safety of Dams to reduce the potential for failure during a seismic event. Usable storage at the Los Padres Reservoir is projected to decrease from about 1,400 AF currently to zero within 40 to 50 years due to the relatively high sediment yields in the contributing watersheds.

To protect steelhead in the Carmel River, direct diversions from surface storage in Carmel Valley are no longer used to meet municipal supply. Instead, stored water is released from Los Padres Reservoir during dry periods to meet instream flow requirements and partially offset environmental damage from groundwater extraction farther downstream. Thus, the Region is mostly dependent on a system of wells in Carmel Valley and in the Seaside Groundwater Basin to meet municipal demand for potable water.

Approximately 700 AF per year of wastewater from the Carmel Area Wastewater District treatment plant is reclaimed and piped within the Region for turf irrigation, golf courses and other areas in Pebble Beach. The Monterey Regional Water Pollution Control Agency (MRWPCA) Regional Treatment Plant near the mouth of the Salinas River services a total population of about 250,000, which includes areas both inside and outside of the planning Region, and processes about 22 million gallons per day (MGD). MRWPCA treats up to 25,000 AF of municipal wastewater annually, with nearly 9,000 AF coming from within the Planning Region. A substantial portion of this flow is tertiary treated, recycled and supplied for irrigation to nearly 12,000 acres of farmland in the northern Salinas Valley. Peak dry weather flow capacity of this plant is calculated at 29.6 MGD, and peak wet weather flows are estimated at 75.6 MGD (note – a 10 MGD rate is equivalent to about 11,200 AF per year).

The average annual runoff volume of storm water from urbanized areas outside of the Carmel River watershed is estimated at approximately 2,400 AF annually. Currently, this resource is being investigated for the potential to capture and reuse storm water in the Region. Runoff from urbanized areas is managed under a National Pollution Discharge Elimination System Phase II permit authorized by the RWQCB that incorporates six measures to control pollution. Urban runoff entering the Carmel Bay and Pacific Grove ASBS is subject to restrictions set by the RWQCB and is an issue of concern for dischargers to the ASBS (Cities of Carmel-by-the-Sea, Monterey, Pacific Grove, and areas of Pebble Beach).

ES-4 Goals and Objectives

Development of goals and objectives is a key step in the integrated regional water management planning process. Goals are established for broadly outlining the IRWMP direction, whereas objectives provide a basis for decision making, guide work efforts, and may be used to evaluate project benefits. MPWMD coordinated a stakeholder outreach to determine the goals and objectives that are included in this IRWMP. The goals, which were refined over several meetings of the Technical Advisory Committee organized by the Water Management Group, are identified in **Table ES-3: Regional Goals**.

Table ES-3: Regional Goals

Regional Communication and Cooperation	
Identify an appropriate forum for regional communication, cooperation, and education. Develop protocols for reducing inconsistencies in water management strategies between local, regional, State, and Federal entities.	
Water Supply	Water Quality
Improve regional water supply reliability through environmentally responsible solutions, promote water conservation, and protect the community from drought with a focus on interagency cooperation and conjunctive use of regional water resources.	Protect and improve water quality for beneficial uses consistent with regional community interests and the RWQCB basin plan through planning and implementation in cooperation with local and state agencies and regional stakeholders.
Flood Protection and Erosion Prevention	Environmental Protection and Enhancement
Ensure that flood protection and erosion prevention strategies are developed and implemented through a collaborative and watershed-wide approach and are designed to maximize opportunities for comprehensive management of water resources.	Preserve the environmental wealth and well-being of the Region's watersheds by taking advantage of opportunities to assess, restore and enhance natural resources of streams and watershed areas when developing water supply, water quality, and flood protection strategies.

The plan objectives were developed based on the goals set for the region. Several objectives were developed in order to address the major water related issues and conflicts within the region. The objectives are more specific than regional goals. They are presented in **Table ES-4: Water Supply and Water Quality Objectives**

Table ES-4: Water Supply and Water Quality Objectives

Water Supply	Water Quality
<ul style="list-style-type: none"> • Meet water supply replacement targets set by MPWMD that satisfy existing water demand and meet the following current requirements: State Water Resources Control Board Order No. WR 95-10 (and subsequent orders); Seaside Groundwater Basin Final Decision (Case No. M66343). This is currently estimated to be approximately 12,500 acre-feet (AF) annually (note that total municipal use in 2006 was 18,830 AF). Once existing demand is met (e.g., through implementation of water supply projects), achieve water supply targets set by MPWMD to meet estimated long-term future demand, based on General Plan Build-Out estimates. This is currently estimated to be approximately 4,550 acre-feet annually. • Maintain the quantity and quality of water in the Seaside Groundwater Basin as specified in the Final Decision setting forth the adjudicated rights in the Groundwater Basin. • Minimize the impacts to sensitive species and habitats from diversions (surface and groundwater) by optimizing the use of groundwater storage and conjunctive use options. • Maximize use of recycled water. • Optimize conjunctive use of surface and groundwater. • Optimize the use of groundwater • Evaluate, advance, and create water conservation efforts throughout the Region. • Minimize fiscal impacts to ratepayers and taxpayers. 	<ul style="list-style-type: none"> • Meet or exceed applicable water quality standards established by regulatory processes or by stakeholders (whichever is higher). • Improve water quality for environmental resource (e.g. steelhead). Protect surface waters and groundwater basins from contamination and threat of contamination. • Meet or exceed recycled water quality targets established by stakeholders. • Minimize impacts from storm water (or urban) runoff through implementation of Best Management Practices or other alternatives. • Improve stream and near-shore water quality.

Table ES-5: Flood Protection and Erosion Prevention, Environmental Protection and Enhancement, and Regional Communication Objectives

Flood Protection and Erosion Prevention	Environmental Protection and Enhancement	Regional Communication
<ul style="list-style-type: none"> • Develop regional projects and plans that are necessary to protect existing infrastructure and sensitive habitats from flood and erosion damage. • Develop approaches for adaptive management that minimize maintenance and repair requirements. • Protect quality and availability of water while preserving or restoring ecologic and stream functions; enhance aquatic and riparian resources when appropriate. • Provide community benefits beyond flood protection and erosion prevention, such as public access, open space, recreation, agricultural preservation, and economic development. 	<ul style="list-style-type: none"> • Identify opportunities to assess, protect, enhance, and/or restore natural resources when developing water management strategies and projects. • Protect and enhance sensitive species and their habitats in the regional watersheds. • Minimize adverse effects on biological and cultural resources, including riparian habitats, habitats supporting sensitive plant or animal species, and archaeological sites when implementing strategies and projects. • Identify opportunities for open spaces, trails and parks along streams and other recreational areas in the watershed that can be incorporated into water supply, water quality, or flood protection projects. • Identify and integrate elements from appropriate Federal and State species protection and recovery plans and from other similar plans (e.g., SWRCB Critical Coastal Areas Program) that are applicable to the region. 	<ul style="list-style-type: none"> • Meet or exceed State and Federal regulatory orders. • Identify strategies for protecting both infrastructure and environmental resources. • Foster collaboration between regional entities to minimize and resolve potential conflicts and to obtain support for environmentally responsible water supply solutions. • Build relationships with State and Federal regulatory agencies and other water forums and agencies to facilitate the permitting, planning and implementation of water-related projects. • Identify opportunities for public education about the need, complexity, and cost of strategies, programs, plans, and projects to improve water supply, water quality, flood management, coastal conservation, and environmental protection.

ES-5 Regional Priorities

Through a community outreach program, workshops, and deliberation with stakeholders, the following Regional Priorities were identified:

- meet current replacement supply and future demand targets for water supply and support the Seaside Groundwater Basin Watermaster to implement the physical solution in the Basin
- reduce the potential for flooding in Carmel Valley and at the Carmel River Lagoon
- mitigate effects of storm water runoff throughout the planning Region
- address storm water discharges into Areas of Special Biological Significance
- promote the steelhead run

ES-6 Prioritized Projects for Implementation

Several projects in various phases of planning and design were examined for implementation as a part of this plan. Project descriptions are provided in Chapter 7. They were reviewed and prioritized by a process that ranked the projects based on a set of criteria that included the following elements:

- Satisfaction of regional objectives and water management strategies
- Alignment with regional priorities
- Technical feasibility and readiness to proceed (planning/design/permit acquisition)

The prioritization procedure is described in detail in Chapter 6. It should be noted that a method to evaluate the financial feasibility of individual projects has not been developed. Projects described in the Plan were preliminary ranked with results shown in **Table ES-6**: A score of 100 represents a project package that is 100% feasible and meets all the objectives for the region. Projects proposed for inclusion in this IRWMP are in varied stages of technical analysis and pre-design study. Their prioritization in this Draft IRWMP reflects relative degrees of uncertainty regarding funding, the scope of work, readiness to proceed, and other factors affecting feasibility. It is anticipated that re-prioritization of projects prior to adoption of this IRWMP will change the relative ranking of proposed projects.

Table ES-6: Summary of Prioritization Results

Project	Sponsor	Strategies	Objectives	Regional Priorities	Feasibility	Total	Ranking
Lower Carmel River Restoration and Floodplain Enhancement	MCWRA/BSLT/MPWMD	2.36	3.26	5.99	0.75	12.36	1
Refine ASBS Alternatives	Monterey/PG	2.83	3.44	3.99	2.04	12.30	2
Water Conservation Retrofit Program	MPWMD/CAW	1.89	2.36	1.58	1.63	7.45	3
CSUMB Stormwater Percolation and Education	CSUMB	2.13	2.90	1.09	1.21	7.33	4
Seaside 90" Outfall Infiltration Component	City of Seaside	2.36	2.72	1.29	0.65	7.03	5
Seaside Basin Groundwater Replenishment	MRWPCA	1.65	2.72	2.05	0.56	6.98	6
Carmel River Watershed Volunteer Monitoring Program	CRWC	1.42	2.72	1.09	1.21	6.44	7
Sanitary Sewer System Repair and Replacement	Monterey/PG	0.94	2.36	0.64	1.59	5.53	8
Microbial Source Tracking	Monterey/PG	0.71	1.27	0.00	2.06	4.03	9
Implementation of Solid Waste Removal Technology	Monterey/PG	0.71	1.27	0.00	1.75	3.72	10
Seaside Groundwater Basin Aquifer Storage and Recovery (not rated at this time)	MPWMD/CAW						N/A
Total Points, All Projects		17.0	25.0	17.7	13.4	73.2	
Maximum Possible Points for All Projects		17.0	25.0	33.0	25.0	100.0	

ES-7 Impacts and Benefits

The benefits of integrated regional planning are prominent in a region that depends solely on rainfall, runoff, and groundwater resources within its boundaries to supply its water needs. The people and local governments of the Monterey Peninsula and surrounding areas have historically looked carefully at resource development and management plans with a desire to be good stewards of the precious natural resources and immense beauty in the area. In recent years, careful planning on a regional scale has become increasingly necessary in order to balance local water needs with regional resource sustainability. Implementation of the strategies and projects included in this Plan extends these concepts and will lead to numerous benefits including:

- Increased water supply reliability.

- Water quality improvement in the Seaside Groundwater Basin, surface water streamside corridors and in the near-shore environment.
- Public health protection from non-point source water pollution.
- Reduced damages from erosion and flooding.
- Protection of beneficial uses, including recreation, aquatic life, and habitat value.

Beneficiaries include: residents and visitors in the Region; commercial and non-profit operations involved in tourism, hospitality, and recreation; educational institutions such as California State University Monterey Bay; Cities, special districts, and Monterey County agencies.

Implementation of the projects described in this plan may also have quantitative and/or qualitative impacts if the projects are not managed or implemented well. These impacts may include:

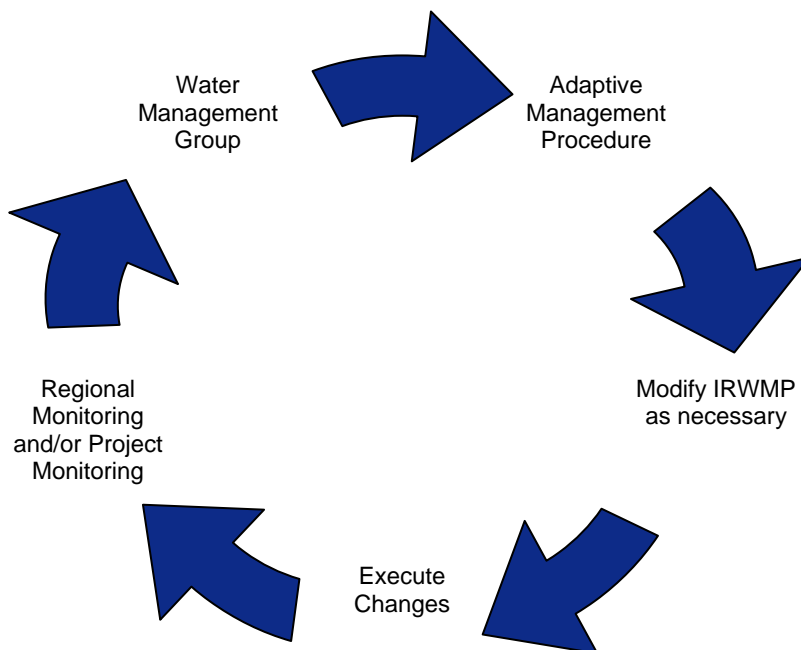
- Increased project costs to agencies and ratepayers.
- Delayed construction of planned facilities leading to delayed water supply and other benefits.
- Temporary impacts due to construction-related activities.

ES-8 Plan Performance, Data Management and Data Dissemination

The Water Management Group is developing the framework for a Regional Monitoring and Assessment Plan (RMAP) that will be used to ensure that objectives are met and projects are implemented and operated correctly so that negative impacts associated with poor management are avoided.

RMAP consists of using quantifiable metrics to assess plan performance based on both independent and regional monitoring activities. **Figure ES-1** is a conceptual view of the RMAP process.

Figure ES-1: The Regional Monitoring and Assessment Plan (RMAP) Process



Future data collection and dissemination will occur with oversight from the Water Management Group and MPWMD as lead agency. Regional data will be collected and shared via current methods with special attention focused on ways to improve data sharing. MPWMD is developing an electronic document library that will ease data transfers between water purveyors and stakeholders.

MPWMD will provide updates on conditions in the Seaside Groundwater Basin and the Carmel River watershed through annual reports provided to appropriate agencies and through its website as future projects are implemented. Ongoing data gathering efforts will be incorporated into the GIS being developed by MPWMD. However, because of the large file sizes associated with the GIS, these data will be available on CDs upon request. MPWMD plans to develop an interactive, web mapserver to make GIS data more readily available to the public.

The Water Management Group is committed to cooperation with the State to provide data that are consistent with statewide data needs. The data acquired in the IRWMP process is managed in a format compatible with State and Federal databases such as Surface Water Ambient Monitoring Program (SWAMP), Groundwater Ambient Monitoring Assessment (GAMA), and California Environmental Resources Evaluation System (CERES). The data produced will be shared with these programs. Reports that are developed through the IRWMP process will be provided to the appropriate State and Federal agencies for use in their programs.

ES-9 Plan Funding and Financing

Obtaining financing for capital and O&M costs will be the responsibility of project sponsors. Stakeholders agreed that the minimum local match would be 10% of the total project cost in order to be eligible for inclusion in the suite of projects in this IRWMP. An exception can be made for projects without significant local funds that improve the overall effectiveness of the suite of projects. Project funding can be achieved through the following approaches:

- Development fees
- User fees, user rates/rate recovery
- Property taxes
- General or Capital Improvement Funds
- Charitable trusts, land trusts, conservancies, foundations and other non-profit resources
- Local, State and Federal grant programs

Ongoing support and financing for operation and maintenance of projects implemented under this IRWMP will be identified by project sponsors and may include some of the funding sources used to implement the projects.

A summary of estimated project costs is shown below.

Table ES-7: Summary of Preliminary Cost Estimate

Project	Responsible Agency	Project Beneficiaries	Estimated Cost	Funding Source
Aquifer Storage and Recovery	MPWMD/ CAW	Region	TBD	N/A
Seaside Basin Groundwater Replenishment Project	MRWPCA	Region	\$2,200,000	To be identified
CSUMB Storm Water Percolation and Education Project	CSUMB	Seaside Basin/ Monterey Bay	3,526,000	To be identified
Lower Carmel River Restoration and Floodplain Enhancement	BSLT/ MCWRA/MP WMD	Lower Carmel River	1,675,000	To be identified
Carmel River Watershed Volunteer Monitoring Program	CRWC	Region	750,000	To be identified
Sanitary Sewer System Repair and Replacement in the Cities of Monterey and Pacific Grove	Monterey/ P.G.	Monterey/PG/ Monterey Bay	9,407,500	To be identified
Implementation of Solid Waste Removal Technology	Monterey/ P.G.	Monterey/PG/ Monterey Bay	990,000	To be identified
Microbial Source Tracking in the Cities of Monterey and Pacific Grove	Mont/ P.G./ Found.	Monterey/PG/ Monterey Bay	252,000	To be identified
Refine ASBS Alternatives	Monterey	Monterey/PG/ PG ASBS	450,000	To be identified
Water Conservation Retrofit Program	MPWMD	Region	160,000	To be identified
Seaside 90" Outfall Infiltration Component	Seaside	Region	8,325,000	To be identified
Total			\$27,735,500	

TBD- to be determined

ES-10 Statewide Priorities

Statewide priorities were considered qualitatively in the planning process. The proposed project package will integrate the following statewide priorities (as determined by SWRCB and DWR):

- Reduce conflicts between water users or resolve water rights disputes;
- Implementation of the RWQCB Watershed Management Initiative Chapters Plans and Policies;
- Implementation of SWRCB's Non Point Source Pollution Plan; and
- Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or species recovery plan.

ES-11 Relation to Local Planning

During the integrated regional planning process, MPWMD facilitated the development of the IRWM Plan with local government, non-profit, stakeholder and commercial entities in an effort to ensure coordinated local water resource planning. The Plan was aligned with important local plans including:

- Monterey County General Plan Update GPU4 (Note this plan update was the subject of several June 2007 ballot measures. Voters said no to a measure to approve the Supervisor-approved update, but also said no to a measure to repeal the update. It is unclear at this time when or how the General Plan may change and if this IRWMP would be affected.)
- Carmel River Watershed Assessment (2004) and Action Plan (2006, draft)
- Big Sur Land Trust Carmel River Parkway Vision Plan (2005)
- Monterey County Floodplain Management Plan (2003)
- California American Water 2006-2010 Urban Water Management Plan
- Carmel Valley Master Plan (1996)
- Carmel River Management Plan (1984, draft 2007 revision)
- Pacific Grove Sewer System Asset Plan (2004)
- Study Plan for Long Term Adaptive Management of the Carmel River State Beach and Lagoon (2007)
- Monterey Regional Storm Water Management Program (November 2006)
- Monterey Peninsula Water Management District Strategic Plan (2007)
- Seaside Groundwater Basin Final Statement of Decision (2006)
- Seaside Groundwater Basin Monitoring and Management Plan (2006)
- Monterey Bay Draft Management Plan (2006)

There are several concurrent planning efforts to augment water supplies for the Region, including proposed desalination projects in the Moss Landing area, which is outside of the planning Region. In addition, local, State and Federal agencies are studying alternatives to retrofit San Clemente Dam on the Carmel River main stem to improve the safety of this dam. The Water Management Group, Stakeholder Group, and the Technical Advisory Committee, which is comprised of representatives from throughout the Region, will be directly involved in coordinating IRWMP projects with ongoing local planning efforts and projects as they are developed.

ES-12 Stakeholder Involvement

The participating entities in the Water Management Group, members of the Technical Advisory Committee, and stakeholders involved in the development of the IRWMP continue to identify groups, individuals, entities and other stakeholders who can benefit from participating in the IRWMP. Prior to adoption of the Final IRWMP, an outreach effort is proposed for areas that have not participated in plan development. Outreach may consist of advertisements, public notices, and public workshops.

The stakeholder outreach process is discussed in Chapter 14.

Chapter 1 Introduction

The California Department of Water Resources (DWR) and the State Water Resources Control Board (SWRCB) are encouraging local and regional water resource management entities to establish integrated regional water management plans (IRWMPs) through the collaboration of planning efforts and project coordination. The intent is to encourage these entities to implement projects focused on meeting multiple water resources needs on a regional basis. Together, the two state agencies solicited grant applications in 2005 and 2006 for Proposition 50 Chapter 8 grant funding, which was established to provide a fiscal tool to support integrated regional water management (IRWM).

On behalf of a Regional Stakeholder Group, the Monterey Peninsula Water Management District (MPWMD) applied for a planning grant to complete an IRWM Plan for the region encompassing the groundwater basins and watersheds of the Monterey Peninsula, Carmel Bay and South Monterey Bay (see **Figure 3-1: Map of Monterey Peninsula Integrated Regional Water Management Planning Region**). In January 2006, DWR awarded a grant of approximately \$497,000 to MPWMD to develop and complete a plan, which is presented in this document.

IRWM Plan Standards

The State has provided guidelines for the Proposition 50, Chapter 8 Grant Program that outline standards for developing IRWM Plans and functionally equivalent documents. These standards have guided IRWM Planning in the Monterey Peninsula Region.

Note to reader – Text boxes similar to this one are provided at the beginning of each chapter throughout this Plan to indicate compliance with these standards. The boxes briefly explain individual IRWM Plan standards described in Appendix A of “Integrated Regional Water Management Grant Program Guidelines, November 2004, Department of Water Resources and State Water Resources Control Board, Proposition 50, Chapter 8.” For a complete copy, visit <http://www.grantsloans.water.ca.gov/grants/integregio.cfm>

1.2 Integrated Regional Water Management Planning

As directed by the State’s IRWM guidelines, a planning region was established based on surface and groundwater hydrologic characteristics and boundaries. The planning area boundary also reflects divisions in local resource agency jurisdictions.

The geographic boundary includes the Carmel River watershed and all watersheds within the Monterey Peninsula Water Management District (MPWMD). Hydrologic and jurisdictional boundaries are coterminous along the northern and most of the eastern boundary where the Seaside Groundwater Basin (SGB) and the Salinas Valley Groundwater Basin meet. It should be noted that the Salinas Valley Groundwater Basin is included in the Salinas Valley IRWMP – an area that is under the sole jurisdiction of the Monterey County Water Resources Agency (MCWRA). As a result of the adjudication of the Seaside Groundwater Basin in 2006, the court ordered the formation of a Watermaster and mandated a “physical solution” to the overdraft problem. The Watermaster is comprised of nine local entities including MCWRA and MPWMD.

A portion of the eastern boundary and the southern boundary is defined by the hydrologic limits of the Carmel River watershed and the southern limit of MPWMD’s jurisdiction. The western limit of the planning Region extends to the interface with the Pacific Ocean and includes areas offshore that are affected by inland activities.

The planning area for this IRWMP reflects a division of responsibilities for management of water supply projects, water resources, and flood control for the Pajaro, Salinas, and Carmel Rivers. A Memorandum of Understanding among MPWMD, MCWRA, and the Pajaro Valley Water Management Agency established this division in 1990.

Ecologic boundaries, especially for species listed as threatened under the federal Endangered Species Act in the Region (such as steelhead and California red-legged frogs or CRLF) and sensitive species in the ocean overlap individual IRWMP regions along the Central Coast. For example, the North Santa Cruz County IRWMP, Salinas Valley IRWMP, Pajaro Valley IRWMP and other water resource management plans within Monterey and San Luis Obispo Counties are likely to affect conditions in the Monterey Bay National Marine Sanctuary (MBNMS) and in Areas of Special Biological Significance (ASBS). Coordination of actions contained in these IRWMPs that may affect the MBNMS, ASBS, and threatened species began with inter-agency discussions in 2006 concerning Prop. 50 funds for implementation projects and is expected to continue with projects proposed to be funded under Prop. 84. Ecological planning areas have been established in recovery plans by the Federal agencies responsible for listing steelhead and CRLF.

Early in the planning process, a stakeholder group was identified and a Water Management Group was formed (see Chapter 2), which was tasked with guiding the development and completion of the IRWM Plan. Development of goals, objectives, and priorities were key steps in the integrated regional water management planning process. In the initial planning phase of the IRWM process, the regional stakeholder group developed a set of planning goals and objectives in order to guide the integrated regional planning efforts and to serve as a plan checklist. These goals and objectives were then refined over several meetings as the planning process progressed, as described in Chapter 4. The goals developed during this process are presented in **Table 1-1**.

An important step in the planning process was to develop regional priorities. Initially, both short-term and long-term priorities were described. After discussion among the stakeholder group, it was determined that no time element (i.e., short and long term) should be attached to priorities. However, as a result of the project prioritization process, it appears that lower cost projects that are relatively simple to implement and projects with multiple goals and objectives are ranked the highest.

Development of a project prioritization procedure was accomplished through an iterative process that involved proposing a procedure, bringing the stakeholder group together to use the procedure to prioritize projects, and then refining the procedure based on the feedback of the stakeholders during the project prioritization process. Through this process, the stakeholder group was able to combine IRWM guidelines with local priorities to select a set of projects that best meets the Region's needs.

This plan is intended to be formally adopted by the Water Management Group and project sponsors. However, there is no local, State, or Federal mandate to do so.

Table 1-1: Integrated Regional Water Management Planning Process Goals

IRWM Planning Process Goals	Accomplished
1. Develop a comprehensive IRWMP for the Monterey Peninsula, Carmel Bay, and South Monterey Bay area that incorporates objectives consistent with those of Proposition 50, Chapter 8 (Prop 50 Chap 8), which encourages Regions to work together to provide reliable water supply, protect or improve water quality, and achieve other objectives.	✓
2. Improve and maximize coordination of plans, programs, and projects throughout the Region for mutual benefit and optimal regional gain.	✓
3. Identify, develop and implement collaborative plans, programs, and projects that may be beyond the scope or capability of a single entity, but which would be of mutual benefit if implemented among multiple entities.	✓
4. Facilitate regional water management efforts with multiple objectives including (but not limited to) water supply reliability, improved water quality, water conservation, recreation, flood control, and environmental protection and enhancement.	✓
5. Foster coordination, collaboration, and communication between entities including local resource agencies, Cities, the County of Monterey, State agencies, Federal agencies, commercial water providers, non-profit organizations, and interested stakeholders to achieve greater efficiencies, enhance public services, and build public support for vital projects.	✓
6. Realize regional water management objectives at the least cost through mutual cooperation, elimination of redundancy and enhanced competitiveness for State and Federal grant funding.	✓

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Chapter 2 Regional Water Management

IRWM Standard A

This section describes the regional agency responsible for the development and implementation of the Plan. It includes the member agencies and organizations and their management responsibilities related to water. This section demonstrates that all agencies and organizations that were necessary to address the objectives and water management strategies of the Plan were involved in the planning process.

2.1 Regional Entities

Development of the “Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management (IRWM) Plan” is a collaborative effort of public entities, non-profit entities, and for-profit (commercial) entities in the Carmel Bay, Monterey Peninsula, and Southern Monterey Bay coastal and inland areas. These are, collectively, the stakeholders in the Region. The Monterey Peninsula Water Management District (MPWMD) is the lead entity responsible for facilitating the development and implementation of the Plan.

The Water Management Group, which is discussed in more detail below, is comprised of the Big Sur Land Trust (BSLT), the City of Monterey, the Monterey County Water Resources Agency (MCWRA), the Monterey Regional Water Pollution Control Agency (MRWPCA), and MPWMD. This group, which represents the diverse interests of the Region, was formed in conformance with State IRWM guidelines to guide the development and implementation of the IRWM plan. Both MCWRA and MPWMD have responsibility for integrated water resource management within the Region. MRWPCA has multi-regional responsibility for wastewater treatment (Monterey Peninsula and Salinas Valley Regions). The City of Monterey provides storm water collection, maintains the sanitary sewer system, and manages park and open space areas for a population of 30,161⁷ within its jurisdiction. Monterey is coordinating data collection and analysis of storm water discharges from the Cities of Monterey and Pacific Grove (population of 15,305⁸) into the Pacific Grove Area of Special Biological Significance. The Big Sur Land Trust, which has been conserving coastal resources along the California central coast for more than a quarter of a century, serves as a bridge between private and public sectors and has recently increased its participation in resource planning for the Carmel Valley. Stakeholders are identified in Table 2-3: Stakeholders. All entities in the planning Region with responsibility for or interest in water resources management and other IRWM elements were invited to be included in the planning process.

2.1.1 Water Management Group

Water Management Group (WMG) participating agencies are summarized in **Table 2-1** and discussed below.

Table 2-1: Water Management Group

Participating Agency	Acronym
Big Sur Land Trust	BSLT
City of Monterey ⁷	Monterey
Monterey County Water Resources Agency ⁹	MCWRA
Monterey Peninsula Water Management District ⁷	MPWMD
Monterey Regional Water Pollution Control Agency ⁷	MRWPCA

⁷ City of Monterey web site, as of January 1, 2006. <http://www.monterey.org/populate.html>

⁸ Ibid.

⁹ Agency with statutory authority over water resources in the Region.

Big Sur Land Trust (BSLT)

The Big Sur Land Trust (BSLT) strategically and responsibly identifies and acquires valuable landscapes to protect them from the growing pressures of development as a legacy for future generations. A harmonious but fragile balance between man and nature still exists within the planning Region. The Big Sur Land Trust has been working to protect the incredible lands throughout California's central coast for more than a quarter of a century. Since its inception, the Big Sur Land Trust has become a national leader in land conservation forging partnerships with willing landowners to protect land from development at a time of unrivalled and unparalleled growth in California either through acquisition or the establishment of conservation easements. Creating an effective private sector alternative for land preservation, the Big Sur Land Trust also serves as a bridge between private and public sectors.

The Big Sur Land Trust, a Carmel-based non-profit organization, has protected more than 30,000 acres of spectacular landscapes along the Big Sur Coast, Monterey Bay shoreline, and other special places in Monterey County. Its efforts include habitat and nature restoration, watershed management, and land conservancy. The Big Sur Land Trust protects shoreline, wildlife habitat, streams, forests, grasslands and awe inspiring views. Big Sur Land Trust's vision includes leaving a remarkable legacy for all generations.

BSLT is working on several projects in the Region with the California Coastal Conservancy and the Department of Parks and Recreation (State Parks), the Monterey County Water Resources Agency, the Monterey Peninsula Water Management District, The Nature Conservancy, the Monterey Bay National Marine Sanctuary, the Carmel River Watershed Conservancy and the Monterey Peninsula Regional Park District. State Parks operates seven historical and recreational areas near the coast in this Region, including the Carmel River Lagoon and State Beach. The Nature Conservancy is a conservation organization that works to protect ecologically important lands and waters. Monterey Peninsula Regional Park District manages more than 20,000 acres within its boundary.

BSLT brings a unique perspective to the Stakeholder group with contacts and extensive experience with the private sector.

City of Monterey

The City of Monterey, founded when an expedition by land and sea brought Gaspar de Portolá and Franciscan Father Junipero Serra to Monterey in 1770, provides a range of services to its population including maintenance and development of outdoor recreation facilities (parks), management of historic Monterey Harbor, maintenance of sewers, and storm water management. Monterey is one of more than 300 California cities operating under the Council-City Manager form of government.

Monterey represents the interests of the six Monterey Peninsula cities that constitute a major urban service area in the MPWMD district boundary. Monterey and other cities provide various municipal services.

Monterey Peninsula Water Management District (MPWMD)

The Monterey Peninsula Water Management District is a special district formed in 1978 under the California Water Code, Chapter 118 to manage, augment, and protect water resources for the benefit of the community and the environment. Approximately 112,000 people live within the jurisdictional boundary of MPWMD, which includes the six Monterey Peninsula cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Seaside, and Sand City, and unincorporated communities within Monterey County including Pebble Beach, the Carmel Highlands, a portion of Carmel Valley, and areas adjacent to Highway 68 between Del Rey Oaks and the Laguna Seca area (also known as Arroyo Del Rey or Canyon Del Rey).

The District is governed by a seven-member Board of Directors, five elected from voter divisions, one member of the Monterey County Board of Supervisors, and one elected official or chief executive officer appointed by the City Selection Committee comprised of mayors from all Cities within Monterey County.

MPWMD manages the production and use of water from the Carmel River stored in Los Padres Reservoir (note: the San Clemente Reservoir is no longer used to provide municipal supply), water production in the Carmel Valley aquifer, and groundwater pumped from municipal and private wells in Carmel Valley and the Seaside Groundwater Basins. Portions of MPWMD's jurisdictional area include watersheds and groundwater basins with area that is outside of the MPWMD political boundary, but that directly influences the quantity and quality of water resources within the MPWMD boundary.

As described in the 2007 Strategic Plan, the Board of Director's Vision Statement¹⁰ describes that MPWMD:

- 1) will strive to serve as a catalyst in collaboration with public and private entities for environmentally responsible solutions that result in a reliable and legal water supply; and
- 2) shall be a fiscally responsible, professionally and publicly respected leader in managing water resources.

Three-Year goals set by the MPWMD Board of Directors for 2006-2009 (not in priority order)

- Establish respectful and effective relationships among the MPWMD, California American Water, jurisdictions and the Watermaster
- Determine long-term water supply solution(s)
- Complete Aquifer Storage and Recovery (ASR) Phase 1 Project and complete expanded ASR project(s)
- Enhance revenue from external resources
- Enhance the protection of water resources of the Carmel River and the Seaside Ground Water Basin for the benefit of the environment and the community

MPWMD's legislative functions are to:

- Augment the water supply through integrated management of surface and ground water resources;
- Promote water conservation (including rationing, if needed);
- Promote water reuse and reclamation of storm and waste water; and
- Foster the environmental quality, native vegetation, fish and wildlife, scenic values and recreation on the Monterey Peninsula and in the Carmel River basin.

Monterey County Water Resources Agency (MCWRA)

The Monterey County Water Resources Agency was formed under Chapter 699 of the Statutes of 1947 as the Monterey County Flood Control and Water Conservation District. In 1990, the District was renamed the Monterey County Water Resources Agency in Chapter 2 of the Water Code Appendix. Within the Region, MCWRA is responsible for providing flood protection in the unincorporated areas of Monterey County. Watershed areas outside of the MPWMD boundary, but within the geographical area of the Region, are within the jurisdiction of the Monterey County Water Resources Agency (MCWRA).

¹⁰ See <http://www.mpwmd.dst.ca.us/StPlan/StPlan0407thru0907/Final0407thru0907StPlan.htm> for details.

The agency is governed by a nine-member Board of Directors, five appointed by the Monterey County Board of Supervisors (one by each supervisor), four directors appointed by a majority vote of the supervisors from nominees submitted by three Monterey County agricultural groups and one from the Monterey County Mayors Select Committee.

It should be noted that MCWRA is also the lead agency for the Salinas Valley Integrated Regional Water Management Plan. However, within the Monterey Peninsula Region, its responsibilities for resource management are shared by other regional entities.

Monterey Regional Water Pollution Control Agency (MRWPCA)

The Monterey Regional Water Pollution Control Agency is a joint powers agency formed in 1972 to provide wastewater collection and treatment to the Monterey Peninsula cities (except Carmel-by-the-Sea). MRWPCA also serves communities within its boundaries that are outside of the Monterey Peninsula Region (e.g., Salinas and Castroville). MRWPCA is governed by a Board of Directors representing each of the jurisdictions that it serves. The agency has a regional treatment plant on the Salinas River and discharges treated wastewater effluent into the Monterey Bay near the Salinas River mouth in addition to producing recycled water for agricultural irrigation; however, MRWPCA has a long-term plan to eliminate wastewater discharges to the Monterey Bay by constructing projects to recycle water within its jurisdictional area.

MRWPCA is dedicated to meeting the wastewater and reclamation needs of the member agencies while protecting the environment. Core values of the agency include (not in priority order):

- Cost-efficient, consistent and reliable service and business practices
- Open, honest lines of communication between and among Board, public and staff
- Ethical behavior
- Customer-focused and centered
- Helpful and timely responses
- Loyalty and dedication

Three-year goals for 2005-2008 include:

- Maximize the use of recycled water (includes the Regional Urban Water Augmentation, Recycled Water Public Outreach, and Groundwater Replenishment Projects)
- Develop and begin to implement a plan to provide conveyance capacity for Boronda, Salinas, Castroville, Moss Landing, and North and South County growth
- Assure the safety and quality of recycled water
- Maintain and improve the human, physical and fiscal assets of the agency

2.1.2 Integrated Regional Water Management Plan Project Sponsors

Several stakeholders are also project sponsors and are listed in **Table 2-2**. **Table 2-4** describes the responsibilities of these entities.

Table 2-2: Project Sponsors

Entity		Description of Authority/Interests
Big Sur Land Trust (representing California Department of Parks and Recreation, The Nature Conservancy, and the Monterey Regional Park District)	BSLT	The Big Sur Land Trust, a Carmel-based non-profit organization, has protected more than 30,000 acres of spectacular landscapes along the Big Sur Coast, Monterey Bay shoreline, and other special places in Monterey County. BSLT is coordinating planning efforts among several agencies to restore floodplain habitat and reduce flooding along the Lower Carmel River.
California American Water	CAW or Cal-Am	CAW is a for-profit corporation that provides approximately 95% of the potable water supply within the MPWMD boundaries. MPWMD and CAW co-sponsor the Aquifer Storage and Recovery Project in the Seaside Groundwater Basin.
Carmel River Watershed Conservancy	CRWC	As a non-profit corporation, the CRWC strives to coordinate diverse stakeholder interests in the region to protect natural resources in the Carmel River watershed. CRWC is coordinating a Volunteer Monitoring Project in the Carmel River watershed.
Monterey County Service Area 50/Monterey County Water Resources Agency	CSA 50/MCWRA	CSA 50 provides flood control services(levees, pumps) and storm drain maintenance, and is supported through property taxes and services charges. MCWRA provides technical staff to CSA 50 and is cooperating with BSLT and MPWMD on planning for a project to restore floodplain habitat and reduce flooding along the Lower Carmel River.
California State University Monterey Bay	CSUMB	The University is encouraging community outreach programs and developing plans for storm water mitigation, habitat restoration, and protection of sensitive environments in and around its 1,365 acre campus.
Cities of Monterey, Pacific Grove, and Seaside		These cities constitute a major urban service area in the MPWMD district boundary and provide various municipal, including storm water management. The cities are implementing a program to reduce pollutants from urban runoff.
Monterey Bay National Marine Sanctuary	MBNMS	The MBNMS was designated in 1992 as a federally-protected marine area offshore of California's central coast. Stretching from Marin to Cambria, the MBNMS encompasses a shoreline length of 276 miles and 5,322 square miles of ocean, extending an average distance of 30 miles from shore. MBNMS is coordinating a data management program for this area.
Monterey Peninsula Water Management District	MPWMD	MPWMD is responsible for comprehensive management of water resources throughout most of the planning Region and is a co-sponsor with CAW for the Aquifer Storage and Recovery Project in the Seaside Groundwater Basin. MPWMD is also sponsoring an expansion of the existing water conservation program in the Region.
Monterey Regional Water Pollution Control Agency	MRWPCA	MRWPCA provides wastewater treatment services to the Monterey Peninsula cities (except for Carmel-by-the-Sea) and is proposing the Groundwater Replenishment Project in the Seaside Groundwater Basin to recycle a portion of the wastewater treated at the MRWPCA plant on the Salinas River.

2.1.3 Stakeholders

In order to ensure stakeholder support and regional integration, MPWMD has conducted extensive community outreach in the region. These efforts have identified several stakeholders that have or will contribute to or be affected by the suite of projects listed in this Plan. These stakeholders are summarized in **Table 2-3: Stakeholders**, below.

Table 2-3: Stakeholders

Stakeholders	
California American Water	Monterey Bay Citizen Watershed Monitoring Network
California Coastal Commission	Monterey County Service Area 50
California Coastal Conservancy	Monterey Peninsula Regional Park District
California Department of Fish and Game	NOAA Fisheries
California State University Monterey Bay	Pebble Beach Community Service District
California State Water Resources Control Board	Pebble Beach Company
Carmel Area Wastewater District	Planning and Conservation League
Carmel River Steelhead Association	Regional Water Quality Control Board
Carmel River Watershed Conservancy	Resources Conservation District of Monterey County
Carmel Unified School District	Seaside Basin Watermaster
Carmel Valley Association	State Department of Parks & Recreation
City of Carmel-by-the-Sea	Surfrider Foundation
City of Del Rey Oaks	The Nature Conservancy
City of Pacific Grove	The Watershed Institute at CSUMB
City of Sand City	U.S. Army Corps of Engineers
City of Seaside	U.S. Fish and Wildlife Serve
Monterey Bay National Marine Sanctuary	Ventana Wilderness Society

Please note: The following brief descriptions of stakeholder entities are taken, where possible, from documents published by the entities, other public documents or information from the web.

California American Water (CAW or Cal-Am)

CAW is a for-profit corporation that provides approximately 95% of the potable water supply within the MPWMD boundary. CAW operates and maintains most of the water supply infrastructure in the Region, including pumps and pipelines, Los Padres Dam, San Clemente Dam and their associated reservoirs on the main stem of the Carmel River.

California Coastal Commission (CCC)

The CCC is a State agency that regulates development, projects, and activities that can affect the Coastal Zone. The California Coastal Commission was established by voter initiative in 1972 (Proposition 20) and later made permanent by the Legislature through adoption of the California Coastal Act of 1976. The Coastal Commission, in partnership with coastal cities and counties, plans and regulates the use of land and water in the coastal zone. Development activities, which are broadly defined by the Coastal Act to

include (among others) construction of buildings, divisions of land, and activities that change the intensity of use of land or public access to coastal waters, generally require a coastal permit from either the Coastal Commission or the local government.

California Coastal Conservancy

The California Coastal Conservancy, established in 1976, is a State agency that uses entrepreneurial techniques to purchase, protect, restore, and enhance coastal resources, and to provide access to the shore. The Coastal Conservancy works in partnership with local governments, other public agencies, nonprofit organizations, and private landowners. The Coastal Conservancy is actively promoting conservation and restoration projects within the Region and has committed a significant amount of funds for restoration of the Carmel River lagoon and studies concerning the San Clemente Dam Retrofit Project. To date, the Conservancy has undertaken more than 1,000 projects along the 1,100 mile California coastline and around San Francisco Bay.

California Department of Fish and Game (CDFG)

CDFG is a State agency that regulates activities within riparian corridors and is focused on reducing impacts to steelhead in the Carmel River watershed. The mission of the Department of Fish and Game is to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public. The Department of Fish and Game maintains native fish, wildlife, plant species and natural communities for their intrinsic and ecological value and their benefits to people. This includes habitat protection and maintenance in a sufficient amount and quality to ensure the survival of all species and natural communities. The department is also responsible for the diversified use of fish and wildlife including recreational, commercial, scientific and educational uses.

California State University Monterey Bay (CSUMB)

CSUMB was established in 1994 in Fort Ord, one of the Army bases selected for closure by the Base Realignment and Closure Commission. Approximately 4,000 students attend the university, which has a program through the Watershed Institute (see below) for earth systems science majors to perform water-resources related “capstone” projects in preparation of receiving a bachelor’s degree.

Note: see also Foundation of CSUMB and the Watershed Institute at CSUMB

California State Water Resources Control Board (SWRCB)

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. The State Water Board consists of five full-time salaried Members, each filling a different specialty position. Each board member is appointed to a four-year term by the Governor and confirmed by the Senate.

Carmel Area Wastewater District (CAWD)

CAWD is a local special district that was formed in 1908 to provide wastewater collection and treatment in the Carmel and Pebble Beach area. CAWD operates a wastewater collection, treatment, and disposal system to provide sewerage service to the City of Carmel-by--the-Sea, Pebble Beach Community Services District (PBCSD). The CAWD treatment plant is located on the Carmel River and discharges to the Carmel Bay ASBS. CAWD provides recycled water to the Pebble Beach area and discharges a small amount of tertiary-treated water to the Carmel River lagoon to augment lagoon volume during periods when the lagoon is low. See also **Section 3.1.3** for additional information.

Carmel River Steelhead Association (CRSA)

CRSA is a non-profit group and leading advocate for preserving the Carmel River wild steelhead. CRSA is a founding stakeholder of the Carmel River Watershed Conservancy and represents some of the recreational users of the watershed. CRSA is active in promoting and reviewing projects to improve steelhead habitat in the Carmel River and its tributaries.

Carmel River Watershed Conservancy (CRWC)

As a non-profit corporation, the CRWC strives to coordinate diverse stakeholder interests in the region to protect natural resources in the Carmel River watershed. See also **Section 3.1.3** for additional information.

Carmel Unified School District (CUSD)

Carmel Unified School District (CUSD) includes communities of the Monterey Bay. Its 594 square miles encompass some of the most scenic areas of the world, combining the unspoiled natural beauty with the cosmopolitan spirit of one of California's most famous peninsulas. There are four distinctive population centers within the boundaries of CUSD: Carmel-by-the-Sea, Carmel Valley, Pebble Beach, and Big Sur. CUSD is a unified school district grades preK-12 with a current enrollment of approximately 2,166. Three K-5 schools, one 6-8 middle school, one 9-12 high school, a continuation high school and an adult school, along with a NAEYC-accredited Child Development Center serving children aged 6 weeks to 11 years, comprise the district. Carmel Unified School District is a "basic aid" district relying on a generous local property tax base for funding. This school district is involved in several projects along the Carmel River to investigate and monitor the river environment.

Carmel Valley Association (CVA)

CVA is the oldest and largest residents association in Carmel Valley. Established in 1949 as the Carmel Valley Association, the organization quickly changed its name to the Carmel Valley Property Owners Association (CVPOA). In 2002, the general membership voted to revert back to the original name, partly in deference to the many members who rent their residence in Carmel Valley. Membership is open to anyone who lives or owns property in Carmel Valley. There are currently about 850 dues-paying members in CVA.

CVA seeks to protect the interests of residents of Carmel Valley. Overwhelmingly, our membership wants to preserve the rural character and open spaces that make Carmel Valley a special place to live. This sentiment is reflected in our mandate "to preserve, protect, and defend the natural beauty and resources of Carmel Valley and the County of Monterey."

City of Carmel-by-the-Sea

According to the United States Census Bureau, the town has a total land area of 1.1 mi² (2.8 km²). Carmel-by-the-Sea is a small town endowed with a rich artistic history situated on the Monterey Peninsula in Monterey County, California. As of the 2000 census, the town had a total population of 4,081.

City of Del Rey Oaks

Del Rey Oaks, a city of 1,650, is located on the border between Monterey and Seaside. The wooded community was incorporated as a city in 1953, and boasts an almost "fog-free" climate. Although it is zoned almost entirely residential, it is in the process of acquiring property from the former Fort Ord on which to build a major economic development that is anticipated to create about 600 new jobs. It shares zip code 93940 with the City of Monterey.

City of Pacific Grove

Pacific Grove had a total population of 15,522 as of the 2000 census. Sharing borders with the Monterey Bay, City of Monterey, Pacific Ocean, and the Del Monte Forest, Pacific Grove contains several habitat types including marine, littoral, pine forest and mixed oak woodland.

City of Sand City

The town was incorporated in 1960 and had a population of 261 at the 2000 census. The town is located just north of Monterey on the beautiful Monterey Peninsula with over one mile of coastal frontage. The City is currently actively pursuing redevelopment into a mixed commercial/residential village.

City of Seaside

The City of Seaside overlooks the beautiful Monterey Bay and is just north of the City of Monterey. The population in the 2000 census was 31,696 although the most recent estimate (2003) by the U.S. Census shows a population of 33,897.

These Cities provides a variety of services to Monterey Peninsula residents including management of storm water and recreational areas including beaches, parks, and open spaces.

Monterey Bay National Marine Sanctuary (MBNMS)

The Monterey Bay National Marine Sanctuary (MBNMS) is a Federally protected marine area offshore of California's central coast. Stretching from Marin to Cambria, the MBNMS encompasses a shoreline length of 276 miles and 5,322 square miles of ocean. Supporting one of the world's most diverse marine ecosystems, it is home to numerous mammals, seabirds, fishes, invertebrates and plants in a remarkably productive coastal environment. The MBNMS was established for the purpose of resource protection, research, education, and public use of this national treasure. The MBNMS is part of a system of 13 National Marine Sanctuaries administered by the National Oceanic and Atmospheric Administration. The National Oceanic & Atmospheric Administration manages the MBNMS in order to ensure protection of resources, provide for research and education, and facilitate recreational and commercial uses.

Monterey Bay Sanctuary Citizen Watershed Monitoring Network

The Monterey Bay Sanctuary Citizen Watershed Monitoring Network is a consortium of approximately twenty citizen monitoring groups that monitor the health of the watersheds flowing into the Monterey Bay National Marine Sanctuary. It was established in 1997 and has since provided support, training, and a central forum and database for citizen monitoring programs. The Network also coordinates two annual regional monitoring events, First Flush in the fall and Snapshot Day in the spring. This network is facilitated by the MBNMS.

Monterey County Service Area 50 (CSA 50)

CSA 50 is comprised of areas in the 100-year floodplain on the north side of the Carmel River in the vicinity of Highway 1. The Monterey County Board of Supervisors created CSA 50 in 1995 to improve flood control drainage and maintenance of drainage facilities. It is represented by a seven-member committee appointed by the Board of Supervisors from representatives of the area that constitutes CSA 50. MCWRA provides technical staff to the committee. The committee advises the Board of Supervisors and the Public Works Department in all matters of public work regarding CSA 50.

Monterey Peninsula Regional Park District (MPRPD)

The Monterey Peninsula region's ecologically diverse native landscapes, including undeveloped coastal dunes and wetlands, rocky shoreline, redwood canyons, Monterey pine terraces, and mixed hardwood flood plains are a major attraction for residents and visitors alike. The Monterey Peninsula Regional Park District was formed as a special district in 1978 in order to preserve and protect as much of this natural beauty as possible for future generations. The District's mission is to acquire and maintain open space

lands for public benefit and enjoyment, protect the natural character and community value of those lands in perpetuity with best management practices, and to provide educational and interpretive services which open minds to an appreciation and understanding of open space.

See also section 3.1.3.

NOAA Fisheries

The NOAA National Marine Fisheries Service, which is a division of the Department of Commerce, is the federal agency responsible for the stewardship of the nation's living marine resources and their habitat. The Protected Resources Division at the local field office in Santa Rosa (SRFO), California, is responsible for the administration of programs, laws, and acts that promote and support conservation, protection, and recovery of salmonid resources in Central California. The SRFO's primary emphasis is the administration of the Endangered Species Act (ESA) with a specific emphasis on listed salmonids. Currently, listed salmonids include Coho and Chinook Salmon, and Steelhead Trout.

Pebble Beach Community Service District (PBCSD)

Pebble Beach Community Services District is a multi-purpose special district formed on July 1, 1982 by local voters. PBCSD is the local government of Pebble Beach that delivers public services, including fire protection/emergency medical; supplemental law enforcement; wastewater collection and treatment; recycled water storage and distribution and garbage collection services. Under its enabling act, PBCSD can provide many other municipal-type services when requested by the residents, authorized by its Board of Directors ("Board") and approved by the Monterey County Local Agency Formation Commission. PBCSD is governed by a five-member Board that is accountable to the electorate in the same manner as city councils and county boards of supervisors. Directors must be residents of the District and they stand for election every four years.

Pebble Beach Company (PBCo)

The Pebble Beach Company is a for-profit corporation that provides some municipal services, including storm drain maintenance. PBCo is the largest user of recycled water in the Region. MRWPCA provides wastewater services and Cal-Am provides water to businesses and residents.

Planning and Conservation League (PCL)

PCL is the only organization solely devoted to making California a better place to live by lobbying the California State Legislature on a full range of environmental issues and by sponsoring environmental initiatives. An official resolution of the Legislature stated that "participation on every key environmental issue before the State Legislature has demonstrated PCL's effectiveness in preserving the quality of life for all Californians."

PCL is California's only statewide environmental coalition. Founded in 1965 by a group of citizens who were concerned about the uncontrolled development taking place throughout the state and the destruction that accompanied it, PCL has fought for more than thirty years to develop a body of environmental laws that is the best in the United States.

The PCL was actively involved in the development of the Carmel River Watershed Assessment and Action Plan and is a partner with the Coastal Conservancy and NOAA Fisheries in assessing the feasibility of implementing the San Clemente Dam Bypass Option (see section

Regional Water Quality Control Board (RWQCB)

California's Porter-Cologne Water Quality Control Act (1969), which became Division Seven ("Water Quality") of the State Water Code, established the responsibilities and authorities of the nine Regional Water Quality Control Boards (previously called Water Pollution Control Boards) and the State Water Resources Control Board (SWRCB). The Porter-Cologne Act named these Boards "... the principal State agencies with primary responsibility for the coordination and control of water quality" (Section 13001).

Each Regional Board is directed to "...formulate and adopt water quality control plans for all areas within the region." A water quality control plan for the waters of an area is defined as having three components: beneficial uses which are to be protected, water quality objectives which protect those uses, and an implementation plan which accomplishes those objectives (Section 13050).

The federal Clean Water Act (Public Law 92-500, as amended) provides for the delegation of certain responsibilities in water quality control and water quality planning to the states. Where the Environmental Protection Agency (EPA) and the SWRCB have agreed to such delegation, the Regional Boards implement portions of the Clean Water Act, such as the NPDES program and toxic substance control programs.

The Central Coast Region extends from Santa Clara County south to northern Ventura County. The region has 378 miles of coastline, is about 40 miles wide, and includes Santa Cruz and the Monterey Peninsula, the agricultural Salinas and Santa Maria Valleys, and the Santa Barbara coastal plain. Tourism, power and oil production, agriculture and related food processing activities are the major industries. The Regional Board office is in San Luis Obispo.

Resources Conservation District (RCD) of Monterey County

The mission of the RCD is to conserve and improve our natural resources, integrating the demand for environmental quality with the needs of agricultural and urban users. The RCD is guided by a Board of Directors who serve voluntarily and represent a broad spectrum of experience including farming, ranching, financial and non-profit land conservancy management. The RCD provides direct assistance to Monterey County farmers and landowners who work with the RCD on a voluntary basis to protect their soil, water, and natural habitats. The RCD is also a partner with agricultural and natural resource protection organizations and agencies throughout the Central Coast. The RCD of Monterey County was established in 1942 as a non-regulatory special local district, authorized under Division 9 of California Public Resources Code.

This RCD is involved with the BSLT in studying watershed issues in the Carmel Valley.

Seaside Basin Watermaster

A Court-appointed Watermaster was established to administer and enforce provisions of a Final Decision that adjudicated Seaside Basin groundwater rights. The Watermaster consists of 13 voting positions held among nine representatives: CAW, Seaside, Sand City, Monterey, Del Rey Oaks, MPWMD and MCWRA each appoint one representative, and the Landowner Group appoints two representatives. CAW has three voting positions. Seaside, MPWMD, and MCWRA have two voting positions each; and every other representative has one voting position.

State Department of Parks & Recreation

There are six park areas within the Region that allow (or that may allow in the future) recreational opportunities involving water resources, including Asilomar, Carmel River, and Monterey State Beaches, Ft. Ord Dunes, Hatton Canyon, and Pt. Lobos State Reserve.

Surfrider Foundation

The Surfrider Foundation is a non-profit group that is dedicated to the protection and enjoyment of the world's oceans, waves and beaches for all people, through conservation, activism, research and education. Members are interested in the slate of potential desalination projects along the central coast, the Carmel River Restoration Program, and future water supply projects that are described for the Region.

The Foundation of CSUMB

The Foundation of CSUMB is a nonprofit 501(c)(3) public benefit corporation established in July 1994 and is a recognized auxiliary in good standing of the California State University. Foundation operations and services are integral to campus life and provide an important source of net revenue to the University's budget. From FY96/97 to April 2005, the Foundation provided over \$14.2 million to support the campus budget. Additionally, direct Foundation support is provided for a number of University programs and activities, including financing the renovation of residence halls and a new wet lab and classroom facility, recreational field maintenance, campus event services, and community outreach activities.

The Nature Conservancy

The Nature Conservancy is a non-profit group that was founded in 1951 and is a leading conservation organization working around the world to protect ecologically important lands and waters for nature and people. The Monterey County Project was established in 2001 to conserve high-priority sites and critical ecological linkages identified by the Conservancy's scientific planning process.

The Pebble Beach Company

Pebble Beach Company was founded by Samuel F. B. Morse, who was a distant cousin of telegraph-inventor Samuel Finley Breese Morse. In the early 1900s, Morse was a manager for the Pacific Improvement Company; the company had extensive real estate holdings on the Monterey Peninsula. Pebble Beach Company includes three Resorts, four golf courses and more than 1,600 employees. Early in the development of Pebble Beach, Samuel F. B. Morse planned a road system that today allows the public to enjoy unencumbered views and access to the coastline along a substantial portion of the property.

The Watershed Institute at CSUMB

CSUMB, through The Watershed Institute at CSUMB, has taken an active role in the Region with several research and field projects focusing on various aspects of water resource management. The Watershed Institute consists of a direct action community-based coalition of researchers, restoration ecologist, educators, planners, students, and volunteers. These participants all work to promote and employ a systems approach to the management of watersheds around the world.

U.S. Army Corps of Engineers (Corps)

The U.S. Army Corps of Engineers San Francisco District was established in 1866 with authority for river and harbor work on the Pacific Coast west of the Rocky Mountains.

Today the District's area of responsibility covers approximately 40,000 square miles. Most of the territory parallels the Northern California coastline for approximately 600 miles from the Oregon border to just south of Monterey. The Corps protects wetlands through enforcement of Section 404 (b) (1) of the Clean Water Act, which regulates fill in the waters of the United States, and other laws. The San Francisco District is also a leader in coordinating environmental activities with such agencies as the Environmental Protection Agency, U.S. Fish and Wildlife Service, National Marine Fisheries Service, the California Regional State Water Board and the San Francisco Bay Conservation and Development Commission.

The Corps jurisdiction in the Region generally extends to coastal waters up to the spring high tide line and to areas below the ordinary high water mark in the Carmel River main stem and adjacent wetlands.

The U.S. Fish and Wildlife Service (USFWS)

The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people. When species are listed as threatened or endangered under the Endangered Species Act, the habitats or ecosystems upon which they depend are described. The USFWS must, in most cases, officially designate

specific areas as critical habitat for a species when listing it under the Endangered Species Act. Federal agencies must insure that any action they authorize, fund, or carry out is not likely to result in habitat destruction or adverse modification of the designated areas.

In the Monterey Peninsula region, a little more than one-quarter of the Carmel River watershed (primarily, areas adjacent the main stem and in the Garzas Creek and San Clemente Creek watersheds) and a portion of the nearby San Jose Creek watershed is designated as critical habitat for California red-legged frogs¹¹.

Ventana Wilderness Society

Beginning in 1986, Ventana Wildlife Society released bald eagles into Big Sur, California, completely restoring our national symbol to the region. Since 1992, the Research and Education Center at Andrew Molera State Park has filled a vital niche in providing quality outdoor educational experiences for the children and young adults of Monterey County.

The Big Sur Ornithology Lab (BSOL), flagship project of the Ventana Wildlife Society's Conservation Ecology program, was established in 1992 as a long-term avian monitoring station for the central coast of California. BSOL is one of only a few long-term, year-round avian monitoring efforts in North America and one of the only with unrestricted public access. The monitoring efforts of the Big Sur Ornithology Lab play an important role in bird conservation by acting as an early warning system, identifying population declines before they become critical or irreversible. Results from research are used to guide habitat restoration and conservation efforts in order to prevent wildlife from becoming threatened or endangered.

Since 1996, Ventana Wildlife Society has been responsible for reintroducing California condors to the central coast region of California. Ventana Wildlife Society is the only private, non-profit organization in California responsible for restoring the California condor to the wild and continues to play an integral role in the current success of the project nationwide.

Through research, restoration and education programs, VWS is able to provide unique training opportunities for college and graduate students. The experience these young professionals gain not only enables them to move out into the working world with better knowledge and skills, it also helps to create greater stewards of our environment.

Table 2-4 describes the responsibilities of several of the above-listed local entities.

¹¹ See Map 14 California Red-Legged Frog April 2006 Final Critical Habitat Unit MNT-2 and 19244 Federal Register / Vol. 71, No. 71 / Thursday, April 13, 2006 / Rules and Regulations.

Table 2-4: Areas of Interest/Responsibility

Area of Responsibility	MPWMD	MCWRA	MoCo Planning	MRWPCA	BSLT	CSUMB	CAW	CRSA	CRWC	Monterey	Pacific Grove	MBNIMS	CSA 50	Pebble Beach Co.	Seaside Watermaster
Urban Water Supply	✓	✓					✓								✓
Surface Water Protection	✓				✓			✓	✓			✓			
Groundwater Protection	✓	✓					✓								✓
Seaside Groundwater Quality	✓	✓					✓								✓
Carmel River and Aquifer Quality	✓	✓			✓			✓	✓						
NPDES Compliance		✓								✓	✓			✓	
Coastal Conservation										✓	✓	✓		✓	
Storm Water Management		✓			✓	✓				✓	✓	✓	✓	✓	
Land Use Planning			✓		✓	✓				✓	✓				
Nature Conservation					✓			✓	✓			✓			
Carmel River Watershed Protection		✓	✓		✓			✓	✓			✓			
Wetlands Creation					✓				✓						
Environmental Enhancement	✓				✓	✓		✓	✓			✓			
Habitat Restoration	✓				✓	✓		✓	✓			✓			
Aquatic Wildlife Protection	✓	✓			✓	✓		✓	✓			✓			
Carmel River Riparian Corridor	✓	✓	✓		✓	✓		✓	✓						
Flood Response and Protection		✓								✓	✓		✓	✓	
Wastewater Collection and/or Treatment				✓						✓	✓				
Public Recreation					✓	✓		✓	✓	✓	✓	✓		✓	
Public Safety		✓								✓	✓		✓		
Various Public Services		✓	✓			✓				✓	✓		✓		

2.2 Memorandum of Understanding

A draft Memorandum of Understanding (MOU) has been prepared and is proposed for approval by the Water Management Group to acknowledge cooperative efforts in the planning Region and to form an institutional structure to develop and implement the IRWM Plan. The MOU formalizes the collaborative planning effort that these agencies have been involved in for several years, describes a process for completing the IRWM Plan and making amendments in the future, and also describes the role of stakeholders in carrying out the Plan. A copy of this MOU is included in Appendix A. It is anticipated that the MOU will be formally executed in late 2007 or early 2008.

Several stakeholders offered their support during development of the IRWM Plan. **Table 2-5** provides a list of letters of support from stakeholders in the region. Copies of the letters are in Appendix C.

Table 2-5: Letters of Support

Letters of Support
Big Sur Land Trust
Carmel River Watershed Conservancy
City of Carmel-by-the-Sea
City of Pacific Grove,
City of Monterey,
Monterey Bay National Marine Sanctuary
Monterey Regional Water Pollution Control Agency,
Monterey County Water Resources Agency

2.3 Governance of Regional Urban Water Supply Project

MPWMD is coordinating with Monterey County Water Resources Agency (MCWRA), Monterey Regional Water Pollution Control Agency (MRWPCA), Marina Coast Water District (MCWD) and other entities on regional water supply solution opportunities. A Managers Working Group, led by Monterey County, was formed in 2004 and is comprised primarily of General Managers of water/wastewater agencies and cities from the Monterey Peninsula and north Monterey County, including the northern Salinas Valley. The group was formed to discuss a potential governance structure for a regional water supply planning entity currently known as the Monterey Bay Regional Water Authority (MBRWA).

The Managers Working Group has also worked on a draft MOU and scope of work to facilitate development of a regional water supply strategy. This strategy is intended to determine the project – or combination of projects – and project elements that represent the most cost-effective, environmentally sensitive and expeditious solution to this planning Region’s current water replacement need, as well as for future potential supply needs both in the planning Region and in North Monterey County (note that the North Monterey County area is within the geographical region covered by the Salinas Valley IRWMP).

2.4 Central Coast Integrated Regional Water Management

The Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management Plan (IRWMP) is one of six detailed IRWM planning efforts in the Central Coast planning area, which includes watersheds draining to the Pacific Ocean from Santa Cruz to Santa Barbara. These sub-regional planning areas are generally described as

- 1) Central Santa Cruz County through and including the Soquel Creek watershed;

- 2) the Pajaro River watershed in parts of Santa Cruz, Monterey, Santa Clara and San Benito Counties;
- 3) the Salinas River groundwater basin in Monterey County;
- 4) the Carmel Bay, Monterey Peninsula, and southern Monterey Bay watersheds and Seaside groundwater basin in Monterey County;
- 5) San Luis Obispo County;
- 6) Santa Barbara County.

The Central Coast Region is discussing possible realignment of planning areas (see Figure 2-2) and recommendations to DWR for a process to award Prop. 84 and future potential IRWM grant funds throughout the Central Coast. A set of principles was developed and agreed to by the six agencies and include the following:

Central Coast Region Planning Principles

- Cooperate on a regional basis (Central Coast funding area) within the framework of the IRWM process pursuant to Prop 50 (IRWM) and Prop 84 (IRWM).
- To the extent possible, such a process should be consensus based among/across the six planning sub-regions defined in the Central Coast funding area.
- To the extent possible, geographic areas not currently covered by IRWM Plans should be brought into the IRWM planning process in the future and incorporated into adjacent planning areas.
- The six planning sub-regions (participants) agree to take coordinated action and no unilateral action in seeking Prop 84 (IRWM) funds allocated to the Central Coast area.
- The six planning sub-regions agree to coordinate their actions in seeking further Prop 50 (IRWM) funds, including supporting current changes to the State process, but acknowledge the continued competitive nature of the process.
- Benefits from the various funding sources, taken as a whole, should be shared throughout the funding area so that areas that are not funded by Prop 50 are given initial priority in allocating a portion of Prop 84 (IRWM) funds, recognizing that these areas must adhere to IRWM standards and guidelines and have sub-region and regional stakeholder support.

Figure 2-1: Map of Central Coast Funding Region



Figure 2-2: Map of Comprehensive Integrated Regional Water Management Plan for the Monterey Bay Area Watersheds



The agencies responsible for delineating individual planning Regions and developing detailed plans for each region considered these plans and the associated planning regions to be the most feasible initial step in the IRWM planning process. Each regional planning group determined that its specific water management planning needs required an approach that initially focuses on each region's individual watersheds and groundwater basins.

The six detailed plans for the Central Coast will steer the development of a coordinated planning process. Collaborative efforts have been undertaken with representatives from each of the six IRWMP regional groups to ensure overlapping areas and projects are understood and coordinated. This effort demonstrates increased coordination, collaboration, and communication in the Region among Public Agencies, Contributing Entities, and Regulatory Agencies. The desired result is more effectively managed resources, cost efficiencies and better service to the public. Participatory agencies plan to link and integrate the respective IRWM planning efforts and address, at a minimum, water supply, water quality, wastewater, recycled water, water conservation, storm water/flood control, watershed planning and aquatic habitat protection and restoration on a regional scale.

The Greater Monterey Bay IRWMP will be an effort undertaken by local water agencies signatory to a Memorandum of Understanding for Integrated Regional Water Management in the Monterey Bay Area. Three of the four agencies leading efforts to complete IRWMPs in their respective Regions (MCWRA, MPWMD, and PVWMA) have each signed the MOU for development of a comprehensive plan. The status of this MOU at the County of Santa Cruz is not known at this time. In addition, MCWRA is working to engage other key stakeholders in this process, including the County of San Luis Obispo which has jurisdiction over the upper portion of the Salinas River watershed that flows into the area managed by MCWRA.

The Monterey Bay IRWMP, and the associated MOU development, demonstrates increased coordination, collaboration, and communication in the Region among Public Agencies, Contributing Entities, and Regulatory Agencies. The desired result is more effectively managed resources, cost efficiencies and better service to the public. Participatory agencies plan to link and integrate the respective IRWM planning efforts and address, at a minimum, water supply, water quality, wastewater, recycled water, water conservation, storm water/flood control, watershed planning and aquatic habitat protection and restoration on a regional scale. The region, or geographic scope, for the Monterey Bay IRWMP will include the watersheds and associated groundwater basins contributing to Monterey Bay.

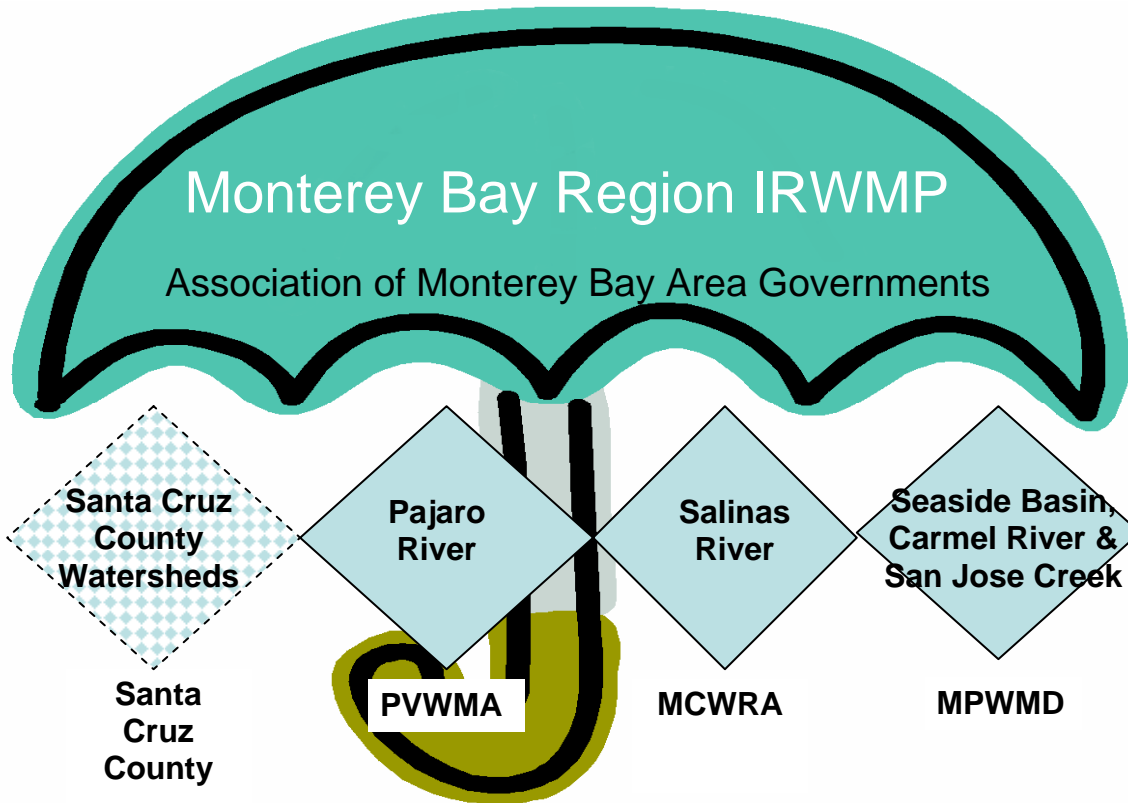
The six goals of the Greater Monterey Bay IRWM planning effort are:

1. To develop a comprehensive IRWMP for the Monterey Bay area that incorporates regional water supply, water quality, flood control, and environmental protection and enhancement objectives consistent with regional IRWM planning efforts currently underway;
2. To improve and maximize coordination of individual water agency plans, programs and projects for mutual benefit and optimal regional gain;
3. To help identify, develop and implement collaborative plans, programs, and projects that may be beyond the scope or capability of a single water agency, but which would be of mutual benefit if implemented among multiple agencies;
4. To facilitate regional water management efforts that include multiple water supply, water quality, flood control, and environmental protection and enhancement objectives;
5. To foster coordination, collaboration and communication between water agencies and interested stakeholders, to achieve greater efficiencies, enhance public services, and build public support for vital projects; and

- 6. To realize regional water management objectives at the least cost possible through mutual cooperation, elimination of redundancy and enhanced competitiveness for State and Federal grant funding.

Below is the conceptual model for the integration of the four regional IRWMPs to a single document for the Greater Monterey Bay Region.

Figure 2-3: Future Regional Planning in Monterey Bay



Chapter 3 Regional Description

IRWM Standard B

This section explains why the region is an appropriate area for integrated regional water management. Included in this section are descriptions of:

- internal boundaries within the region,
- major water related infrastructure,
- major land-use divisions,
- a description of the quality and quantity of water resources within the region,
- water supplies and demand for a minimum 20-year planning horizon,
- important ecological processes and environmental resources within the regional boundaries, and the associated water demands to support environmental needs,
- the social and cultural makeup of the regional community; important cultural or social values, and
- economic conditions and important economic trends within the region.

Also included in this section is a discussion of the plans for a regional planning process throughout the Monterey Bay area.

3.1 General Description

The planning Region is located in Central Coast Regional Water Quality Control Board (RWQCB) Region 3 and lies between the Salinas River groundwater basin and the Big Sur coast. The planning area was established based on geographic, hydrologic, and existing legal responsibilities for water resource management. A map is presented in **Figure 3-1: Map of Monterey Peninsula Integrated Regional Water Management Planning Region**. The planning region is approximately 347 square miles and consists of coastal watershed areas in Carmel Bay and south Monterey Bay between Pt. Lobos on the south and Sand City on the north – a 38.3-mile stretch of the coast that includes three Areas of Special Biological Significance (Pt. Lobos, Carmel Bay, and Pacific Grove). The area encompasses the six Monterey Peninsula Cities of Carmel-by-the Sea, Del Rey Oaks, Pacific Grove, Monterey, Sand City, Seaside, and extends into portions of the unincorporated area of Monterey County in the Carmel Highlands, Pebble Beach and the inland areas of Carmel Valley and the Laguna Seca area.

The planning area is adjacent to the Monterey Bay National Marine Sanctuary (MBNMS). The MBNMS was designated in 1992 as a federally-protected marine area offshore of California's central coast. Stretching from Marin to Cambria, the MBNMS encompasses a shoreline length of 276 miles and 5,322 square miles of ocean, extending an average distance of 30 miles from shore. At its deepest point, the MBNMS reaches down 10,663 feet (more than two miles). It is our nation's eleventh Marine Sanctuary and its largest – larger than Yosemite or Yellowstone National Parks. The MBNMS was established for the purpose of resource protection, research, education and public use. Its natural resources include our nation's largest kelp forest, one of North America's largest underwater canyons and the closest-to-shore deep ocean environment in the continental United States. It is home to one of the most diverse marine ecosystems in the world, including 33 species of marine mammals, 94 species of seabirds, 345 species of fishes, and numerous invertebrates and plants. This remarkably productive marine environment is fringed by spectacular coastal scenery, including sandy beaches, rocky cliffs, rolling hills and steep mountains.

The southeastern portion of the Region includes a part of the Ventana Wilderness, which is in the Los Padres National Forest. The Region includes all the area within the jurisdiction and management of MPWMD, including all the incorporated Cities in the Monterey Peninsula area, a portion of the Carmel Valley, and the Arroyo Del Rey. The Region includes watersheds and groundwater basins that are outside

of the MPWMD political boundary, but that directly influence the quantity and quality of water and water resources.

The population of the Region, which is estimated to be about 115,000, is entirely dependent on local rainfall and runoff for its potable water supply, with no connections to water sources outside of the Region. Climate in the Region is considered Mediterranean, with wide annual swings in precipitation and surface runoff that can result in near desert-like, arid conditions or in periodic downpours resulting in large floods. The average annual runoff of the Carmel River, the largest stream in the Region, was 78,190 acre-feet (AF) for the period of record 1962-2006 (U.S. Geological Survey, measured at U.S.G.S Near Carmel gage, 3.56 River Miles upstream of the Pacific Ocean). No flow reached this station for a 16-month period during the drought of 1976-77 – a condition that was a factor in the destabilization of streamside areas along the Carmel River during subsequent high flows in the years following this drought. The greatest amount of runoff recorded was estimated by the U.S.G.S. at nearly 368,000 AF during the 1982-83 el Niño event. As shown in **Figure 3-2: Total Water Production** total water production from all sources within the Monterey Peninsula Water Management District boundary averaged a little more than 19,000 acre-feet annually (AFA) during Water Years 1996 through 2006 (October 1 to September 30)¹². Population within the MPWMD boundary is estimated at 112,000, which is about 97% of the Region's estimated population¹³.

Approximately 700 AF per year of wastewater from the Carmel Area Wastewater District treatment plant is reclaimed and piped within the Region for turf irrigation, golf courses and other areas in Pebble Beach. The Monterey Regional Water Pollution Control Agency Regional Treatment Plant near the mouth of the Salinas River services a total population of about 250,000, which includes areas both inside and outside of the planning Region, and processes about 22 million gallons per day (MGD). A substantial portion of this flow is tertiary treated, recycled and supplied for irrigation to nearly 12,000 acres of farmland in the northern Salinas Valley. Peak dry weather flow capacity of this plant is calculated at 29.6 MGD, and peak wet weather flows are estimated at 75.6 MGD (note – a 10 MGD rate is equivalent to about 11,200 AF per year).

Total usable storage in the Region, including surface and groundwater, is estimated to be about 37,500 AF. However, usable surface storage at the two main stem reservoirs on the Carmel River represents less than 5% of total storage and is projected to decrease to zero within 40 to 50 years due to the relatively high sediment yield in the contributing watersheds. Direct diversions from surface storage in Carmel Valley are no longer relied on to meet municipal supply. Instead, stored water is released during dry periods from the Los Padres Reservoir to meet instream flow requirements and partially offset environmental damage from groundwater extraction. The lower main stem reservoir (San Clemente Reservoir) has no usable storage during dry periods as the pool of water behind the dam is lowered to reduce the potential for failure during a seismic event (California Division of Safety of Dams requirement). Thus, the Region is mostly dependent on a system of wells to extract groundwater and meet municipal demand for potable water.

¹² Reported and Adjusted Annual Average Water Production Within MPWMD During Water Years 1996 through 2006, Draft, MPWMD, November 21, 2006.

¹³ Monterey Peninsula Water Management District, 2007. Estimate from: <http://www.mpwmd.dst.ca.us/whatis/basics.htm>

Figure 3-1: Map of Monterey Peninsula Integrated Regional Water Management Planning Region

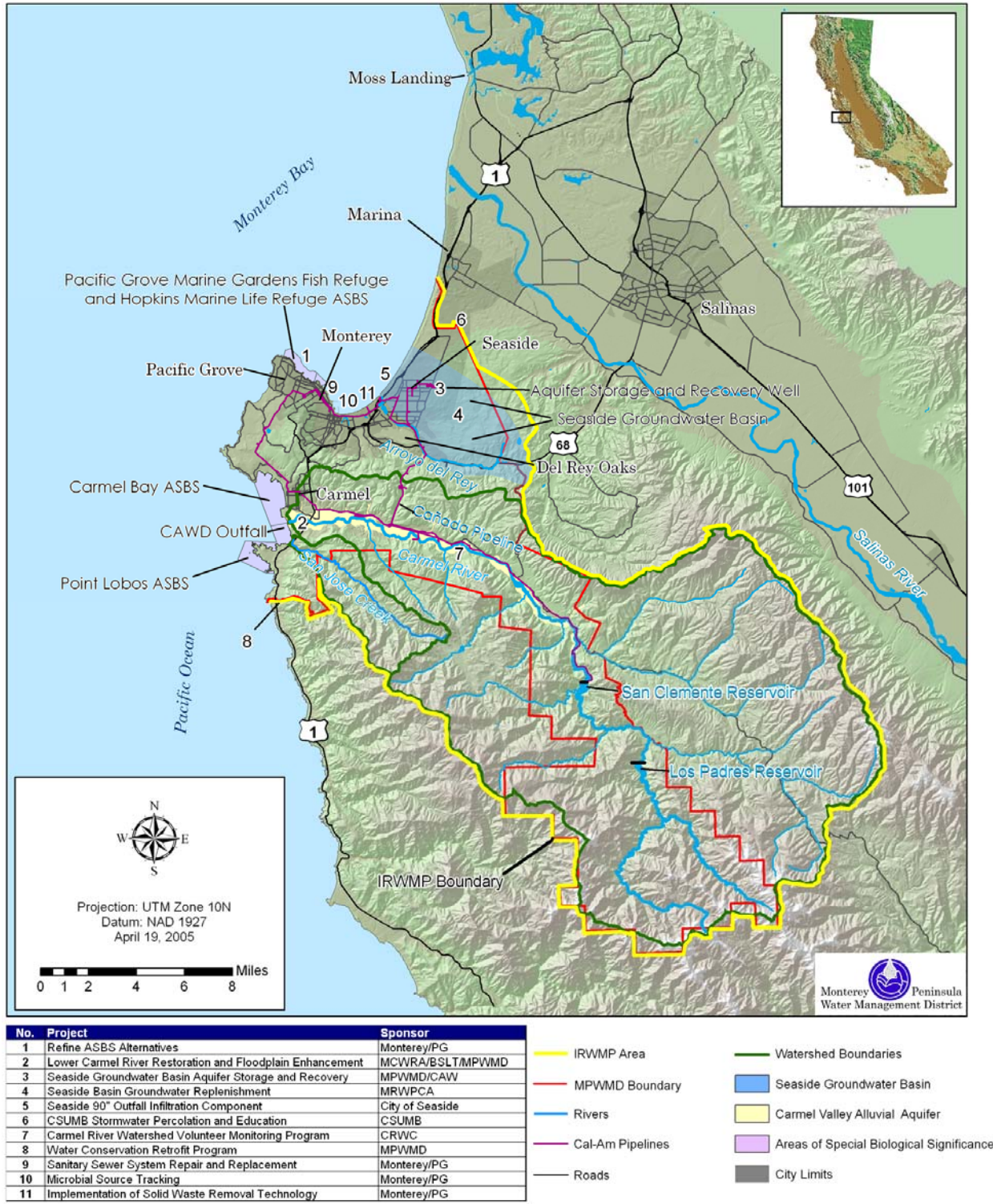
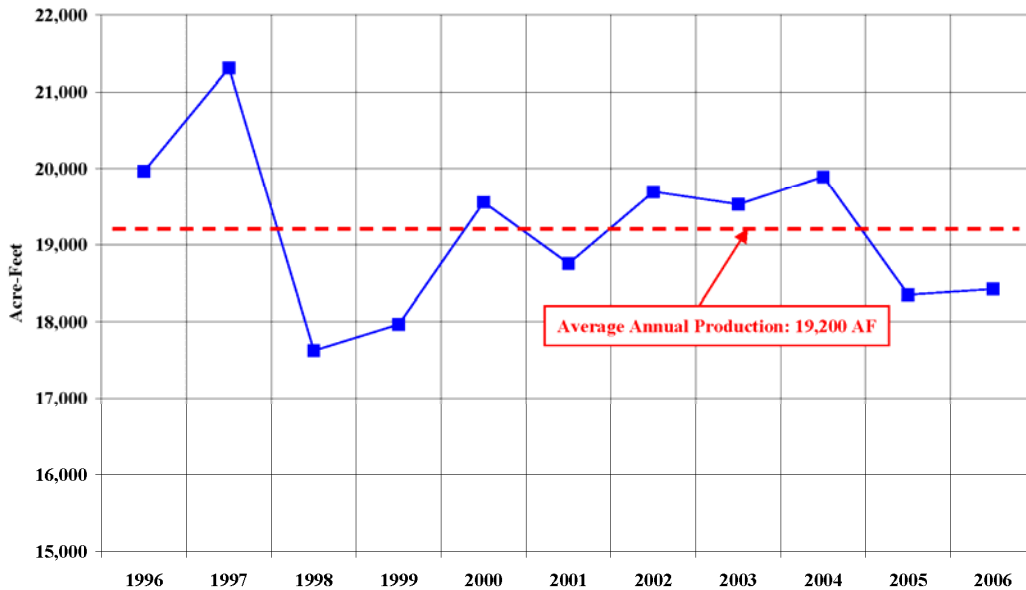


Figure 3-2: Total Water Production
 Within the Monterey Peninsula Water Management District
 Water Years 1996-2006



3.1.1 Regional Watersheds

Except for the Laguna Seca, a sub-basin in the Seaside Basin which has no surface outlet, all the watersheds within the Region flow directly into the Pacific Ocean. Thus, the main stem streams in these watersheds are considered waters of the United States (33 CFR Part 328). The largest watershed in the Region is the 255-square mile Carmel River Basin watershed. Its headwaters originate in the Santa Lucia Mountains at 4,500 to 5,000-foot elevations, descend and merge with seven major stream tributaries along a 36-mile river course, and discharge into Carmel Bay about five miles south of the City of Monterey. About 70% to 80% of the surface runoff in the Carmel River watershed is generated from rainfall within the Los Padres National Forest and Ventana Wilderness. The remaining watersheds (about 92 square miles) within the Region do not currently provide municipal water supply from surface runoff, although groundwater recharge in these basins is an important source for municipal supply.

3.1.2 Groundwater Basins

The two major groundwater resources within the Region are located in the Carmel River Basin (also described by DWR as the Carmel Valley Groundwater Basin) and in the Seaside Basin. Alluvial deposits underlying the Carmel River form the Carmel Valley aquifer. SWRCB Order No. WR 95-10 includes a finding that downstream of river mile 15, the aquifer underlying and closely paralleling the surface watercourse of the Carmel River is a subterranean stream subject to the SWRCB's permitting authority. Groundwater levels within the aquifer are influenced by pumping or production at supply wells, evapotranspiration by riparian vegetation, seasonal river flow infiltration and subsurface inflow, outflow from the basin, and reservoir releases to augment summer low flows. During the dry season, pumping of wells causes significant declines in the groundwater levels and leads to decreased surface flows in the Lower Carmel River along as much as nine river miles. Complete recharge of this aquifer generally occurs quite rapidly after winter rains commence and the Carmel River begins flowing into the dry reaches.

Groundwater production in Carmel Valley outside of the MPWMD boundary is not as well quantified as within the MPWMD area. However, water production records for Water Year 2005 (October 1, 2004 to September 30, 2005) for a portion of this area (Carmel Valley upland area) show that production is about five percent of the volume produced in the alluvial aquifer.

The Seaside Groundwater Basin underlies a hilly coastal plain that slopes northward toward the Salinas Valley and westward toward Monterey Bay. The water-bearing aquifers used for potable water supply extend offshore under the Monterey Bay, but the extent of the aquifers under the bay has not been fully explored. The basin area includes a 19 square-mile area of Sand City, and much of the cities of Seaside and Del Rey Oaks, as well as unincorporated parts of Monterey County. The physiography is characterized by young, active dunes near the coast and mature dunes to the east on the former Fort Ord. Land surface elevations range from sea level at the beach to approximately 900 feet near the eastern boundary of the basin. Recharge to the groundwater system is primarily from infiltration of precipitation, with minor additional amounts contributed by deep percolation of irrigation water, leaky pipes, septic systems, injection wells, and possibly stream flow.

Groundwater conditions in the Seaside basin have deteriorated in the past decade. Groundwater extraction near the coast increased markedly beginning in 1995, resulting in declining water levels and depletion of groundwater storage. Based on detailed analysis of water level trends and groundwater budgets, the estimated sustainable yield of the Seaside Basin under present conditions is 2,880 ac-ft/yr (Yates, 2005). Although there is significant uncertainty in this value, basin-wide groundwater withdrawals in recent years have been on the order of 5,600 ac-ft/yr. In 2006, a Final Decision was rendered that adjudicated the basin and set a three-year goal aimed at reducing annual extractions to 3,000 AFY, which is termed the "natural safe yield."

3.1.3 Internal Boundaries

The internal boundaries of the region include political boundaries of cities and special districts, boundaries for groups within the Region, watershed boundaries that define areas of interest for groups and regulatory agencies, groundwater basins, and other boundaries influencing land uses. They are summarized below and shown in the Regional Land Use Map and Monterey Peninsula, Carmel Bay, and South Monterey Bay Map in **Figure 3-1: Land Use Planning in the Region**.

Political boundaries

- The region includes the coastal cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, and Seaside.

- Also included are the unincorporated portions of Monterey County in Carmel Valley, Pebble Beach, the Carmel Highlands and the Laguna Seca area.

Special Districts and Agencies in the Region

- Monterey Peninsula Water Management District (MPWMD) – formed in 1977 by the California State Legislature for the integrated management of ground and surface water supplies (AB 1329);
- Monterey Peninsula Regional Park District (MPRPD) – formed in 1971 to acquire and maintain open space land. MPRPD's current boundaries cover over 500 square miles and extend beyond the Region up to Marina on the north and south along the Big Sur Coast;
- Monterey Peninsula Airport District – created in 1936. This district is not incorporated into the City of Monterey or Monterey County nor is it a public utility. The Airport District includes portions of Monterey, Pacific Grove, Del Monte Forest, Pebble Beach, Carmel-by-the-Sea, greater Carmel, Del Rey Oaks, Seaside, Sand City, the Monterey-Salinas Highway to Laureles Grade, and the west end of Carmel Valley. The District owns and operates Monterey Airport, a 598 acre facility, serving as a "Medium Non-Hub" airport.
- Carmel Area Wastewater District (CAWD) – formed in 1908 to provide wastewater collection and treatment in the Carmel and Pebble Beach area;
- Monterey Regional Water Pollution Control Agency (MRWPCA) – a joint powers agency formed in 1972 to provide wastewater collection and treatment to the Monterey Peninsula cities (except Carmel-by-the-Sea). MRWPCA also serves areas within its boundaries that are outside of the Monterey Peninsula Region (e.g. Salinas and Castroville).
- Pebble Beach Community Services District (PBCSD) – formed to provide wastewater collection in the Pebble Beach area (PBCSD contracts with CAWD for treatment).
- Community Services Area 50 (CSA 50) – benefit assessment area formed in the lower Carmel River area (Mission Fields/Crossroads) to carry out flood control improvements.

Groups

- Monterey Regional Storm Water Management Program Participating Entities – this group includes the cities of Monterey, Del Rey Oaks, Sand City, Seaside, Pacific Grove, Carmel-by-the-Sea, Marina, the Pebble Beach Company, and the County of Monterey. The group developed a storm water program to comply with the National Pollutant Discharge Elimination System (NPDES) requirements for obtaining a permit to discharge storm water. The Pebble Beach Company has no statutory authority over storm water discharge; however, the organization is participating in the implementation of the program.
- Carmel River Watershed Conservancy (CRWC) – a 501(c)(3) Non-Profit corporation formed in 2005 by the Carmel River Watershed Council, which itself was formed in 1999. This group represents diverse watershed community interests in managing the water resources in the Carmel River Basin. The role of the Conservancy is to raise funding to support the programs, projects and activities of the Council.
- Big Sur Land Trust (BSLT) – formed in 1978 to conserve the significant lands and waters of California's Central Coast for all generations. As of 2003, BSLT had preserved more than 30 thousand acres through government grants and donations.

Groundwater Basins

- Seaside Groundwater Basin – The basin underlies a hilly coastal plain that slopes northward toward the Salinas Valley and westward toward Monterey Bay. The basin area includes Sand City, and much of the cities of Seaside and Del Rey Oaks, as well as unincorporated parts of Monterey County. In addition, the basin underlies most of the land formerly occupied by the Fort Ord military base. The extent of this basin is not well defined under Monterey Bay and a recent investigation describes the location of the flow divide now thought to form the northern and eastern boundaries of the basin as a broad swath, reflecting the uncertainty regarding its exact location and variation in its location with depth. In 2006, the basin was adjudicated and a Watermaster was appointed to manage the basin and bring the groundwater budget into balance.
- Carmel Valley Aquifer (also described in Bulletin 118 by the Department of Water Resources as the Carmel Valley Groundwater Basin, 3-7) – This area has been defined by the Monterey Peninsula Water Management District (MPWMD) and the State Water Resources Control Board (SWRCB) as the water-bearing strata directly associated with the Carmel River. It was originally mapped by the U.S. Geological Survey (USGS) in 1984 and was adopted as the area within the jurisdiction of the SWRCB as described in Order No. WR 95-10 and large-scale maps available at the MPWMD office. The map of the alluvial aquifer is subject to refinement over time based on updated hydrologic information.

Other Boundaries:

- Coastal Zone – this zone generally includes land west of Highway 1 from Sand City south to Del Rey Oaks, but then departs west from Highway 1 and generally follows the coast through Monterey and Pacific Grove. Portions of Pebble Beach, including the Del Monte Forest, most of the City of Carmel-by-the-Sea, and the southwest corner of the Region are also included within the Coastal Zone. The zone includes shore areas within the tidal zone. Regulations of the California Coastal Act apply to land uses within this area.
- Monterey Bay National Marine Sanctuary (MBNMS) – The entire coastline within the Region lies within the MBNMS.
- California American Water (CAW) Monterey District Service Area – CAW serves about 95% of the residents and businesses within the MPWMD boundary. The Service Area is shown in Appendix D.

Table 3-1 summarizes responsibilities for water management in the Region.

Table 3-1: Public Entities and Water Purveyors with Water Resources Authority in the Region

Area of Responsibility	MPWMD	CAL-AM	CAWD	CDFG	COASTAL COMMISSION	DHS	DWR	JURISD	MCHD	MCWD	MCWRA	MRSWMG	MRWPCA	NOAA FISHERIES	PUC	RWQCB	Seaside Watermaster	SWRCB	USACE	USFWS
Is Directly Accountable to Local Voters for Water Management Issues	✓																			
Plans and Constructs Water Supply Projects	✓	✓													✓					
Manages and Protects Regional Water Supply for Monterey Peninsula	✓																			
Conveys/Stores/Treats/Distributes Drinking Water		✓						✓												
Regulates/Monitors Cal-Am Water Production Levels/Sources	✓			✓										✓			✓	✓		✓
Regulates/Monitors Private Water Production Levels/Sources	✓													✓			✓			
Monitors Carmel Valley for Seawater Intrusion	✓																✓			
Reviews/Evaluates Water Development Proposals (Due to Water Production Impacts)	✓			✓	✓	✓			✓					✓		✓				✓
Monitors/Conducts/Funds Environmental Mitigation Programs Required	✓	✓																		
Secures Water Rights for Water Sources	✓	✓															✓			
Approves Cal-Am Water Rates															✓					
Facilitates CAWD/PBCSD Reclaimed Water Project	✓		✓																	
Monitors Local Surface and Ground Water Quality	✓	✓						✓									✓			
Monitors Local Surface and Ground Water Flows and Storage	✓	✓															✓			
Administers Comprehensive Water Conservation and Retrofit Program, Including Rebates and On-Site Inspection	✓																			
Issues Water Distribution System Permits	✓								✓											
Monitors Compliance with Surface and Ground Water Discharge Permit Conditions									✓			✓				✓				
Regulates Drinking Water Quality						✓			✓											
Implements and Manages Water Rationing, as Necessary	✓																✓			
Monitors/Restores Carmel River Riparian Habitat	✓													✓						
Monitors Cal-Am Compliance with Endangered Species Act & Other Laws				✓										✓						✓
Manages Steelhead Fishery	✓	✓		✓										✓						
Conducts Land Use Planning								✓			✓									
Regulates Activities in Streams and Riparian Corridors	✓			✓	✓		✓	✓			✓			✓		✓		✓	✓	✓
Monitors Seaside Basin for Water Quantity and Quality	✓	✓									✓						✓			
Plans and Constructs Recycled Water Projects			✓							✓			✓							

Cal-Am= California American Water
CAWD = Carmel Area Wastewater District
CDFG= Calif. Department of Fish & Game
Coastal Commission = California Coastal Commission
DHS = State Department of Health Services
DWR/DSOD= Dept. of Water Resources/Division of Safety of Dams

JURISD= Cities, County and Airport District
MCHD=Mont. County Health Department
MCWD= Marina Coast Water District
MCWRA = Mont. County Water Resources Agency
MPWMD = Monterey Peninsula Water Management District
MRSWMG = Monterey Regional Storm Water Management Group
MRWPCA = Monterey Regional Water Pollution Control Agency

NOAA Fisheries = National Marine Fisheries Service
PUC = Public Utilities Commission
RWQCB=Regional Water Quality Control Board
SWRCB = State Water Resources Control Board
USACE = U.S. Army Corps of Engineers
USFWS = U.S. Fish & Wildlife Service

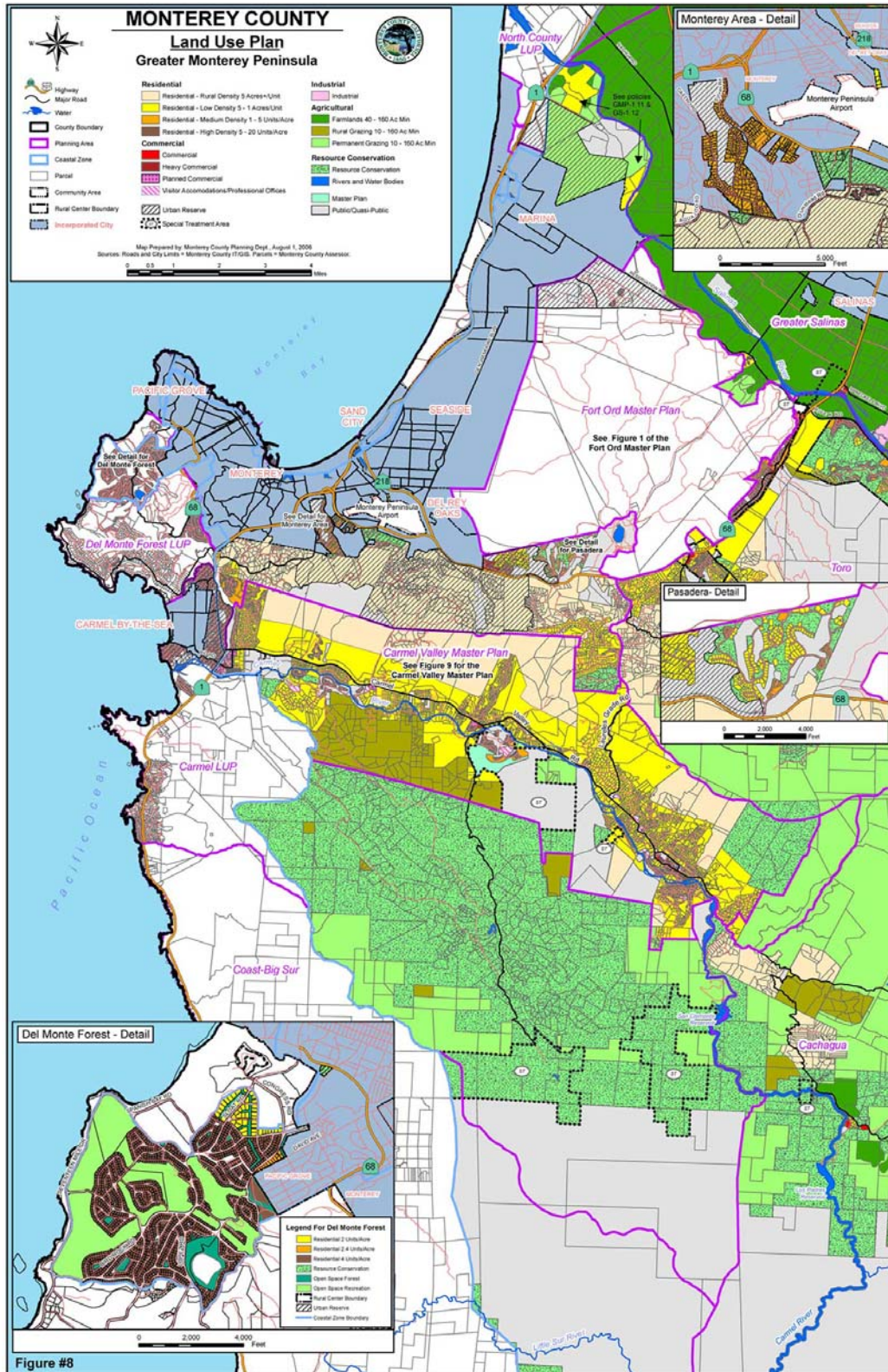
3.1.4 Major Land Uses

The Monterey Peninsula and its surrounding areas are composed of a wide range of land uses that serve residential, commercial, industrial, recreational, and open space purposes. See **Figure 3-3** for land uses in the Region. While Monterey County is dominated by open space and agriculture uses—together they comprise 85% of countywide land—only a small fraction of agriculture takes place in the planning region.

Similar to many watersheds along the Central Coast of California, commercial and residential development is the densest near the coast and progressively lessens in the upstream direction of the watershed. Land use in the 255-square mile Carmel River watershed includes wilderness, viticulture, grazing, recreation (golf courses and park areas), and sparse residential, suburban, commercial and light industrial. Very little of the watershed is currently in traditional agricultural use. Urban development in the region is concentrated primarily in the coastal cities - the Monterey Peninsula is dominated by low density residential lots with some medium density areas within the Cities. Outside of the Cities, low to rural density residential areas dominate, especially along the Carmel Valley and Highway 68 corridors.

Resource conservation makes up another important use of land throughout the region. Parts of the planning area include the Ventana Wilderness and Los Padres National Forest. The Big Sur Land Trust and the Monterey Peninsula Regional Park District have actively promoted land conservation in the watershed through property acquisition and management. The Carmel River Watershed Conservancy has sought to educate the public about resource conservation and has actively participated in various restoration projects.

Figure 3-3: Land Use Planning in the Region



3.2 Current Water Resources

3.2.1 Major Water Related Infrastructure

Water Supply Infrastructure

There are two small main stem reservoirs in Carmel Valley, with the larger of the two (Los Padres Dam and Reservoir at River Mile or RM 24, measured from the ocean) currently estimated to have approximately 1,500 AF of usable storage, which is less than 2% of the annual runoff in the watershed. Usable storage at this location is projected to reach zero within 40 to 50 years at historic rates of sedimentation. Flows released from this facility are used to augment instream flows during the dry season. The San Clemente Dam and Reservoir, built in 1921 at RM 18.6, is nearly full of silt and no longer has usable storage. Although there are facilities to divert and treat water at the San Clemente Dam, no diversions have occurred since May 2003 and DSOD has ordered the dam owner (CAW) to maintain a minimum pool in the reservoir that is below the spillway level in order to reduce the potential for failure during an earthquake.

About 80% of water within the MPWMD boundaries is collected, stored, and distributed by the California American Water Company (CAW or Cal-Am), which serves 95% of the residents and businesses in the Peninsula. Cal-Am owns and operates a series of production wells along the Carmel River and in the Seaside Groundwater Basin (SGB), and a network of pipelines (including the Cañada Pipeline) extending from the San Clemente Reservoir to the Monterey Peninsula and Seaside communities. The CAW service Area Map in Appendix D shows CAW satellite system areas outside of the main Carmel Valley and Monterey Peninsula system.

MPWMD owns two test injection wells in the coastal area of the SGB that are used to inject excess winter flows from the Carmel River via the CAW distribution system.

Wastewater/Recycled Water Infrastructure

Wastewater from all the cities in the Region (except Carmel-by-the-Sea), unincorporated areas along Highway 68, and from communities outside of the Planning Region—including Castroville, Marina, Moss Landing, Salinas, and portions of the former Ft. Ord—is treated at the MRWPCA Regional Treatment Plant near the mouth of the Salinas River. This plant services a total population of about 250,000 and processes about 22 million gallons per day (MGD). In 1992, MRWPCA and the MCWRA formed a partnership to build two projects: a water recycling facility at the Regional Treatment Plant (currently known as the Salinas Valley Reclamation Plant) and a distribution system including 45 miles of pipeline and 22 supplemental wells. The distribution system is called the Castroville Seawater Intrusion Project (CSIP). Its objective was to retard the advancement of seawater intrusion by supplying recycled water for irrigation to nearly 12,000 acres of farmland in the northern Salinas Valley in lieu of groundwater that was currently in use. This would significantly reduce the draw of water from the underground aquifers. The \$75 million projects were completed in 1997 after three years of construction, and highly treated wastewater (meeting Title 22 requirements for unrestricted reuse) is currently used for irrigation.

Peak dry weather flow capacity of the Regional Treatment Plant at the MRWPCA plant is calculated at 29.6 MGD, and peak wet weather flows are estimated at 75.6 MGD. Treated municipal wastewater not recycled is discharged to the Pacific Ocean through an 11,260 foot (3,432 m) outfall/diffuser system. The outfall terminates in the Monterey Bay in approximately 100 feet (30.5 m) of water. The minimum dilution of the outfall is 145:1 (parts seawater to effluent).

Wastewater from Carmel-by-the-Sea, parts of unincorporated Carmel Valley, and Pebble Beach is treated at the Carmel Area Wastewater District (CAWD) plant located at the mouth of Carmel Valley adjacent to the Carmel River. According to a June 2001 summary, CAWD provides wastewater collection, treatment,

and disposal services to approximately 10,000 customers. At the time, CAWD estimated flows to be 1.44 MGD. Approximately 700 AFA of wastewater from the CAWD treatment plant is reclaimed and piped within the Region for turf irrigation, golf courses and other areas in Pebble Beach. The reclamation project was completed in 1994 at a cost of \$34 million and recently required approximately \$32 million to retrofit to handle high sodium concentrations (due in part to residential water softeners). The retrofit will completely eliminate the existing use of 300 AFY of potable water on Pebble Beach area golf courses and athletic fields by 2009.

Treated municipal wastewater not currently recycled is discharged to the Pacific Ocean through a 600-foot (183 m) outfall diffuser system. In 2006, CAW completed an agreement with CAWD to discharge a portion of this flow upstream of the Carmel River lagoon to augment groundwater inflows during dry periods. The plant outfall terminates in Carmel Bay within the Monterey Bay National Marine Sanctuary in approximately 36 feet (11 m) of water. The minimum initial dilution of the outfall is 121:1. The maximum design flow of the plant and outfall is 4.0 MGD. The remainder of the Region is on individual septic systems.

Table 3-2: Major Water Infrastructure by Entity

Agency Name	Major Water Infrastructure and/or Resources
California State Parks	Carmel River Lagoon
Carmel Area Wastewater District	conveyance facilities, pumping plants, wastewater treatment plants, water recycling plant
Monterey Regional Water Pollution Control Agency	conveyance facilities, pumping plants, wastewater treatment plants, water recycling plant
Pebble Beach Community Services District	conveyance facilities, pumping plants (contracts with CAWD for wastewater treatment)
Cities of Carmel-by-the-Sea, Del Rey Oaks, Pacific Grove, and Pebble Beach Company	Storm water conveyance facilities
City of Monterey	water bodies, flood control facilities, conveyance facilities, pumping plants, storm water conveyance facilities
City of Seaside	Storm water conveyance facilities, groundwater production wells, municipal supply conveyance facilities, water treatment plant, pumping facilities
Monterey County Service Area 50	Carmel River property and levees
Big Sur Land Trust	Carmel River property, levee, major landholder in Carmel River watershed, including wetland areas
California State University at Monterey Bay	Storm water conveyance facilities
California American Water	groundwater production wells, municipal supply conveyance facilities, water treatment plants, pumping facilities, dams and reservoirs (open lakes)
Monterey Peninsula Water Management District	test injection wells in Seaside Basin
Monterey Peninsula Regional Park District	Carmel Riverfront property, major landholder in Carmel River watershed, including wetland areas

3.2.2 Surface and Ground Water Resources

The Carmel River Basin, which has an average annual runoff of 77,240 AF, supplies about 70% of the MPWMD area domestic water supply. The water supply reservoirs on the main stem of the Carmel River are owned by California American Water, but generally water from this source is pumped by Cal-Am to the Monterey Peninsula through a well field in the alluvial aquifer downstream of the San Clemente Dam. During the rainy season, river flow is often unregulated by main stem reservoirs, which have a maximum combined storage capacity of less than 2% of the average annual flow in the watershed. Flow releases in the dry season from the Los Padres Reservoir in Carmel Valley are used conjunctively to meet flow requirements in the Carmel River for steelhead and to augment natural flows along the riparian corridor. To reduce impacts to streamside areas from water extraction, flow diversions for municipal supply generally occur at the farthest downstream production wells and progress upstream in response to demand.

To meet municipal demand above the level that can be supplied from the Carmel River Basin, water is pumped from a well field in the Seaside Groundwater Basin. In the Carmel River Basin, groundwater pumping results in up to nine miles of dewatered Carmel River annually in summer and fall, which is a factor in the SWRCB Order No. WR 95-10 to reduce pumping from the Carmel River Basin. To the extent feasible, production from the Seaside Basin is maximized to reduce pumping from Carmel Valley. However, groundwater in the Seaside Basin is limited and a recent adjudication ordered an eventual reduction in the annual rate of extraction in order to address over-pumping in the groundwater basin.

CAW also operates satellite water supply systems along the Highway 68 corridor to supply those areas. These distribution systems are dependent on groundwater extraction (see CAW Service Area Map, Appendix D)

3.2.3 Storm water

MPWMD investigated the potential for capture and reuse of storm water in the Region (outside of the Carmel River watershed) and estimated an average annual runoff volume of approximately 2,400 AF in urbanized areas. This was based on a runoff volume of 10% of an annual rainfall total of 18 inches over the Monterey Peninsula (MPWMD, August 2000).

3.3 Quality and Quantity of Water Resources within the Region

3.3.1 Water Quality

Regional efforts have focused on monitoring water supply levels and water quality changes over time. Existing monitoring efforts in the region have been very successful in generating data necessary for the public, water managers, and relevant regulatory agencies to understand and plan.

Water quality monitoring has taken place in four main areas of the planning region:

- Carmel River Basin Surface Water
- Carmel Valley Aquifer
- Seaside Coastal Subareas
- Monterey Bay National Marine Sanctuary

MPWMD maintains groundwater and surface water monitoring in the Carmel River Valley and Seaside Coastal sub-areas. Ambient conditions in surface waters are measured by dissolved oxygen, carbon dioxide, pH, temperature, turbidity, conductivity, and salinity, while groundwater is monitored for specific conductance, total alkalinity, pH, chloride, sulfate, ammonia nitrogen, nitrate nitrogen, total organic carbon, calcium, sodium, magnesium, potassium, iron, manganese, orthophosphate, and boron.

MPWMD will continue to track future data for trends that might indicate significant changes in concentrations of these or other constituents in surface and groundwater resources.

Carmel River Basin Surface Water

MPWMD has found that, in general, dissolved oxygen, carbon dioxide, and pH levels in the main stem of the Carmel River have met Central Coast Basin Plan objectives set by the California Regional Water Quality Control Board. However, average daily water temperature during the late summer and fall commonly exceeds the range for optimum steelhead growth (50-60°F). Monitoring stations in the flowing portions of the river (i.e., excluding the Lagoon and main stem reservoirs) show that water temperature during these months remains in a stressful range and can reach levels that threaten aquatic life (above 70°F). Linear trend analysis of data from the eight-year period between 1996 and 2004 at the Garland Park station, where water temperature annually exceeds 70°F, shows a slight downward trend in maximum daily water temperature. This may be due to the recovery of the riparian zone upstream and the shade it provides along the river. Water temperature in winter and spring is frequently in the range that is considered optimum for steelhead growth.

Turbidity in the main stem is normally low, except during winter when storm runoff events can elevate turbidity for several days during and after a storm event. Very wet years, such as in 1998, can cause extensive landslides and bank erosion, which can increase turbidity in the main stem for up to several months. More recently, in the reach immediately downstream of the San Clemente Dam, it appears that fine sediment released from the reservoir during drawdown operations has increased turbidity at the Sleepy Hollow weir. This condition is likely to worsen in the near term as the reservoir foreslope, which is comprised of very fine silt particles, fans out and progrades (moves downstream) to the dam spillway.

Water quality in the Carmel River Lagoon typically declines during late summer and fall as freshwater inflows cease and ocean waves start to overtop the sandbar at the mouth of the river. Water temperature often exceeds 70°F, which is above Central Coast Basin Plan guidelines. Dissolved oxygen levels also periodically drop below guidelines (not less than 7.0 mg/L), probably due to a combination of increasing water temperature and decomposition of marine organic material washed into the lagoon by high Ocean waves (MPWMD, 2004).

Carmel Valley Aquifer

As of 2004, monitoring activities have indicated only minor changes in overall water quality in recent years. MPWMD is particularly interested in monitoring for potential sea-water intrusion at the mouth of the Carmel River. To that end, an array of three wells completed at different depths is located at the Carmel River State Beach parking lot, approximately 375 feet from the shoreline. Results show that specific conductance was lower in the shallow well in Fall 2004 relative to Fall 2003, higher in the intermediate depth well, and slightly higher in the deepest well. However, specific conductance is significantly lower in all three wells in Fall 2004 relative to the 14-year highs during the last extended drought. The higher values observed early in the sampling program are at least partially attributable to the fact that there was no fresh water inflow to the lagoon for approximately four years (April 1987 until March 1991).

Seaside Coastal Subareas

Monitoring results indicate no remarkable changes in general constituent concentrations in the Seaside coastal subarea over the period of record for the existing monitoring wells. There is also no indication of seawater intrusion in the two principal aquifer units - the Paso Robles Formation (i.e., shallower unit) and Santa Margarita Sandstone (i.e., deeper unit) - in this area of the Seaside Basin at the present time. One well that showed a 23 percent increase in specific conductance from 2002 to 2003, increased an additional eight percent from 2003 to 2004. Results from this single well are not considered a significant indicator of

potential seawater intrusion because this well is the shallowest of a pair of monitoring wells completed at the same location and these are not near the coastline.

Monterey Bay National Marine Sanctuary

Monitoring and analysis in both the near shore environment and coastal watersheds has pointed to urban runoff as the leading cause of water pollution affecting the MBNMS. This monitoring has revealed high concentrations of nutrients, metals, pathogens, detergents and other contaminants in local creeks and rivers as well as in the numerous urban outfalls that drain into the MBNMS. Growing evidence suggests that these contaminants are having an adverse impact on MBNMS resources. Toxicity analysis has shown that in most locations sampled, urban runoff is toxic to test organisms representative of those found in the MBNMS, and research into increased mortality among the threatened southern sea otter population suggests that protozoa introduced to the marine environment via runoff from land-based sources may contribute to this mortality rate.

The cities participating in the Monterey Regional Storm Water Management Program (MRSWMP) and the MBNMS Water Quality Protection Program (WQPP) have sought to reduce non-point source urban runoff through a combination of end-of-pipe treatments and source control programs through the implementation of the Sanctuary's Urban Runoff Plan, the Model Urban Runoff Program (1996), and now the MRSWMP. The projects contained in these plans and programs recognize that certain pollutants associated with urban runoff can partially be controlled by end of pipe best management practices such as swales, filters and retention basins. A cost-effective and comprehensive program must also target contamination at its source by addressing the multitude of behaviors and activities that introduce this type of pollution.

3.3.2 Water Quantity

Monterey Peninsula Water Resources System (MPWRS)

The Monterey Peninsula Water Resources System (MPWRS)¹⁶ includes surface water in the Carmel River and Los Padres and San Clemente Reservoirs and groundwater in the Carmel Valley Aquifer, which are in the Carmel River Basin (CRB), and groundwater in the coastal subareas of the Seaside Groundwater Basins. The maximum storage capacity of the MPWRS at this time is 37,515 acre-feet. The two relatively small reservoirs on the Carmel River, Los Padres and San Clemente, have been severely impacted by sedimentation. Los Padres Reservoir storage is currently estimated at slightly less than 1,500 acre-feet. San Clemente Reservoir, which holds about 30 acre-feet at the spillway level, is not operated for municipal supply. The MPWRS contains the majority of water resources within the planning Region.

In the 2006 Water Year (October 1, 2005 to September 30, 2006), CAW produced 14,663 acre-feet (AF) within the Region. Another 4,168 AF were produced from non-CAW sources. CAW supplied approximately 75% of its demand from Carmel Valley, 22% from the Seaside Groundwater Basin and 3% from other sources. The estimated total use within the Region (all sources) was a little more than 18,800 AF.

Since 1997, Cal-Am's main system has averaged approximately 10,900 acre-feet of water production per year from its Carmel River sources, which represents about 75% of its total annual production. The

¹⁶ Defined by MPWMD as lands which overlie or are contiguous to (in whole or in part) water in the Carmel River (mainstem and tributaries), ground water within the alluvial aquifer, and groundwater within the Seaside Coastal Ground water Subbasin, as identified on MPWMD Boundary Map #1; or the ground water and surface water supplies which serve Cal-Am, other water distribution systems, and private well owners within the District, including the surface water and groundwater resources of the Carmel Valley (both the Carmel River and the Carmel Valley Aquifer) and the resources of the Seaside Coastal groundwater subbasin. This definition excludes resources of the Seaside Inland groundwater subbasin, and the Carmel Valley upland formation.

remaining 25% or approximately 3,700 acre-feet per year is produced from Cal-Am's wells in the coastal subareas of the Seaside Groundwater Basin.

Carmel River Basin

The 255-square-mile Carmel River Basin includes the Santa Lucia Mountains to the south and the Sierra del Salinas to the north. The mean annual rainfall varies from about 14 inches along the northeast perimeter of the basin, to over 40 inches in the high peaks of the southernmost portion of the basin. The average annual runoff on the Carmel River at U.S.G.S gage Near Carmel (3.56 River Miles upstream of the Pacific Ocean) was 78,190 acre-feet (AF) for the period of record 1962-2006 (U.S.G.S., 2006).

The Carmel Valley aquifer, which underlies the alluvial portion of the Carmel River downstream of San Clemente Dam, is about six square-miles and is approximately 16 miles long. It varies in width from 300 to 4,500 feet and in thickness from about fifty feet near Carmel Valley Village to approximately 150 feet near Highway 1. The thickness of the alluvium averages 75 feet and is adequately defined by well logs (U.S.G.S. 1984). In the spring and summer, the alluvial aquifer is drawn down by private pumpers and California American Water (CAW), which results in dewatering of the lower six miles of the river for several months in most years and up to nine miles in dry to extremely dry years. Recharge of the aquifer is derived mainly from river infiltration which composes 85 percent of the net recharge. The aquifer is recharged relatively quickly during normal rainfall years.

In 1995, the State Water Resources Control Board issued Order No. WR 95-10, which limited CAW to 11,285 acre-feet of diversions from the Carmel River Basin and ordered CAW to maximize diversions (to the extent feasible) from the Seaside Groundwater Basin (SGB), which includes the Northern Coastal, Northern Inland, Southern Coastal, and Laguna Seca subareas.

Seaside Groundwater Basin (SGB)

The SGB has been characterized as underlying an approximately 19-square-mile area at the northwest corner of the Salinas Valley, adjacent to Monterey Bay. The hydrogeology of the Seaside Basin has been the subject of numerous studies for more than 30 years. The more significant of the hydrogeologic studies begins with a study by the California Department of Water Resources in 1974. Reliable monitoring data gathered since 1987 shows that water levels have been trending downward in many areas of the basin. A steep decline since 1995 in the northern coastal basin, where most of the groundwater production occurs, has coincided with increased production in that area after implementation of SWRCB Order No. WR 95-10.

Yates et al. (2005), hydrology consultants for MPWMD, completed a detailed analysis of water level trends and groundwater budgets and estimated the sustainable yield of the Seaside Groundwater Basin at 2,880 acre-feet/year (AFA) and the usable groundwater storage capacity at 6,200 AF. The main limitation on yield in the SGB is the risk of seawater intrusion, which may reach production wells before the groundwater budget can be brought into balance. It is known that the coastal aquifers extend under Monterey Bay, but the limits have not been determined. An overview of groundwater conditions in the Seaside Basin is given in **Table 3-3**. Under the current MPWMD water supply budget, CAW is limited to 3,500 acre-feet of production annually from the coastal subareas of the SGB for customers in its main system. Satellite systems in the inland subbasins have a production limit of 345 AFY.

Adjudication of the Seaside Groundwater Basin occurred in 2006 with a Final Statement of Decision filed on March 27, 2006. The court ordered the formation of a Watermaster and mandated a "physical solution" to the overdraft problem. The operating yield for three (3) years beginning in March 2007 for the Seaside Basin as a whole was defined as 5,600 acre feet (Coastal Sub area is 4,611 acre feet and 989 acre feet for the Laguna Seca Sub area). The judgment required that the operating yield for coastal subareas (4,611 AFY) be decreased by 10% every three years starting in year four, e.g. 10% decrease at the start of the fourth year for years four, five, and six, and an additional 10% decrease at the start of the

seventh year for years seven, eight and nine, etc. These decreases will continue until production reaches the “natural safe yield”, which was initially set at 3,000 AFY, unless the Watermaster (1) has secured an equivalent amount of “non-native” replacement water and added it to the basin, or (2) the Watermaster has secured an equivalent amount of recycled water and contracted with one or more of the producers in the basin to use this quantity of recycled water in lieu of their production allocation with the producers agreeing to forego their right to claim a storage credit for their forbearance, or (3) any combination of replacement or recycled water results in the required decrease in production of “native water” in the basin, or (4) water levels in the aquifers are sufficient to ensure a positive offshore gradient to prevent seawater intrusion.

In the event the Watermaster cannot procure replacement water to offset operating yield over-production in an administrative year, production in the following administrative year must be curtailed to the targeted operating yield or a replenishment assessment may be levied on the producers.

In compliance with the judgment entered in the SGB adjudication, the “Seaside Monitoring and Management Program” (Program) was adopted by the Seaside Basin Watermaster in May 2006 to ensure that the SGB is protected and managed as a perpetual source of water for beneficial uses. The Program sets forth actions that will be taken to: (a) monitor current overdraft conditions and the present threat of potential seawater intrusion into the Coastal Subarea of the Basin; (b) develop and import supplemental water supplies for the purpose of eliminating Basin overdraft and the associated threat of seawater intrusion, and (c) establish procedures that will be implemented to address seawater intrusion should seawater intrude into the onshore portions of the Basin. Key elements of the Basin Management Program include: a) a monitoring component that builds on MPWMD’s efforts to collect and organize data regarding groundwater production, water levels, water use, land use, rainfall, and other pertinent information; b) development of an enhanced Seaside Basin groundwater model; c) development of recommendations regarding implementation of strategies to import supplemental water supplies into the basin; and d) development of strategies for redistribution of pumping to avoid various adverse impacts within the basin.

Groundwater is produced by 35 wells for 16 well owners in the Seaside Groundwater Basin. Of these 16 well owners, California American Water (Cal-Am), an investor-owned public utility that serves approximately 38,480 customers in the Monterey Peninsula area, owns 12 wells and pumps approximately 70% of the water produced in the basin. The City of Seaside is the second largest producer in the basin with three wells that pump about 17% of the water that is produced in the basin. The City of Seaside operates two systems; the Municipal Water System that serves approximately 790 customers within the city and a Golf Course System that provides non-potable water to Black Horse and Bayonet golf courses.

Cal-Am also owns and operates the Ryan Ranch, Hidden Hills, and Bishop systems in the Laguna Seca Subarea. Cal-Am acquired these systems in 1990, 1993, and 1997, respectively. The Ryan Ranch and Hidden Hills Units have emergency interconnections with Cal-Am’s main system. None of these smaller units are interconnected.

Table 3-3: Current Groundwater Conditions of Seaside Basin

Subbasin	Subarea	Current Groundwater Conditions	Sustainable Yield (ac-ft/yr)
Northern	Northern Inland	There are very few wells for water-level analysis. There is also no production from this subarea, but groundwater levels have been declining steadily since 1988 at a rate of about 0.7 ft/yr because of pumping in adjacent areas. In other words, the yield from this subarea is already fully used.	1,840
	Northern Coastal	Most of the basin groundwater production is in this subarea. Increased production beginning in 1995 has been mostly from the Santa Margarita aquifer. Pumping troughs have developed in both the Paso Robles and Santa Margarita aquifers, with water-level declines averaging more than 1 ft/yr near the centers of the troughs. Water levels are continuously below sea level in the Santa Margarita aquifer throughout the subarea, with gradients from the ocean boundary toward the pumping trough. The pumping trough in the Paso Robles aquifer is separated from the coastline by a strip where water levels are above sea level.	
Southern	Laguna Seca	Almost all groundwater production is from the Santa Margarita aquifer in the eastern half of the subarea. Water levels in that aquifer have been chronically declining, and Paso Robles water levels are level or slightly declining. There is little production from the western half of the subarea, and a significant amount of groundwater flows from there into the Southern Coastal Subarea. Increased production from the western half would decrease the yield of the Southern Coastal Subarea.	1,040
	Southern Coastal	The basin is relatively thin in this subarea and there are few production wells. There are no noticeable or widespread water-level declines. There appears to be significant outflow from this subarea, some of which flows to the ocean and some to the Northern Coastal Subarea.	
Entire Basin		Basin-wide average annual storage depletion is approximately 1,540 ac-ft/yr.	2,880

Existing Water Supply Replacement Needs

Due to regulatory and judicial constraints on water use within the MPWMD boundary and loss of storage at Los Padres Reservoir (i.e., the MPWRS), there is a current need to replace a substantial portion of existing water supplies with other sources. In 2006, the Monterey Peninsula Water Management District (MPWMD) Board of Directors held a series of workshops to review replacement and future water needs of customers in the California American Water main distribution system in the Monterey Peninsula area. As described in MPWMD Technical Memorandum 2006-02¹⁷, the replacement requirement recommended to serve existing customer demand is 12,500 AFY, or roughly about two-thirds of the annual production from the MPWRS.

¹⁷ MPWMD Technical Memorandum 2006-02, “Existing Water Needs of Cal-Am customers within MPMWD Boundaries and Non Cal-Am producers within the Seaside Groundwater Basin Adjusted for Weather Conditions During Water Years 1996 through 2006,” prepared by Darby W. Fuerst, PH 05-H-1658, Senior Hydrologist.

Recycled Water

The Carmel Area Wastewater District (CAWD) treatment plant located at the mouth of Carmel Valley supplied recycled water (approximately 790 AFY) to irrigate turf at several Monterey Peninsula golf courses and at one local school. Use of this reclaimed water has resulted in a one-for-one decrease in CAW system demand.

MRWPCA treats up to 25,000 AF of municipal wastewater annually, with nearly 9,000 AF coming from within the Planning Region. A portion of this treated water is used outside of the Region to retard seawater intrusion in the Salinas River watershed and to irrigate agricultural land in the northern Salinas Valley.

Other Sources of Water

Other named creeks included in the Region are San Jose Creek and Canyon del Rey Creek. San Jose Creek watershed is 14.2-square-miles with an average annual runoff of 3,335 acre-feet for the period of record from 1999 to 2004. The creek discharges directly to the south end of Carmel Bay. The Canyon del Rey watershed is a 13.8-square-mile watershed within the Seaside Basin with an average annual runoff of 499 acre-feet for the period of record from 1967 to-1978. The creek discharges to Monterey Bay near the Monterey/Seaside boundary. It is not thought to contribute significantly to groundwater recharge in the Seaside Groundwater Basin.

3.4 Water Supplies and Demand for a 20-Year Planning Horizon

In 2006, the Monterey Peninsula Water Management District (MPWMD) Board of Directors held a series of workshops to review the future water needs of customers in the California American Water main distribution system in the Monterey Peninsula area. A Board-appointed Technical Advisory Committee (TAC), comprised of a staff member representing each land use jurisdiction (i.e. the Monterey Peninsula Airport District, County of Monterey, and each city located within the boundaries of the MPWMD), was asked to provide a recommendation on developing a methodology for predicting future water needs.

The TAC recommended using General Plan build-out numbers to project future water needs. After these numbers were provided by each jurisdiction, the TAC met regularly to develop water use factors for various types of anticipated development. After reaching a consensus on water use factors, MPWMD staff compiled the future water need estimates that are summarized in **Table 3-4: Estimated Additional Water Demand (AFY)**.

Table 3-4: Estimated Additional Water Demand (AFY)

	Single-Family Dwellings	Multi-Family Dwellings	2nd Units	Non-Residential	Residential Remodels	20% Contingency	Residential Retrofit Credit Repayment	Total AF of Water Needed
Airport District				115		23		138
Carmel	19	56	25	20	120	48		288
Del Rey Oaks	5			30	5	8		48
Monterey	46	426		123		109	0.526	705
Pacific Grove	73	376	298	260	43	210	3.545	1264
Sand City	48	68		210		60		386
Seaside	133	21	44	283	4	97	0.023	582
Unincorporated County	892			10	37	188	8.134	1135
Total	1216	947	367	1051	209	743	12	4545

These estimates are based on:

1. TAC recommended factors;
2. A contingency of 20 % to cover unanticipated water needs or upgrades from current restrictions; and
3. Water needs associated with “paying back” residential retrofit credits allowed by MPWMD Ordinances No. 70 and No. 90. These Ordinances allowed a jurisdiction to borrow against the next water allocation.

Residential water needs in unincorporated areas within the MPWMD boundary include the TAC-recommended adjusted residential factor that takes into account the County’s larger lot sizes. The result of this effort is an additional long-term water need of 4,545 acre-feet per year to satisfy the build-out projections of regional jurisdictions.

Outside of the MPWMD boundary, the County has proposed new goals and policies in a March 2006 Draft General Plan update. These include assuring an adequate and safe water supply to meet the County’s current and long-term needs. A program to eliminate overdraft of water basins will be developed as part of the Capital Implementation and Financing Plan (CIFP) in the General Plan using a variety of strategies, including but not limited to:

- a. Water banking;
- b. Groundwater management and aquifer recharge and recovery;
- c. Desalination;
- d. Pipelines to new supplies; and
- e. A variety of conjunctive use techniques.

The CIFP will be reviewed every five years in order to evaluate the effectiveness of meeting the strategies noted in this policy. Areas identified to be at or near overdraft will be a high priority for funding. Proposed new developments will be required to demonstrate “... that there is a long term, sustainable water supply, both in quality and quantity, to serve the development.” (2006 Monterey County General Plan Update, March 21, 2006). The plan, when adopted, is intended to cover an approximate 20-year period. It should be noted that this plan update was the subject of several competing measures on the June 2007 Monterey County ballot. Voters said no to a measure to approve the Board of Supervisors-approved update, but also said no to a measure to repeal that update. It is unclear at this time when or how the General Plan may change and if this IRWMP would be affected by the changes.

3.5 Ecological Processes and Environmental Resources

The Region, along California’s central coast on Monterey Bay, includes a diverse assemblage and mosaic of plant and animal species. The wide range of topography, rainfall patterns, different soils, geologic processes, episodic wild fires and landslides, and proximity to marine air in the region has created ideal conditions for endemism and localized genotypic variations in plant and animal species. The planning region is also adjacent to the Monterey Bay National Marine Sanctuary (MBNMS). The MBNMS was designated in 1992 as a Federally-protected marine area offshore of California’s central coast for the purpose of resource protection, research, education, and public use. Included in the MBNMS are four biologically diverse and unique Areas of Special Biological Significance (Pt. Lobos, Carmel Bay, and Pacific Grove).

The Region also contains thirteen stream basins including Wildcat Canyon, Gibson Creek, San Jose Creek, Carmel River, Pescadero Creek, Stillwater Creek, Fan Shell Creek, Seal Rock Creek, Sawmill Gulch Creek, Josselyn Canyon Creek, Aguajito Canyon, Iris Canyon, and Arroyo del Rey. Riparian forest/woodland and meadow habitats are distributed along the bottomland of most stream courses in these watersheds, with exceptions where roads, housing, commercial development and other human activities have encroached or displaced native flora. Low rainfall and inflow during the Mediterranean-type dry season limits the extent of aquatic habitats, but four coastal lagoons and surrounding wetlands persist throughout the year, including the Carmel River Lagoon, El Estero Lake, Del Monte Lake, and Laguna del Rey (Robert's Lake).

Terrestrial vegetation within the region ranges from rocky onshore Coastal Bluff Scrub and Active Dune at elevations near zero to Maritime Coast Range Ponderosa Pine Forest and Santa Lucia Fir Woodland at elevations above 3,000 feet in the upper Carmel River Basin. As highlighted by the California Native Plant Society and the California Department of Fish and Game, several rare, endemic tree species occur in the region including Santa Lucia Fir, Monterey Cypress, Gowen Cypress, Bishop Pine and Monterey Pine.

3.5.1 Threatened, Endangered and Species of Special Concern in the Region

Evolutionary patterns and modern man's tendency to simplify habitats and restrict the range of many species have led to lower reproductive success, survival rates and restrictions of some species' distribution and abundance. As a consequence, there are species within the region that are threatened or endangered. A preliminary assessment of the flora and fauna in this region shows there are 121 special status species including 66 species of plants, 6 plant communities, 30 species of birds, 6 species of reptiles and amphibians, 1 specie of fish, 4 species of insects, and 8 species of mammals classified by the California Department of Fish and Game. Of these special status species, 15 plant species and 10 animal species are formally listed as threatened or endangered under State or Federal endangered species laws. In relation to the IRWMP, 12 special-status animal species are particularly important, including California red-legged frog, South-Central California steelhead trout, Southwestern pond turtle, black legless lizard, California tiger salamander, Western snowy plover, California horned lizard, yellow warbler, black swift, common loon, barn swallow and double-crested cormorant. These animal species inhabit aquatic systems, depend directly on food produced in aquatic habitats, or are distributed in areas where water projects may be planned and constructed. A complete list of special status species is given in Appendix B.

Distribution and Abundance of Special-Status Species

Appendix A contains a complete list of special status species known to occur within the planning region as identified by California Department of Fish and Game, the National Marine Fisheries Service, the United States Fish and Wildlife Service, the California Natural Diversity Database (CNDDB) and the California Native Plant Society. Maps in Appendix D also illustrate the potential distribution of special status species based on habitat type within the planning region boundary and information from the CNDDB.

Federally Threatened Species in the Carmel River

Since 1996, Federal involvement in water resource management within the Region has increased, with special attention given to two aquatic species – the California red-legged frog and south-central California steelhead. Historical water development has reduced potential habitats and along with it, survival and population numbers. The California red-legged frog (CRLF) and south-central California steelhead (SCCS) were listed as threatened under protection of the Federal Endangered Species Act in 1996 and 1997, respectively. The following is a brief description of the status of each species and its relationship to water development in the Region.

California red-legged frog

At just over five inches long as an adult, the California red-legged frog (CRLF) (*Rana aurora draytonii*) is the largest native frog in the western United States. The historic range of CRLF extends from the Sierra foothills to the coast and from Shasta County to the boarder of Mexico, excluding the Coast Range north of Marin County. It is estimated that CRLF have disappeared from over 99 % of the inland and southern California localities within its historic range and have been extirpated from at least 70% of all localities within its entire historic range (Jennings, Hayes, and Holland 1992). CRLF occur throughout the entire Central Valley hydrographic basin, but the area from Ventura County south to the border of Mexico is the most depleted in California (Jennings, Hayes, and Holland 1993). Populations of CRLF in the Coast Range from Marin County south to Santa Barbara are more intact than populations in the rest of the state. The estimated disappearances of historical populations in the Coast Range are 50%. USFWS listed this species as Threatened in 1996. The Carmel River Watershed and the Santa Lucia mountain range have been identified as a core area (number 20), where recovery actions will be focused (USFWS, 2002). Critical habitat throughout California was designated in 2006. In the Monterey Peninsula region, a little more than one-quarter of the Carmel River watershed (primarily, areas adjacent to the main stem and in the Garzas Creek and San Clemente Creek watersheds) and a portion of the nearby San Jose Creek watershed is designated as critical habitat for California red-legged frogs¹⁸.

Surveys and incidental sightings in the Carmel River Basin indicate that CRLF is well distributed throughout the drainage, especially in the main stem (MPWMD, 2004). But mapping of potential reproductive sites and actual sightings of egg masses and larvae in the main stem during 2003 indicates that the population is not fully utilizing the potential or available reproductive habitat. Sampling in selected tributaries within the basin during 1999-2003 surveys also indicates patchy utilization of suitable habitat, as known reproductive sites are not used consistently on a year-to-year basis. Although the distribution and abundance of CRLF may be limited, there is general agreement that the Carmel River Watershed is extremely important to the current distribution of CRLF.

Many factors contributed to the historical decline or loss of CRLF populations in their native range, including introduction of predators, loss of habitat and degradation from urbanization, agriculture, mining, overgrazing, recreation, timber harvesting, invasion from nonnative plants, impoundments, water diversion, and degraded water quality (65 FR 54893). Of special interest in relation to planning in this Region are the impoundments and water diversions in the Carmel River Basin. The existing dams and water extractions are opined to affect CRLF in the following ways:

- San Clemente and Los Padres Dams fragment habitat in the basin by blocking or hindering dispersal of individuals.
- San Clemente Reservoir is nearly filled with sediment which has created favorable off-channel breeding sites in shallow ponds within the reservoir area during times of the year when flow is uncontrolled (i.e., much of the winter). However, to help reduce the threat of a dam failure during a seismic event, DWR requires the dam owner, California American Water, to draw down the water surface during low flow times (i.e., spring, summer, and fall). This can expose tadpoles and cause desiccation of eggs masses in the reservoir area.
- In most years, summer releases from Los Padres Reservoir contribute enough water to the lower alluvial Carmel Valley to help prevent premature draw down of reproductive sites in a portion of the lower Carmel River.
- Water diversions via well pumping in the lower Carmel Valley can significantly impact CRLF by rapidly dewatering reaches of the Carmel River, as the combined well production during late

¹⁸ See Map 14 California Red-Legged Frog April 2006 Final Critical Habitat Unit MNT-2 and 19244 Federal Register / Vol. 71, No. 71 / Thursday, April 13, 2006 / Rules and Regulations.

spring through summer is often 2 to 4 times the stream flow. The majority of wells capable of dewatering reaches of the Carmel River during the low flow season are California American Water production wells producing ~11,200 AFY, but Carmel Valley has approximately 561 private wells, including wells in the alluvial aquifer and upland areas, that produce another ~2,500 AFY, and the cumulative impact of these wells significantly reduces the amount of water available for CRLF.

South-Central California Steelhead

Steelhead (*Oncorhynchus mykiss*) inhabits two coastal streams in the Region, San Jose Creek and the Carmel River. Very little is known or published on the population in San Jose Creek, but the population in the Carmel River Basin is well studied. The Basin supports one of the stronger steelhead populations in the South-Central Coast distinctive population segment, extending from the Pajaro River in Santa Cruz County south to streams north of the Santa Maria River in Ventura County. While the population is relatively strong compared to other streams, the numbers of adult fish returning to the basin have declined by about 50%-75% since the mid-1970s. This decline is opined to have been related to several factors, but paramount was the effect of dam construction, reservoir operations, out-of-basin exports, and extensive well pumping from the alluvial portions of Carmel Valley (Carmel River Watershed Assessment, MPWMD, 2004). In particular, the increase in water pumping associated with expansion of California American Water well fields after 1964, and other private wells in the lower Carmel Valley affected the success of fish migration and several life phases of steelhead.

To complete their life cycle, steelhead depend on perennial stream flow. Until approximately the early 1980's, Carmel River mainstem reservoir operations frequently interrupted flows at key points in the cycle, and increased groundwater production after 1964 directly jeopardized key phases including upstream and downstream migration of adults, incubation of larvae, emergence of fry, rearing of juveniles, and the downstream migration of smolts. In relation to the development of a Plan and meeting the Statewide priority of restoring steelhead populations, key objectives of the Plan should be to implement strategies/projects that reverse the historical pattern of out-of-basin exports during periods of low flow from the Carmel Basin, reduce impacts from groundwater extraction throughout the Region, and reduce the dependence on surface storage in Los Padres Reservoir to maintain summer habitat in the Carmel River.

3.5.2 Ventana Wilderness Area

This rugged portion of the beautiful Santa Lucia Range was established as an official Primitive area in 1931 and Congress designated it a formal wilderness area in 1969. Its topography is characterized by steep-sided canyons and sharp-crested ridges with remarkably remote streams and valleys, despite its proximity to major human population centers. Within the Region, elevations in the Ventana Wilderness range from ~1,000 feet in the vicinity of Los Padres Dam to nearly 5,000 feet at South Ventana Cone along Chews Ridge at the upper boundary of the Carmel River Basin. Streams in the Wilderness Area fall rapidly through narrow canyons, over bedrock, exposed boulders, and several waterfalls spill into deep pools. Many springs flow from cracks in the underlying granitic rock. The vegetation is dominated by chaparral series, but grassy meadows, ponderosa pine forests, several unique stands of Santa Lucia fir and virgin coastal redwood trees are located in the area. Importantly, future water development is tightly restricted, and human intervention in natural processes is discouraged. The area functions as a major source of water for the Region.

3.5.3 Areas of Special Biological Significance

In the mid-1970's, 34 areas on the coast of California were designated as areas requiring protection by the State Water Resources Control Board and were called Areas of Special Biological Significance (ASBS) and include the following.

Pacific Grove

Critical Coastal Area (CCA) No. 42a flows into the Pacific Grove ASBS and forms a State Water Quality Protection Area (SWQPA) 3.3 miles in length along the Pacific Grove shoreline. The southern portion of the Monterey Bay coastline, including Pacific Grove, is listed as impaired for metals, based on historical mussel water data¹⁹. However, the Coastal Commission has set a low priority for determining a total maximum daily load.

Carmel Bay

The Carmel Bay SWQPA is roughly 5.0 miles in length encompassing the area of Carmel Bay between Pescadero Point and Granite Point. The Carmel River and San Jose Creek watersheds, which include storm water from the City of Carmel-by-the-Sea and the Pebble Beach area, drain into the Carmel Bay ASBS.

Point Lobos Ecological Reserve

The California State Parks Department described this area as "...one of the richest marine habitats in California" and quotes landscape artist Francis McComas as saying this area is "...the greatest meeting of land and water in the world." The ecological reserve area is the first underwater reserve in the nation and comprises approximately 775 acres of tide and submerged land lying at the south end of Carmel Bay. The underwater reserve is adjacent to the Point Lobos State Reserve, which includes about 554 acres of coastal lands immediately south and west of Carmel River State Beach.

3.6 Social and Cultural Makeup and Values of the Community

The current estimated population of the Region is about 115,000 or about 30% of the total population of Monterey County. The population within the MPWMD boundary is approximately 112,000. In the next 20 years, population in the six cities in the Region is projected to decline slightly (AMBAG, 2004). The unincorporated portion of the Region has essentially four distinct population segments. These are located along the Highway 68 corridor, in the Pebble Beach/Carmel Highlands area, the valley portion of the Carmel River watershed between the mouth of the river and Carmel Valley Village, and in the Cachagua area, also in the Carmel River watershed. With the exception of the Cachagua area, these population segments are within the MPWMD boundary.

According to the Monterey County General Plan Update completed in 2004, estimates for the Cachagua area indicate that the current population totals 1,906 and development constraints may limit future population growth in this area to about 4,000 residents. According to the Comprehensive Fiscal Analysis of the Proposed Incorporation of Carmel Valley (June 9, 2006), approximately 11,700 people reside in the valley portion of the Carmel River watershed. Population growth in this area over the next 20 years is difficult to estimate. However, population growth in this area may be similar to incorporated portions of the Region (i.e. declining slightly), as development constraints are similar between the two areas.

As in many areas in California, community attitudes concerning growth are divided. Owners of undeveloped property, business representatives, and construction tradespersons are generally in favor of growth, while homeowners and environmentalists are often opposed. Within the California American Water service area²⁰ (i.e., most of the planning Region), the public – as reflected in the positions of local

¹⁹ California Coastal Commission, California's Critical Coastal Areas, State of the CCAs Report, June 2, 2006, CCA #42a

²⁰ Within the planning Region, the Monterey District of California American Water includes the cities of Monterey, Carmel-by-the-Sea, Del Rey Oaks, Pacific Grove, Sand City, most of Seaside, and the unincorporated communities of Carmel Valley, Del Monte Forest (Pebble Beach), Carmel Highlands, Robles Del Rio (in Carmel Valley), Rancho Fiesta (in Carmel Valley), Ryan Ranch (Hwy 68 corridor), Bishop Ranch (Hwy 68 corridor), and Hidden Hills/Bay Ridge (Hwy 68 corridor).

elected officials and voting on ballot measures – appears to support construction or development of existing legal lots of record, but often expresses concern regarding new property subdivisions. Within the planning area, the community is supportive of efforts to protect and enhance scenic values and natural resources. Large portions of the planning area are dedicated to recreation and conservation through federal, state, regional, and local parks, and through protected privately-owned properties, such as those owned by the Big Sur Land Trust and The Nature Conservancy.

Approximately 38 miles of coastline offer scenic value and access to coastal resources. The Carmel River and many streams, creeks, lagoons, and other water bodies are also available to the public. The entire coastline of the planning area is located within the Monterey Bay National Marine Sanctuary. Several public and non-profit institutions have programs and resources related to marine science, such as Monterey Peninsula College, the local community college, Monterey Bay Aquarium, Friends of the Sea Otter, Stanford University’s Hopkins Marine Laboratory, and the National Weather Service. The community actively participates in protecting and enhancing local natural resources through volunteer work projects, informational forums, and cash donations in support of these activities.

3.7 Economic Conditions and Important Trends

The Region contains some of the most expensive housing in the County in areas along the coast in the Carmel Highlands, Pebble Beach, Pacific Grove, Monterey and further inland in Carmel Valley and Hidden Hills. The 2003 Monterey County Civil Grand Jury Report described water supply constraints as one of the factors in contributing to an acute shortage of affordable housing County-wide and described the Monterey Peninsula area as even less affordable than the rest of the County. The 2004 Monterey County Civil Grand Jury Report followed up on the affordable housing issue with a recommendation to improve and expand water resources to allow for growth.

The economic base in the Region is made up of tourism, government, education, and the military. According to “Tools for Assessing Jobs-Housing Balance and Commute Patterns in the Monterey Bay Region, Final Report,” May 9, 2001, prepared by the Association of Monterey Bay Area Governments (AMBAG), over the next 20 years, population and housing in Monterey County is projected to increase by more than 30%. Monterey County is projected to see a slightly higher percentage increase in population and housing than in jobs. However, growth in both the unincorporated areas and cities may be constrained by limited water supplies and levels of service on local roads in the Region and surrounding area²¹.

Median household incomes from the 2000 census are summarized in **Table 3-5**.

²¹ Monterey County 21st Century Program/General Plan Update at: <http://www.co.monterey.ca.us/gpu/information/index.html>. Excerpted from the Monterey County Existing Conditions Report created in September, 1999.

Draft 2005 Monterey County Regional Transportation Plan Appendix C: Level of Service Analysis of Regional Network Results, Association of Monterey Bay Area Governments, June 20, 2003.

Draft Environmental Impact Report, 2005 Monterey Bay Area Metropolitan, Transportation Plan, Association of Monterey Bay Area Governments, 2005 Monterey County, Regional Transportation Plan, Transportation Agency for Monterey County, 2005 Santa Cruz County, Regional Transportation Plan, Santa Cruz County Regional Transportation Commission, State Clearinghouse #2004061013, Prepared by Lamphier-Gregory, 1944 Embarcadero, Oakland, CA 94606. February 15, 2005

Table 3-5: Median Household Income (MHI) by Area ^a

Location	Number of Households	Total Population	MHI
California	1,2081,769	35,278,768	\$47,493
City of Carmel-by-the-Sea	2,285	4081	\$58,163
Carmel (greater area)	NA	NA	\$90,000+
Carmel Valley Village	1963	4700	\$70,000+
City of Del Rey Oaks	704	1650	\$59,423
City of Monterey	12600	29674	\$49,109
City of Pacific Grove	7316	15522	\$50,254
City of Sand City	80	261	\$34,375
City of Seaside	9833	31696	\$41,393
Pebble Beach	NA	NA	\$130,000+

^a From 2000 U.S. Census Bureau

3.8 Disadvantaged Communities

State IRWM guidelines require that water resources planning identify any disadvantaged communities in the region, the specific critical water-related needs of such communities, and what mechanisms were used in development of the Plan to ensure participation of disadvantaged communities. A “disadvantaged community” is defined by the State of California as a community with an annual median household income (MHI) that is less than 80% of the statewide MHI [CA Water Code, Section 79505.5(a)]. The 2000 US Census indicated that the MHI for California was \$47,493 in 1999; therefore, communities with an average MHI of \$37,994 or less are considered disadvantaged communities. In addition, the Plan must identify any water-related Environmental Justice concerns for the region and describe how implementation of the Plan addresses Environmental Justice.

When data are analyzed on a census tract by census tract basis, there are four tracts within the region that can be considered disadvantaged. These tracts represent approximately 17% of the population in the Region and are shown in **Table 3-6**.

Table 3-6: Disadvantaged Census Tracts^a

Census Tract	Number of Households	Total Population	Median Household Income
127.00	1,818	3,538	\$36,705
137.00	1,380	5,331	\$34,417
140.00	834	2,556	\$34,653
141.01	1,114	8,322	\$34,430

^a From 2000 U.S. Census Bureau

The population of these areas is represented on the TAC and in the Stakeholder Group. In roundtable discussions during meetings of the TAC, no additional critical water-resource related issues were identified that related directly to disadvantage communities or environmental justice concerns.

Chapter 4 Objectives

IRWM Standard C

This section identifies IRWM Plan objectives and the manner in which they were determined.

4.1 Monterey Peninsula Regional Goals

Development of goals and objectives was a key step in the integrated regional water management planning process. Goals are established for broadly outlining the IRWMP direction, whereas objectives provide a reasonable basis for decision making, guide work efforts, and may be used to evaluate project benefits. The goals for this Plan were based on improving existing water resource conditions in the Region at the time the IRWM Plan was developed. These represent achievable goals, but may not represent the highest function attainable for any particular goal due to present-day legal, financial, and physical constraints. However, an important function of the IRWM Plan is to outline a process for adaptive management, including a process to change goals based on new information and/or conditions. An adaptive management process for modifying goals and objectives is described in Section 7.3.

In 2005, MPWMD coordinated several stakeholder meetings to solicit input on goals and objectives. Stakeholders appointed a Technical Advisory Committee (TAC) comprised of staff representatives from the Water Management Group (WMG) and other stakeholders within the Region including CSUMB, CRWC, MBNMS, Seaside, CRSA, the Planning and Conservation League, and Pebble Beach Co. The TAC refined a set of goals and objectives that the stakeholder group will consider prior to adoption of a final Plan.

After DWR funded a planning grant for the Region in 2006 and based in part on the DWR/SWRCB review of Regional goals and objectives, stakeholders were asked to re-evaluate goals and objectives. The result was a set of regional goals based on statewide priorities, previous water management efforts, stakeholder involvement, and experience in regional issues. Between December 2006 and July 2007, MPWMD coordinated a series of workshops to finalize the goals and objectives that are included in this IRWMP. A diagram delineating the decision process by the Monterey Peninsula Region is provided in **Figure 4-1: Goals and Objectives Process**.

The goals included herein best illustrate the shared regional vision for accomplishing integrated regional water resource plans and other future planning efforts in the area. Regional goals are organized into five general categories: water supply, water quality, flood protection and erosion prevention, environmental protection and enhancement, and regional communication and cooperation. The goals for each of these five categories are summarized in **Table 4-1**.

Figure 4-1: Goals and Objectives Process

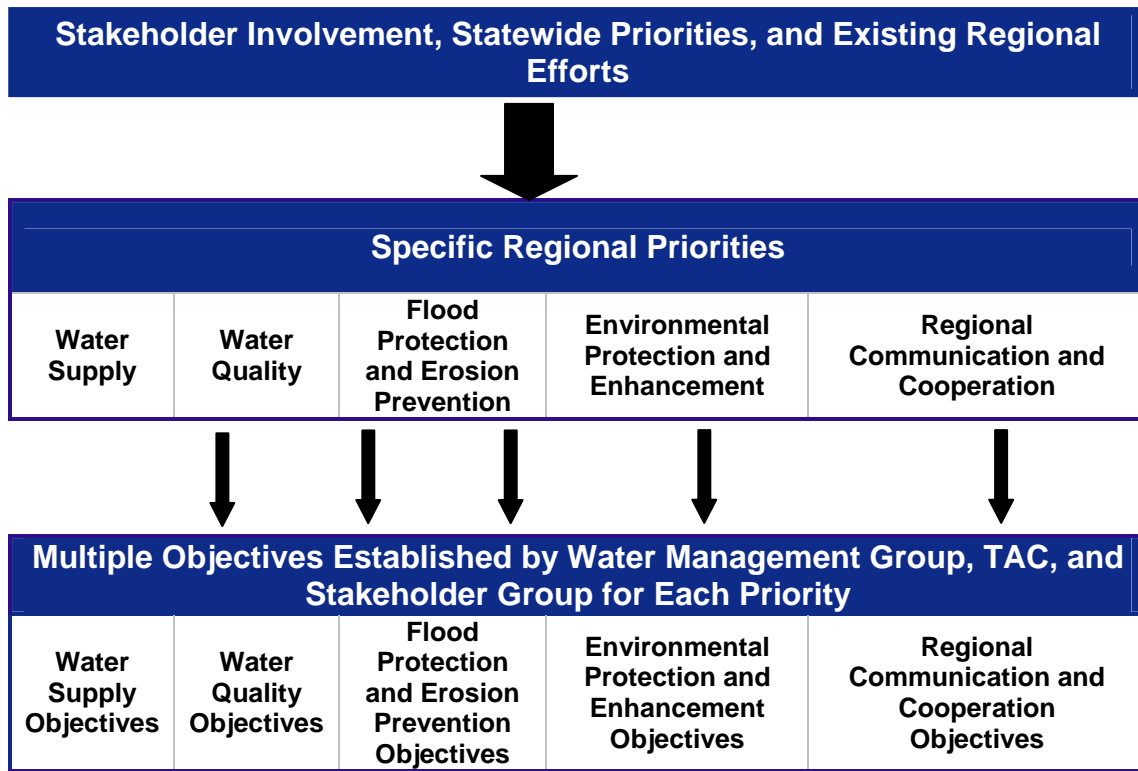


Table 4-1: Monterey Peninsula Regional Goals

Regional Communication and Cooperation	
Identify an appropriate forum for regional communication, cooperation, and education. Develop protocols for reducing inconsistencies in water management strategies between local, regional, State, and Federal entities.	
Water Supply	Water Quality
Improve regional water supply reliability through environmentally responsible solutions, promote water conservation, and protect the community from drought with a focus on interagency cooperation and conjunctive use of regional water resources.	Protect and improve water quality for beneficial uses consistent with regional community interests and the RWQCB basin plan through planning and implementation in cooperation with local and state agencies and regional stakeholders.
Flood Protection and Erosion Prevention	Environmental Protection and Enhancement
Ensure that flood protection and erosion prevention strategies are developed and implemented through a collaborative and watershed-wide approach and are designed to maximize opportunities for comprehensive management of water resources.	Preserve the environmental wealth and well-being of the Region's watersheds by taking advantage of opportunities to assess, restore and enhance natural resources of streams and watershed areas when developing water supply, water quality, and flood protection strategies.

4.2 Plan Objectives

The plan objectives were developed based on the goals for the region. Several objectives were developed in order to address the major water related issues and conflicts within the region. The objectives are more specific than regional goals and they will be accomplished through the water management strategies discussed in Chapter 5, Water Management Strategies.

4.2.1 Development of Objectives

The first step in the objective development process was to list specific objectives. This effort built upon ongoing planning efforts in the region, including the Carmel River Watershed Action Plan prioritization process, the development of the Monterey Regional Storm Water Management Program, and the Carmel River Parkway Plan. The relation of the IRWM planning process with these planning efforts is discussed in Chapter 13.

Like the regional goals, the plan objectives were organized under the five categories of water supply, water quality, flood protection and erosion prevention, environmental protection and enhancement, and regional communication and cooperation. These objectives are specific to the Monterey Peninsula region, and are defined as the means by which the planning goals can be met. The result of this effort is shown in **Table 4-2** and **Table 4-3**.

Table 4-2: Water Supply and Water Quality Objectives

Water Supply	Water Quality
<ul style="list-style-type: none"> • Meet water supply replacement targets set by MPWMD that satisfy existing water demand and meet the following current requirements: State Water Resources Control Board Order No. WR 95-10 (and subsequent orders); Seaside Groundwater Basin Final Decision (Case No. M66343). This is currently estimated to be approximately 12,500 acre-feet. Once existing demand is met (e.g., through implementation of water supply projects), meet water supply targets set by MPWMD to meet estimated long term future demand (based on General Plan Build-Out estimates). This is currently estimated to be approximately 4,550 acre-feet. The total need for water supply projects is estimated to be about 95% of existing demand. • Maintain the quantity and quality of water in the Seaside Groundwater Basin as specified in the Final Decision setting forth the adjudicated rights in the Groundwater Basin. • Minimize the impacts to sensitive species and habitats from diversions (surface and groundwater) by optimizing the use of groundwater storage and conjunctive use options. • Maximize use of recycled water. • Optimize conjunctive use of surface and groundwater. • Evaluate, advance, and create water conservation efforts throughout the Region. • Minimize fiscal impacts to ratepayers and taxpayers. 	<ul style="list-style-type: none"> • Meet or exceed applicable water quality standards established by regulatory processes or by stakeholders (whichever is higher). • Improve water quality for environmental resource (e.g. steelhead). Protect surface waters and groundwater basins from contamination and threat of contamination. • Meet or exceed recycled water quality targets established by stakeholders. • Minimize impacts from storm water (or urban) runoff through implementation of Best Management Practices or other alternatives. • Improve stream and near-shore water quality. • Define the maximum extent practicable for reducing discharges to Areas of Special Biological Significance (ASBS). Reduce or eliminate to the maximum extent practicable the storm and non-storm water flows to the ASBS.

Table 4-3: Flood and Erosion Protection, Environmental Protection and Enhancement, and Regional Communication Objectives

Flood Protection and Erosion Prevention	Environmental Protection and Enhancement	Regional Communication
<ul style="list-style-type: none"> • Develop regional projects and plans that are necessary to protect existing infrastructure and sensitive habitats from flood damage. • Develop approaches for adaptive management that minimize maintenance and repair requirements. • Protect quality and availability of water while preserving or restoring ecologic and stream functions, and enhance aquatic and riparian resources when appropriate. • Provide community benefits beyond flood protection, such as public access, open space, recreation, agricultural preservation, and economic development. 	<ul style="list-style-type: none"> • Identify opportunities to assess, protect, enhance, and/or restore natural resources when developing water management strategies and projects. • Protect and enhance sensitive species and their habitats in the regional watersheds. • Minimize adverse effects on biological and cultural resources, including riparian habitats, habitats supporting sensitive plant or animal species, and archaeological sites when implementing strategies and projects. • Identify opportunities for open spaces, trails and parks along streams and other recreational areas in the watershed that can be incorporated into water supply, water quality, or flood protection projects. • Identify and integrate elements from appropriate Federal and State species protection and recovery plans and from other similar plans (e.g., SWRCB Critical Coastal Areas Program) that are applicable to the region. 	<ul style="list-style-type: none"> • Meet or exceed State and Federal regulatory orders, provided that mandates are funded. • Identify strategies for protecting both infrastructure and environmental resources. • Foster collaboration between regional entities to minimize and resolve potential conflicts and to obtain support for environmentally responsible water supply solutions. • Build relationships with State and Federal regulatory agencies and other water forums and agencies to facilitate the permitting, planning and implementation of water-related projects. • Identify opportunities for public education about the need, complexity, and cost of strategies, programs, plans, and projects to improve water supply, water quality, flood management, coastal conservation, and environmental protection.

4.2.2 Matching Goals with Objectives

Table 4-4 shows how every goal has multiple objectives associated with it, and inversely every objective accomplishes at least one goal. While most objectives can be categorized under a single goal, a strategic part of integrated planning is recognizing how some objectives can help meet multiple goals. This concept is also illustrated in **Figure 4-1**. Each checkmark represents the association between a goal and objective.

Short-term and long-term measurable objectives were set for regional priorities to aid in prioritizing projects and in monitoring plan performance. See Chapter 6 for a detailed description.

Table 4-4: Matching Goals and Objectives

Regional Objectives Regional Goals		Water Supply						Water Quality				
		Meet water supply targets	Support the Seaside Groundwater Basin Watermaster to implement the physical solution to restore the safe yield in the groundwater basin.	Minimize the impacts to sensitive species and habitats from diversions .	Maximize use of recycled water	Evaluate, existing conservation efforts throughout the Region.	Minimize fiscal impacts to ratepayers and taxpayers	Meet or exceed applicable water quality standards established by regulatory processes or by stakeholders	Improve water quality for environmental resource use.	Meet or exceed recycled water quality targets established by stakeholders	Minimize impacts from storm water (or urban) runoff through implementation of Best Management Practices or other alternatives	Improve stream and near-shore water quality to at least a level that prevents periodic closures to recreational use
Water Supply	Improve regional water supply reliability; promote water conservation; provide drought protection through cooperation and conjunctive use.	✓	✓	✓	✓	✓	✓					
Water Quality	Protect and improve water quality for beneficial uses consistent with regional interests and in cooperation with local, State and Federal agencies.		✓					✓	✓	✓	✓	✓
Flood Protection and Erosion Prevention	Develop and implement flood protection strategies with a collaborative and watershed-wide approach. Maximize opportunities for comprehensive management of water resources.											
Environmental Protection and Enhancement	Restore and enhance natural resources when developing water supply, water quality, and flood protection strategies.											
Regional Communication and cooperation	Identify an appropriate forum for regional communication, cooperation, and education. Develop protocols for reducing inconsistencies in water management strategies between local, regional, State, and Federal entities.											

Table 4-4: Matching Goals and Objectives

Regional Objectives		Flood Protection and Erosion Prevention				Environmental Protection and Enhancement					Regional Communication and Cooperation				
Regional Goals		Develop regional projects and plans to protect existing infrastructure and sensitive habitats from flood damage and erosion	Develop approaches for adaptive management that minimize maintenance and repair requirements.,	Protect quality and availability of water while preserving ecologic and stream functions, and enhance aquatic and riparian resources when appropriate.	Provide community benefits beyond flood protection, such as public access, open space, recreation, agricultural preservation, and economic development	Identify opportunities to assess, protect, enhance, and/or restore natural resources when developing water management strategies and projects	Protect and enhance sensitive species and their habitats in the regional watersheds	Minimize adverse effects on biological and cultural resources when implementing strategies and projects	Identify opportunities for open spaces, trails and parks along streams and other recreational areas in the watershed that can be incorporated into water supply, water quality, flood protection, or environmental restoration projects	Identify and integrate elements from appropriate Federal and State species protection and recovery plans and from other similar plans that are applicable to the region	Meet or exceed State and Federal regulatory orders, provided that mandates are funded	Identify strategies for protecting both infrastructure and environmental resources	Foster collaboration between regional entities to minimize and resolve potential conflicts and to obtain support for environmentally responsible water supply solutions	Build relationships with State and Federal regulatory agencies and other water forums and agencies to facilitate the permitting, planning and implementation of water-related projects	Identify opportunities for public education about the need, complexity, and cost of strategies, programs, plans, and projects to improve water supply, water quality, flood management, coastal conservation, and environmental protection
Water Supply	Improve regional water supply reliability; promote water conservation; provide drought protection through cooperation and conjunctive use.			✓									✓		
Water Quality	Protect and improve water quality for beneficial uses consistent with regional interests and in cooperation with local, State and Federal agencies.		✓	✓									✓		
Flood Protection and Erosion Prevention	Develop and implement flood protection strategies with a collaborative and watershed-wide approach. Maximize opportunities for comprehensive management of water resources.	✓	✓	✓	✓								✓		
Environmental Protection and Enhancement	Restore and enhance natural resources when developing water supply, water quality, and flood protection strategies.	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓		
Regional Communication and cooperation	Identify an appropriate forum for regional communication, cooperation, and education. Develop protocols for reducing inconsistencies in water management strategies between local, regional, State, and Federal entities.										✓	✓	✓	✓	✓

4.3 Description of Objectives

This section summarizes each objective.

4.3.1 Water Supply Objectives

Meet or exceed targets set by MPWMD Board of Directors for replacement supply

In 1995, SWRCB issued Order No. WR 95-10 to California American Water stating that the company lacked rights to all but 3,376 AFY of water being diverted from the Carmel Valley Aquifer to its customers on the Monterey Peninsula. The order confirmed the nature of these rights and called for an immediate 15% reduction in diversions from the Carmel River and underlying aquifer for 1996 and a 20% reduction in subsequent years to a maximum diversion amount of 11,285 AFY. The base for these reductions was set at 14,106 acre-feet per year, which was the average of annual diversions between 1979 and 1988. The State opined that CAW should diligently develop and implement a plan for obtaining water consistent with California law and required that any new supplies of water must offset Carmel River pumping on a one-for-one basis. Thus, a new water supply must be found for 10,730 AFY before any additional water is allocated. Subsequent orders have modified the original order and it is in the interest of the Region's stakeholders to work with Cal-Am to ensure these orders are met.

Water supply replacement targets set by MPWMD satisfy existing water demand and meet the following current requirements: SWRCB Order No. WR 95-10 (and subsequent orders); and the Seaside Groundwater Basin Final Decision (Case No. M66343). This replacement supply is currently estimated to be approximately 12,500 acre-feet.

Once existing demand is met (e.g., through implementation of water supply projects), the water supply target set by MPWMD is to meet estimated long term future demand (based on General Plan Build-Out estimates). This is currently estimated to be approximately 4,550 acre-feet.

Support the Seaside Groundwater Basin Watermaster to implement the physical solution to restore the safe yield in the groundwater basin

Beginning in 1995 with the implementation of SWRCB Order No. 95-10, groundwater extraction near the coast was increased, which resulted in declining water levels and depletion of groundwater storage. A hydrogeologic investigation in April 2005 revealed that the groundwater basin is in a state of overdraft and that groundwater extraction exceeds the sustainable yield. The main limitation on yield in the basin is the risk of seawater intrusion and an issue of concern is that seawater might reach production wells if the basin operation does not change.

The Final Statement of Decision in the 2006 water rights adjudication of the Seaside Groundwater Basin has made regional coordination vital to both sustainable and legal management of this basin. The Court's decision created a Watermaster that includes CAW, MCWRA, MPWMD, Del Rey Oaks, Monterey, Seaside, and representation for landowners to oversee management of the Seaside Groundwater Basin. These entities were directed by the Court to complete a groundwater management and monitoring plan. The Court-ordered physical solution, which is to be implemented over a 15-year period beginning in 2006, would eliminate the overdraft to prevent seawater intrusion (see section 3.4.2 for more details).

The changes required by the Court are likely to have a significant impact on water supply throughout the Region and could affect CAW's pumping operations in the Carmel River watershed. In addition to any future rulings that will maintain the quantity and quality of water in the SGB, an objective in this Plan, is to facilitate the implementation of the Final Decision and to assist with the execution of the groundwater monitoring and management plan.

Minimize the impacts to sensitive species and habitats from diversions of surface water by optimizing the use of groundwater storage and conjunctive use options.

The cumulative effect of human influences on surface water, especially in the Carmel River watershed, has resulted in fragmented environments that require intensive management efforts. Future projects should include contingencies to mitigate possible impacts on sensitive species and habitats.

Maximize use of recycled water.

The Monterey Regional Water Pollution Control Agency (MRWPCA) has carried out several recycled water projects to date. The largest of these, the Monterey County Water Recycling Project, was completed and put into service in 1998. However, to date, none of these projects have imported recycled water back into the Region. Other projects proposed by MRWPCA that would benefit the Region are currently in various stages of planning, and should be ready to move forward into design and construction in the near future. An urban water recycling project in conjunction with Marina Coast Water District (MCWD) is currently in design.

The Carmel Area Wastewater District completed a water recycling project with financing from the Pebble Beach Company in 1993 and subsequently added tertiary treatment to improve the quality of recycled water. The plant produces about 700 AFA of water for use on turf irrigation. Recently CAWD and CAW signed an agreement to complete improvements that allows excess treated water to be discharged to the Carmel River Lagoon.

The construction of new reclamation facilities and optimizing the use of existing ones will reduce overall water demand from fresh water sources.

Optimize conjunctive use of surface and groundwater.

All municipal water sources in the Monterey Peninsula region are inextricably linked. Careful, conjunctive use of Carmel River resources and Seaside Basin resources through implementation of Aquifer Storage and Recovery projects and recycled water projects could minimize undesirable physical, environmental, and economical effects while optimizing the water supply balance in both basins.

In addition, continuing the practice of using reservoir releases to augment dry season Carmel River flows and concentrating groundwater production at the farthest downstream wells helps improve riparian and aquatic habitats in the lower Carmel River.

Evaluate existing conservation efforts throughout the Region.

Through its conservation program, MPWMD has enacted and enforces several ordinances designed to conserve water on an ongoing basis as well as during drought conditions. MPWMD seeks to continue these efforts within its boundary and, to the extent feasible, assist with conservation programs elsewhere in the Region. This objective may be coordinated with efforts by the six Cities to inspect irrigation systems in open space areas and look for methods to reduce runoff from these areas.

Where there are no current plans or efforts ongoing, implement water conservation plans.

Minimize fiscal impacts to ratepayers and taxpayers.

Since SWRCB Order No. 95-10 was issued to Cal-Am, the company has been at risk of paying fines if production were to exceed 11,285 AFY in Carmel River diversions. This occurred in water year 1997 and resulted in the SWRCB levying a fine against Cal-Am of \$168,000, which was not passed on to ratepayers in the form of a rate hike. Subsequently, Cal-Am announced that it may seek reimbursement from ratepayers for any future fines. In addition to the cost of delivering water, ratepayers and taxpayers within the MPWMD boundary fund mitigation activities, studies for future water supply projects, and construction of water supply projects to reduce impacts from pumping in Carmel Valley. Although this objective is not used in scoring projects or in measuring Plan performance, Regional projects and water

management strategies should consider the potential for rate increases and whether projects would assist in avoiding potential fines.

4.3.2 Water Quality Objectives

Meet or exceed all applicable water quality regulatory standards.

Programs need to be in place to ensure that water quality regulations are either met or exceeded. This includes activities that can mitigate current problems and evade possible future water quality degradation, e.g. seawater intrusion.

Meet or exceed urban water quality targets established by stakeholders.

Targets set by municipal and industrial stakeholders that are beyond regulatory requirements should be met or exceeded.

Improve Carmel River water quality for environmental resources and recreational use.

Improving and protecting water quality in the Carmel River is particularly important to ensure its value as a recreational resource and as a host to a number of sensitive species including steelhead trout and red-legged-frogs.

Meet or exceed recycled water quality targets established by stakeholders.

In order to promote public and private recycled water demand, it is important that water quality targets set by stakeholders not only meet regulatory requirements but also meet the requirements or expectations of the eventual end-users.

Aid in meeting Total Maximum Daily Loads established, or to be established, for the Carmel River watershed.

Total maximum daily loads (TMDLs) have not yet been developed for any of the Region's streams, including the Carmel River. The Central Coast Regional Water Quality Control Board (RWQCB), Region 3 Basin Plan identified the Carmel River Lagoon as the only water body in the Region that requires an intensive survey. A "water quality screening" is recommended, but the Basin Plan did not identify a particular problem with the water quality in this body.

Protect surface waters from contamination

All surface waters in the planning region should be protected from contamination and the threat of contamination. Protecting surface waters that drain to Carmel Bay and Monterey Bay will protect the Monterey Bay National Marine Sanctuary. The Monterey Regional Storm Water Management Program is currently being implemented to assist in meeting this objective.

Protect groundwater basins from contamination and threat of contamination.

All groundwater basins should be protected from contamination and the threat of contamination. This includes protecting all groundwater basins from point-source and non-point-source pollutants and preventing sea-water intrusion into the Seaside Groundwater Basin.

Minimize impacts from storm water (or urban) runoff through implementation of Best Management Practices or other alternatives.

The discharge of pollutants to waters of the United States from any point source is unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. The planning Region is subject to "Phase II" NPDES requirements which are intended to address potentially adverse impacts to water quality and aquatic habitat by instituting the use of controls on the unregulated sources of storm water discharges that have the greatest likelihood of causing continued environmental degradation. Although these problems provide the basis and rationale for the Phase II

Program, it is important to note that these problems do not necessarily exist or pertain to the storm drains in the planning Region.

In 2000, the Cities in the Southern Monterey Bay area, Monterey County, and the Pebble Beach Company formed a Working Group to develop a storm water management program and secure a Phase II NPDES permit from the Regional Water Quality Control Board (RWQCB) Region 3. The Working Group developed the Monterey Regional Storm Water Management Program (MRSWMP) and permit coverage was issued by RWQCB 3 in September 2006. The MRSWMP is currently being implemented by the participating entities.

The MRSWMP contains a series of management practices, referred to as “Best Management Practices” (BMPs). These BMPs are designed to reduce the discharge of pollutants from the municipal separate storm sewer systems to the “maximum extent practicable,” to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act. The achievement of these objectives will be gauged using a series of measurable goals, which also are contained in the MRSWMP.

Improve stream and near-shore water quality to at least a level that prevents periodic closures to recreational use.

Regional streams and near shore ocean environments are vital public trust resources that should be protected. The health of these resources is based on a wide range of factors, thus collaboration on a regional scale is necessary to effectively maintain or improve these resources.

4.3.3 Flood Protection and Erosion Prevention Objectives

Develop regional plans and projects to protect existing infrastructure and sensitive habitats from flood damage and erosion.

Flood-prone areas within the Region, such as within the Carmel River floodplain and adjacent to the Carmel River lagoon, should be protected from flooding during the 100-year flood. However, it should also be recognized that some areas within the Region were developed prior to modern regulations concerning flood protection and that a design standard incorporating 100-year flood protection may not be feasible in all instances.

Approximately 1,700 properties are located in the 100-year floodplain of the Carmel River. This is the most flood-prone area within the Region and has the highest number of repeat losses (94)²² in Monterey County. The March 10, 1995 flood, which had an estimated peak magnitude of 16,000 cubic feet per second or about a 40-year return flood level, damaged 700 residences and 68 businesses and caused the evacuation of most people in the floodplain. In addition, two 80-foot spans of the Highway 1 Bridge were washed away, which required the construction of a new bridge across the river.

Develop approaches for adaptive management that minimize maintenance and repair requirements, protect quality and availability of water, and enhance aquatic and riparian resources.

An adaptive management procedure is a dynamic planning tool that will ensure the long-term success of implemented projects and programs. Development and implementation of such a management program will ensure the Region flexibility needed to achieve its goals and objectives.

An example of this adaptive management approach is the plan to manage the Carmel River Lagoon, which is immediately adjacent to and affects Critical Coastal Watershed Area No. 44 (Carmel Bay). Under natural conditions, the barrier beach at the mouth of the Carmel River builds up from wind and wave action and a lagoon forms behind the beach. Low-lying structures near the Lagoon are subject to flooding and damage from both the Carmel River and ocean waves filling the Lagoon when the barrier

²² Defined as two or more flood insurance claims of \$1,000 or more in a 10-year period.

beach at the mouth of the Lagoon prevents outflow. Since the listing of the California red-legged frog in 1996 and steelhead in 1997 as a threatened species, management actions to respond to the threat of flood and erosion in the vicinity of the Lagoon have come under increasing criticism by State and Federal resource managers as these efforts affects several stages of the steelhead life cycle and reduce the habitat value for all aquatic species in the Lagoon.

Currently, management is carried out by several agencies including the Monterey County Public Works Department under the direction of MCWRA, State Parks, CAWD, MPWMD, and private groups. Normally, this is done in consultation with a technical advisory committee (TAC) comprised of officials from the Corps, NOAA Fisheries, US Fish and Wildlife, CDFG, the California Coastal Commission, State Parks, MCWRA, and MPWMD. State Parks and MCWRA propose to change this ad hoc approach and implement an adaptive management plan in the future that will seek to minimize environmental impacts in the short term. The Lagoon TAC has also proposed an outline to develop a long term plan that will include adaptive management.

Protect quality and availability of water while preserving or restoring ecologic and stream function

During periods of high flows, suspended sediment, sand, debris, and other materials present in surface waters can temporarily affect water quality and affect aquatic species. Flood protection projects that reduce or temporarily detain these constituents can improve water quality. In addition, detention and/or retention of stormwater can increase groundwater recharge in local aquifers.

Provide community benefits beyond flood protection, such as public access, open space, recreation, agricultural preservation, and economic development.

Flood protection projects provide an opportunity to incorporate multiple water management strategies. Projects should take advantage of these opportunities whenever feasible. Monterey County has a Class 5 rating in the National Flood Insurance Program (NFIP) Community Rating System (CRS) at this time. The CRS was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. Under the CRS, flood insurance premiums are adjusted to reflect the reduced flood risk resulting from community activities. The classification system ranges from Class 10 to Class 1. At the entry level, Class 10, communities receive no discount on flood insurance premiums; however, a 5% discount is provided for each class reduction. Monterey County was upgraded to a Class 6 community on October 1, 2002. In 2006, Monterey County completed a five year cycle application with the Insurance Services Office and in May 2007, the County was officially upgraded to a Class 5 community. As a Class 5 community, residents located in the 100-year floodplain receive a 25% discount on their flood insurance premiums. Structures located in Zones B or C (outside the 100-year floodplain) receive a 10% discount on their flood insurance premiums.

4.3.4 Environmental Protection and Enhancement

Identify opportunities to assess, protect, enhance, and/or restore natural resources when developing water management strategies and projects.

The Region has several natural resources that are sensitive to human impacts. Project planning should be carried out in such a way that opportunities to protect, enhance, and restore natural resources are identified and incorporated into the project.

Protect and enhance sensitive species and their habitats in the Carmel River watershed.

Regional planning should consider the Carmel River watershed as a unique habitat for sensitive species when developing water management strategies. The Watershed Action Plan for Carmel River Watershed Assessment included a list of recommended projects and measures for helping to restore ecosystem function in the Carmel River Basin (CRWC, 2004). This list, as well as management strategies for other

areas in the Region will be used to develop a plan to conserve, restore and enhance sensitive species and Special-Status species within the Region.

Minimize adverse effects on biological and cultural resources, including riparian habitats, habitats supporting sensitive plant or animal species, and archaeological sites when implementing strategies and projects.

It is of key importance to minimize the environmental impacts of infrastructure projects wherever possible.

Identify opportunities for open spaces, trails and parks along streams and other recreational areas in the watershed that can be incorporated into water supply, water quality, or flood protection projects.

Opportunities for recreation projects can often be associated with other water management strategies, where it is appropriate and economically feasible.

Identify and integrate elements from appropriate Federal and State species protection and recovery plans and from other similar plans (e.g., SWRCB Critical Coastal Areas Program) that are applicable to the region.

Species recovery plans have been written for both steelhead and CRLF that are applicable to the Region. Where feasible, recommended elements from these plans should be incorporated into strategies and projects. The Watershed Action Plan for Carmel River Watershed Assessment included a list of recommended projects and measures for helping to restore ecosystem function in the Carmel River Basin (CRWC, 2004). This list, as well as management strategies for other areas in the Region, will be used to develop a plan to conserve, restore and enhance sensitive species and Special-Status species within the Region.

4.3.5 Regional Communication and Cooperation

Meet or exceed State and Federal regulatory orders.

The Water Management Group and Stakeholder Group seek to comply with all State and Federal regulatory orders through inter-agency communication and cooperation, including information sharing and regional planning.

Identify strategies for protecting both infrastructure and environmental resources.

Regional collaboration is an effective method for identifying ways to protect infrastructure and environmental resources.

Foster collaboration between regional entities to minimize and resolve potential conflicts and to obtain support for environmentally responsible water supply solutions.

Partnering between agencies will create an open forum where the most effective projects can be paired with the most environmentally responsible methods. Collaborations between regional entities and stakeholders that are based on mutual understanding and respect can help avoid unnecessarily long deliberations.

Build relationships with State and Federal regulatory agencies and other water forums and agencies to facilitate the permitting, planning and implementation of water-related projects.

Numerous agencies and water forums are involved in project development. Fostering relationships that promote a streamlined process for information exchange will minimize economic strain from unnecessarily long project execution times.

Identify opportunities for public education about the need, complexity, and cost of strategies, programs, plans, and projects to improve water supply, water quality, flood management, coastal conservation, and environmental protection.

In addition to being an important public service, providing information to the public about the robust nature of water management strategies will help in regional decision making by promoting educated public participation.

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Chapter 5 Water Management Strategies and Integration

IRWM Standards D and E

This section documents the range of water management strategies considered to meet the objectives. All of the required strategies are included in this section.

This section also presents the mix of water management strategies selected for inclusion in the Plan and discusses how these strategies work together to provide reliable water supply, protect or improve water quality, and achieve other objectives. Included in this section is a discussion of the added benefits of integration of multiple water management strategies.

The next step in the integrated planning process was to choose the appropriate water management strategies to meet the planning objectives. All strategies recommended in the State IRWM guidelines were initially considered for inclusion in the plan, but not all strategies were found to be feasible. Once the strategies were considered, they were evaluated based on how they could, in combination or individually, align with the planning objectives. This section describes the strategies contained in this IRWMP. Also included in this section is the process by which the strategies were integrated into a cohesive arrangement that will meet regional objectives.

5.1 Water Management Strategy Consideration

5.1.1 Strategy Consideration Process

As shown in **Table 5-1**, both required and optional strategies were considered in developing an IRWMP that meets minimum IRWM standards. Appropriate water management strategies for this Plan were identified based on a review of strategies, actions and opportunities identified in local plans and in discussions at stakeholder and TAC workshops. The strategies listed in **Table 5-1** were each considered based on their applicability to the planning Region and their ability to fulfill the planning objectives. Integrated planning must include several water management strategies to achieve regional objectives. However, it was also understood that not all of the strategies considered would necessarily be included in the plan. Section 5.2 summarizes the consideration and integration of the water management strategies.

5.1.2 Strategies

Ecosystem Restoration

Ecosystem restoration improves the condition of modified natural landscapes and biotic communities to provide for the sustainability and for the use and enjoyment of those ecosystems by current and future generations. Ecosystem restoration can include changing the flows in streams and rivers, restoring fish and wildlife habitat, controlling waste discharge into streams, rivers, lakes or reservoirs, or removing barriers in streams and rivers so salmon and steelhead can spawn. There are many opportunities for ecosystem restoration in the Monterey Peninsula Region. Opportunities include aquatic habitat restoration along the Carmel River as well as ecosystem restoration at Carmel River lagoon.

The Lower Carmel River Restoration and Floodplain Enhancement project is one project that directly incorporates the water management strategy of ecosystem restoration by allowing river flows to occupy areas of the floodplain that are currently in agricultural use and protected from most floods by a levee. Other projects effect ecosystem restoration indirectly, such as the projects in the Seaside Basin to increase percolation into the aquifers and reduce dependence on Carmel River sources.

Table 5-1: Water Management Strategies

Water Management Strategy	Included in this Plan	Considered	Required to Meet Min. Plan Standards
Ecosystem Restoration	✓	✓	✓
Environmental and habitat protection and improvement	✓	✓	✓
Water Supply Reliability	✓	✓	✓
Flood management	✓	✓	✓
Groundwater management	✓	✓	✓
Recreation and public access	✓	✓	✓
Storm water capture and management	✓	✓	✓
Water conservation	✓	✓	✓
Water quality protection and improvement	✓	✓	✓
Water recycling	✓	✓	✓
Wetlands enhancement and creation	✓	✓	✓
Conjunctive use	✓	✓	
Desalination		✓	
Imported water		✓	
Land use planning	✓	✓	
NPS pollution control	✓	✓	
Surface storage	✓	✓	
Watershed planning	✓	✓	
Water and wastewater treatment	✓	✓	
Water transfers		✓	

Environmental and Habitat Protection and Improvement

Protecting and improving the habitat of threatened and endangered species of plants and animals in the Region is an important aspect of water related planning. State and Federal species recovery plans for steelhead and the California red-legged frog describe several important resource areas to enhance and conserve including habitat along the Carmel River, its tributaries, and at the Carmel River Lagoon. Several projects in this IRWMP are proposed that will assist in restoring streamside habitats in the Carmel River watershed and will include monitoring in these areas for improvements in the populations of sensitive species.

Protection of the Monterey Bay National Marine Sanctuary (MBNMS) and State designated Areas of Special Biological Significance (ASBS) are also of key importance. As described in the Water Quality Objectives, the six Minimum Control Measures being implemented as part of the MRSWMP will improve near-shore water quality. However, the level and type of protection for ASBS is currently under discussion between RWQCB 3 and the ASBS dischargers in the planning Region.

Water Supply Reliability

Water supply reliability can be achieved through programs and projects that reduce water diversions from the Carmel River Basin and improve the hydrologic balance and water quality in the Seaside Groundwater Basin (SGB). The dependence on rainfall to replenish water-bearing aquifers and lack of

surface storage puts the Region at risk of severe cutbacks in water use during drought periods lasting as little as two years. Increased recycling of municipal wastewater and conjunctive use of storm water may help to diversify the water supply sources. Securing a reliable water supply is one of the highest priorities in the Region and is critical to reducing impacts to the environment such as seawater intrusion and reduced summer-time surface flows.

The Aquifer Storage and Recovery Project, the Seaside Basin Groundwater Replenishment Project, and the Seaside 90" Outfall Infiltration Component Project will directly improve water supply reliability and reduce the potential for seawater intrusion of the aquifers in the SGB. In these projects, surplus surface water (Carmel River winter flows, treated storm water runoff, and infiltrated storm water runoff in Seaside) can be used during wet months to recharge aquifers in the SGB. Groundwater extraction in the SGB during dry months will reduce diversions from the Carmel River Basin. Additionally, enhanced recharge of the SGB will reduce the overdraft and reduce the potential for seawater intrusion in this basin.

Flood Management

The Monterey County Water Resources Agency is responsible for flood management throughout the unincorporated portions of Monterey County. Flood protection along the Carmel River and in the Canyon Del Rey watershed is a significant challenge and an important aspect of surface water related planning in those areas. Portions of the Carmel Valley floodplain have the highest repetitive loss rate in the County (defined as two or more flood insurance claims in a ten-year period). The March 10, 1995 flood (estimated peak magnitude of 16,000 cubic feet per second or about a 40-year return flood) damaged 700 residences and 68 businesses and caused the evacuation of most people in the floodplain. In addition, two 80-foot spans of the Highway 1 Bridge were washed away. Projects to reduce flooding in Carmel Valley are expected to be a high priority in the Region.

The Lower Carmel River Restoration and Floodplain Enhancement project incorporates a significant component of flood management. There will also be flood management benefits from projects in the Seaside Basin to reduce stormwater flows to Monterey Bay and from projects in the Cities of Pacific Grove and Monterey to reduce stormwater flows to ASBS.

In the six Monterey Peninsula Cities and in Pebble Beach, flooding problems appear to be localized and typically affect far fewer residents and structures than in most of the unincorporated areas. However, storm drain systems in these areas discharging to ASBS can be overwhelmed by high flows, which presents a significant challenge in finding a method to reduce or cease wet weather discharges to ASBS.

Groundwater Management

Because the Region relies on groundwater production for virtually all of its water supplies, a sound groundwater management strategy is both critical and necessary. In the Carmel River Basin, the State Water Resources Control Board (SWRCB) determined that it has jurisdiction over the water flowing in the Carmel River Aquifer, which supplies about 70% of potable water for the Region. SWRCB has set a requirement of reducing diversions from that aquifer by approximately 75% over the historical usage (SWRCB Order No. WR 95-10).

In the Seaside Groundwater Basin, which supplies about 20% of the potable water in the Region, the Superior Court of California adjudicated rights in the basin in 2006 and instituted a schedule for bringing the groundwater budget into balance. The Court's decision will also play a key role in how this strategy is implemented overall in the Region.

Groundwater management is a key strategy in the Aquifer Storage and Recovery Project, the Seaside Basin Groundwater Replenishment Project, and the Seaside 90" Outfall Infiltration Component Project. Projects to reduce stormwater discharges to ASBS may also incorporate groundwater recharge if capture and treatment is proved feasible.

Recreation and Public Access

Clearly, the Region has wide appeal to those who enjoy sport fishing, kayaking, sailing, hiking, camping, surfing, cycling, photography, or a nice walk on the beach. Recreation and public access are important aspects of water resource planning and are integral to the economic base of the Region, particularly as related to access in the Carmel River watershed and to the coast. While public access to the San Clemente Reservoir is currently prohibited, access to the Los Padres National Forest and the Ventana Wilderness is allowed at Los Padres Dam and Reservoir, offering some of the most breathtaking settings for outdoor recreation in the State. Maintaining and expanding access to beaches, as required by the California Coastal Act, and to other recreational areas will continue to be an important consideration in future water resources projects.

Storm Water Capture and Management

Storm water runoff is described by the Environmental Protection Agency as “That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, underflow, or channels or is piped into a defined surface water channel or a constructed infiltration facility (Washington Department of Ecology, 1992).” These types of flows can be contaminated with pollutants that are generated through a multitude of sources, but are typically lumped into two categories—urban and agricultural runoff.

Typical pollutants detected in urban and suburban runoff include trash, metals, detergents, pesticides, sediment, nutrients and pathogens. Agricultural activities, including animal grazing, can produce nitrates, other nutrients, pathogens, and unnatural turbidity levels in nearby waterbodies. The effects of storm water runoff can be seen when beaches are closed or in the case of foam coffee cups and plastic bags that wash into storm drains and mounds of trash that pile onto local beaches during storm events. Or they can be less noticeable, such as when runoff creates toxic conditions for wildlife.

According to the Monterey Bay National Marine Sanctuary, volunteer monitoring in several Monterey Bay area cities has shown that urban runoff contains some of these pollutants and may be contributing to increased mortality among marine mammals. The effects are not restricted to the environment, and can affect public health and cause economic losses from repeated beach closings and water quality warnings resulting from pathogens leaked from failing infrastructure or from human or animal wastes in the watersheds.

The RWQCB recently approved the Monterey Regional Storm Water Management Plan (MRSWMP) and issued a Phase II NPDES permit for storm water discharges within the Region in Sept 2006. Best Management Practices contained in MRSWMP should lead to an improvement in the future of near-shore water quality along the coast and in streamside areas affected by storm water discharges.

At present, requirements concerning discharges to the Carmel Bay and Pacific Grove ASBS are under discussion and study. Pacific Grove has completed two phases of a project to divert a portion of dry season flows away from the Pacific Grove ASBS, and the City of Monterey completed an alternatives analysis in 2006 for ceasing discharges in ASBS from Monterey, Pacific Grove, and Pebble Beach.

This IRWM Plan contains several projects in the planning stages for determining the feasibility of capturing and/or managing storm water. Project scopes include investigating enhanced infiltration of runoff in local watersheds combined with diversion of discharges to the sanitary sewer system for treatment and recycling. When fully implemented, these projects may supply water for irrigation at local parks and open space areas or treated water would be injected or allowed to percolate into local aquifers to improve water quality and increase water quantity. See Chapter 7 for detailed project descriptions.

Water Conservation

The Monterey Peninsula area is tied with San Francisco and Eureka for the lowest per capita water consumption level in California²³ and is aggressively pursuing a water conservation program that includes education and conservation incentives. Given the legal and physical constraints to water supply in the Region and the demonstrated effectiveness of conservation, continuance and further development of this program, especially in the area of landscape and outdoor irrigation uses, is likely to be a key strategy in reducing reliance on limited local water supplies.

Water Quality Protection and Improvement

Surface water and groundwater quality protection and improvement are strategies that are very important for inclusion in integrated planning. Projects that include these aspects of water management are anticipated to be high priority for the region.

Water Recycling

Recycling of wastewater for Pebble Beach golf course irrigation has proven to be effective in reducing potable water demand. Recycling of tertiary-treated water to the Carmel River Lagoon that would otherwise be discharged to Carmel Bay is also being considered as a method to augment the lagoon during the summer to enhance aquatic environments. However, recycled water from the CAWD plant on the Carmel River may not meet all of the stringent water quality requirements under the Clean Water Act for discharges to the Lagoon, which is considered waters of the United States. Efforts are currently underway to explore ways to use this water at the lagoon and comply with all requirements for surface water discharges. In the future, increasing the use of recycled water in urban settings and for use in the Seaside Groundwater Basin will be an important water supply alternative.

Wetlands Enhancement and Creation

Much of the Region is either somewhat arid rolling hills in the rain shadow of the Santa Lucia range or very rugged terrain with sedimentary deposits in canyon bottoms or low-gradient areas. While there does not appear to be extensive areas that would support the development of wetlands, opportunities for restoring or enhancing wetlands exist in public lands adjacent to the lower Carmel River and to a much lesser extent in the Canyon Del Rey watershed. Projects, such as the CAWD Micro Filtration/Reverse Osmosis facility now under construction to provide excess capacity, could address wetlands and be a part of water resource management planning.

Conjunctive Use

Optimizing conjunctive use of the Carmel River, its groundwater basin, and the Seaside Groundwater Basin is critical for the region's water supply as well as for the quality of both the surface and groundwater in the region. The region lacks sustainable surface water storage and use of the Carmel River Aquifer to store water is currently restricted. The Seaside Groundwater Basin is the most effective storage mechanism within the region. However, this area is subject to use restrictions as a result of a recent adjudication in the basin. Therefore, while conjunctive use is an important aspect of water supply planning, there are limitations to using this strategy.

Desalination

Desalination has been used in the Region and surrounding area at a small scale, with plants located at the Monterey Bay Aquarium and in the City of Marina. While a large scale plant has yet to be built and operated, desalination continues to be investigated as a water supply in satisfy requirements for replacement water supplies and to help protect the region from drought. This strategy is being actively pursued by both public and private entities in the Region. However, recent proposals have focused on locating facilities outside of the Region. Land-based desalinating facilities would require locating

²³ Black and Veatch, 2006

treatment, pumping, and pipeline facilities outside of the Region to deliver water to the area and could require modifications to existing infrastructure within the Region. Sea-based facilities, which would be located several miles offshore and would require significant infrastructure upgrades at the coast, are also being investigated.

The California Public Utilities Commission (CPUC) held public scoping meetings in the Region in October 2006 to receive community input on the scope of alternatives to be included in the Environmental Impact Report (EIR) that it is preparing on a proposed desalination plant in Moss Landing, which California American Water Company (Cal-Am) has submitted for CPUC approval.

Desalination could be combined with other water supply projects within the Region, such as aquifer storage and recovery in the Seaside Groundwater Basin, to meet the Region's potable water supply needs.

Imported water

The agencies managing the water supply in the Region have considered importing water from other areas, but no feasible projects have emerged. A number of importation and water marketing alternatives have been studied since at least 1988 and were found not to be economically or environmentally feasible. It is believed that the existing water supplies in the Region can be managed and augmented with desalinated water to provide a reliable, sustainable quantity of water without the need to import from other purveyors. Therefore, this strategy was not considered as part of the planning process.

Land use Planning

Land use has a dramatic influence on available water supply, water demand, and can impact water quality. It is important that Monterey County and regional cities coordinate land use planning in a way that mitigates negative impacts. Voters recently approved an update to the Monterey County General Plan that allows for an increase in population and an intensification of land use in specific areas within the County. However, these changes are not expected to impact land use within the Region.

Non-point Source (NPS) Pollution Control

NPS pollution control is important for maintaining surface and groundwater quality in this biologically sensitive region. Several entities within the Region are implementing a storm water management program in the urban portions of the Region in compliance with Phase II requirements of the National Pollution Discharge Elimination System for storm water.

Surface Storage

Surface storage of recycled water to recharge the Seaside Groundwater Basin may be considered as part of the overall water supply planning process. Opportunities in the Carmel River Basin for significantly enlarging the capacity of existing reservoirs (e.g. by dredging or building a higher spillway) or construction of new reservoirs are limited by economic, safety, and environmental constraints and is not considered to be feasible at this time. Maintenance dredging of the Los Padres Reservoir to retain existing storage capacity has been considered as an option, but no definitive analysis or proposal has been carried out. In general, other areas in the Region are either environmentally sensitive or are urban areas that are not suitable for surface storage.

Watershed Planning

The Carmel River Watershed can be managed for recreation, flood control, water supply, water quality, and environmental habitat considerations. Watersheds within the Seaside Basin can be managed for water supply, water quality, and may have some environmental habitat and recreation components. Other watersheds that drain directly to the Pacific Ocean (e.g., within Pebble Beach and the Cities of Carmel-by-the-Sea, Pacific Grove and Monterey) can be managed for recreation, water quality, and environmental habitat. All of these watershed planning strategies should be included in the planning process as it relates to surface and groundwater supply.

Water and Wastewater Treatment

As water supplies change in the Region - including the potential for developing new water supplies for urban use - water and recycled water (wastewater) treatment plants may need to be built depending on the quality and source of water supplies.

Water Transfers

Intra-regional transfer of potable water is already a proven strategy between the Carmel River Basin and the Seaside Groundwater Basin and is expected to be a significant component in resolving both Regional supply and water quality issues in the Seaside Groundwater Basin. One-way inter-regional transfer of wastewater currently occurs from the Monterey Peninsula to the Salinas Valley MRWPCA plant along the Salinas River. Importation of treated wastewater (recycled water) back into the Region from this plant is expected to provide additional non-potable supply to the area. Intra-regional transfer of recycled water currently occurs between the mouth of the Carmel River (from the CAWD treatment plant) to golf course areas in Pebble Beach.

5.2 Integration of Strategies and Objectives

Because strategies are used and objectives met through specific actions, these actions are best described by the projects proposed in this Plan. Detailed project descriptions are contained in Chapter 7 and the selection process is described in Chapter 6. This section describes how proposed projects will utilize appropriate water management strategies to meet planning objectives. The scopes of these projects were first matched with strategies and then with planning objectives. Many of the projects use a multi-strategy approach that is interrelated and meets several objectives. For example, the Seaside Groundwater Basin ASR Project combines conjunctive use with groundwater management, which results in effecting additional water management strategies including ecosystem restoration, water supply reliability, and water quality protection. This achieves many of the objectives set out in this Plan. The use of multiple strategies can meet several Plan objectives and improve overall performance of the package of projects. This understanding guided project development and the strategy integration process.

5.2.1 Matching Projects with Strategies

In order to better understand intersections and synergies of strategies and to evaluate them, a matrix was used to match proposed projects with each of the identified strategies, as shown in **Table 5-2**. All the proposed projects use multiple strategies.

5.2.2 Matching Projects with Objectives

Similar to the manner that strategies were evaluated, **Table 5-3: Matching Projects with Objectives** shows how projects meet plan objectives. Every proposed project accomplishes several objectives, which is consistent with IRWM planning standards that encourage the use of multiple water management techniques to accomplish goals and objectives.

Table 5-2: Matching Projects with Strategies

Projects	Sponsor	Water Management Strategy																			
		Strategies	Ecosystem Restoration	Environmental and Habitat Protection and Improvement	Water Supply Reliability	Flood Management	Groundwater Management	Recreation and Public Access	Storm water Capture and Management	Water Conservation	Water Quality Protection and Improvement	Water Recycling	Wetlands Enhancement and Creation	Conjunctive Use	Desalination	Imported Water	Land Use Planning	NPS Pollution Control	Surface Storage	Watershed Planning	Water and Wastewater Treatment
Refine ASBS Alternatives	Monterey/PG	✓	✓	✓		✓	✓	✓		✓	✓		✓					✓	✓		
Aquifer Storage and Recovery	MPWMD	✓	✓	✓		✓				✓			✓								
Seaside Basin Groundwater Replenishment	MRWPCA	✓		✓		✓				✓	✓		✓								✓
CSUMB Storm water Percolation and Education	CSUMB	✓	✓					✓				✓	✓			✓			✓		
Carmel River Watershed Volunteer Monitoring Program	CRWC	✓	✓				✓			✓							✓		✓		
Lower Carmel River Restoration and Floodplain Enhancement	BSLT	✓	✓		✓		✓	✓		✓		✓				✓			✓		
Seaside 90" Outfall Infiltration Component	Seaside		✓	✓	✓	✓	✓	✓		✓		✓	✓				✓				
Water Conservation Retrofit Program	MPWMD	✓	✓	✓		✓			✓												
Sanitary Sewer System Repair and Replacement in the Cities of Monterey and Pacific Grove	Monterey/PG							✓		✓											✓
Implementation of Solid Waste Removal Technology	Monterey/PG		✓			✓				✓											
Microbial Source Tracking in the Cities of Monterey and Pacific Grove	Mont/PG/Foundation					✓		✓		✓											

Table 5-3: Matching Projects with Objectives

Project	Sponsor	Water Supply						Water Quality				
		Objectives	Meet water supply targets	Maintain the quantity and quality of water in the Seaside Groundwater Basin	Minimize the impacts to sensitive species and habitats from diversions .	Maximize use of recycled water	Evaluate, advance, or create existing conservation efforts throughout the Region.	Optimize conjunctive use of surface and groundwater.	Meet or exceed applicable water quality standards established by regulatory processes or by stakeholders	Improve water quality for environmental resource use.	Meet or exceed recycled water quality targets established by stakeholders	Minimize impacts from storm water (or urban) runoff through implementation of Best Management Practices or other alternatives
Projects												
Refine ASBS Alternatives	Monterey/PG	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
Aquifer Storage and Recovery	MPWMD	✓	✓	✓	✓		✓	✓	✓			
Seaside Basin Groundwater Replenishment	MRWPCA	✓	✓		✓			✓	✓	✓		
CSUMB Storm water Percolation and Education	CSUMB							✓	✓		✓	✓
Carmel River Watershed Volunteer Monitoring Program	CRWC			✓				✓	✓			
Lower Carmel River Restoration and Floodplain Enhancement	BSLT							✓	✓		✓	✓
Seaside 90" Outfall Infiltration Component	Seaside	✓	✓	✓			✓	✓	✓		✓	
Water Conservation Retrofit Program	MPWMD	✓	✓			✓						
Sanitary Sewer System Repair and Replacement in the Cities of Monterey and Pacific Grove	Monterey/PG							✓	✓		✓	✓
Implementation of Solid Waste Removal Technology	Monterey/PG								✓		✓	
Microbial Source Tracking in the Cities of Monterey and Pacific Grove	Mont/PG/ Foundation								✓		✓	

Table 5-3: Matching Projects with Objectives

Projects	Sponsor	Flood Protection and Erosion Prevention				Environmental Protection and Enhancement					Regional Communication and Cooperation				
		Develop regional projects and plans necessary to protect existing infrastructure and sensitive habitats from flood damage and erosion resulting from the 100-year event	Develop approaches for adaptive management that minimize maintenance and repair requirements, protect quality and availability of water while	Protect quality and availability of water while preserving or restoring ecologic and stream function	Provide community benefits beyond flood protection	Identify opportunities to assess, protect, enhance, and/or restore natural resources when developing	Protect and enhance sensitive species and their habitats in the regional watersheds	Minimize adverse effects on biological and cultural resources when implementing strategies and projects	Identify opportunities for open spaces, trails and parks along streams and other recreational areas in the watershed that can be incorporated into water supply, water quality, flood protection, or environmental restoration projects	Identify and integrate elements from appropriate Federal and State species protection and recovery plans and from other similar plans that are applicable to the region	Meet or exceed State and Federal regulatory orders, provided that mandates are funded	Identify strategies for protecting both infrastructure and environmental resources	Foster collaboration between regional entities to minimize and resolve potential conflicts and to obtain support for environmentally responsible water supply solutions	Build relationships with State and Federal regulatory agencies and other water forums and agencies to facilitate the permitting, planning and implementation of water-related projects	Identify opportunities for public education about the need, complexity, and cost of strategies, programs, plans, and projects to improve water supply, water quality, flood management, coastal conservation, and environmental protection
Refine ASBS Alternatives	Monterey/PG					✓	✓	✓		✓	✓	✓	✓		
Aquifer Storage and Recovery	MPWMD							✓		✓	✓	✓	✓		
Seaside Basin Groundwater Replenishment	MRWPCA							✓		✓	✓	✓	✓	✓	
CSUMB Storm water Percolation and Education	CSUMB	✓	✓		✓	✓	✓	✓			✓	✓	✓	✓	
Carmel River Watershed Volunteer Monitoring Program	CRWC					✓	✓	✓	✓	✓	✓	✓	✓	✓	
Lower Carmel River Restoration and Floodplain Enhancement	BSLT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Seaside 90" Outfall Infiltration Component	Seaside	✓		✓	✓		✓			✓	✓	✓			
Water Conservation Retrofit Program	MPWMD						✓	✓		✓	✓	✓	✓	✓	
Sanitary Sewer System Repair and Replacement in the Cities of Monterey and Pacific Grove	Monterey/PG	✓	✓				✓	✓		✓	✓	✓		✓	
Implementation of Solid Waste Removal Technology	Monterey/PG						✓	✓		✓	✓	✓			
Microbial Source Tracking in the Cities of Monterey and Pacific Grove	Mont/PG/ Foundation	✓	✓			✓					✓	✓			

5.2.3 Benefits of Integrating Strategies

There are several benefits to integrating management strategies including:

- **The ability to address a broad range of water management goals and Regional priorities**

Accomplishing water management goals often requires implementation of several water management strategies. Recognizing where strategies can overlap or complement each other helps to develop well-rounded solutions that can address complex problems. An example of strategy integration in this Plan are several proposed projects to optimize the use of the Seaside Groundwater Basin and meet Regional priorities including finding a replacement water supply, improving groundwater management, reducing discharges to ASBS, and dealing with storm water discharges to the Monterey Bay (e.g., ASR Project, Refining ASBS Alternatives, Seaside Groundwater Replenishment Project, Seaside 90-Inch Outfall Infiltration Component).

- **Multiple benefits yield multiple funding sources**

The integration of regional strategies will allow the region to apply for IRWM Implementation money administered by the State. Additionally, the resulting wide range of benefits will allow the key stakeholders to obtain funding from various sources for the implementation of high-priority projects.

- **Ability to optimize regional efforts**

Water resource agencies are often constrained in solving problems by their particular missions or political boundaries, while problems are often complex and cross political boundaries. This can lead to sub-optimal solutions across a Region, or overlapping and duplication of strategies. Integrated regional planning offers a chance for stakeholders to enter into open forums with each other, thus optimizing efforts and resources that support the same goal while also offering a niche for strategies that might not be feasible to implement independently.

- **The ability to promote intra-regional cooperation**

The integration of multiple strategies will encourage intra-regional communication by channeling various strategies into a single goal or project. Stakeholders and water agencies will be encouraged to work collaboratively toward a successful project. Collaboration in one arena can lead to cooperation and collaboration in other areas of mutual benefit.

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Chapter 6 Regional Priorities

IRWM Standard F

This section includes priorities for implementation of the Plan and sets short-term and long-term measurable objectives. The process for modifying priorities in response to regional changes is also discussed.

This section outlines the priorities in the Region and sets short-term and long-term goals to meet those priorities. Priorities were determined based on their role in meeting regional goals and objectives. The Stakeholder Group, which includes the Water Management Group, developed a process that identifies and prioritizes projects that meet multiple goals and objectives and that would address priorities within the Region.

6.1 Procedure for Developing Regional Priorities

The process followed by the Stakeholder Group for identifying pertinent goals and objectives and then prioritizing regional projects under those goals and objectives consisted of four key steps. These were as follows:

1. **Describe water-related issues.** There are several issues that the Region has grappled with for many years including limited water supply, decline of sensitive species, storm water management, groundwater management, flooding and erosion. Through a community outreach program, workshops, and deliberation with stakeholders, the Water Management Group, TAC and Stakeholder Group identified the specific water-related issues to be addressed by this IRWMP.
2. **Develop Criteria.** The Stakeholder Group and TAC considered criteria described in Section 6.1.1 in setting regional priorities.
3. **Refine Priorities.** The Stakeholder Group developed a draft set of priorities based on individual entity responsibilities, strategic plans, and short and long term goals. At a stakeholder meeting in December of 2006, a Technical Advisory Committee (TAC) was appointed to refine the priorities using the Priority Criteria described in Section 6.1.1, review project descriptions, and make recommendations about a prioritized suite of projects to the Stakeholder Group.
4. **Prioritization.** The TAC met regularly throughout the first half of 2007 to deliberate and refine priorities and develop a project scoring process. As a result of these workshops, a suite of projects was identified for inclusion in the Plan and a process to modify the Plan and project list in the future was determined.

6.1.1 Criteria Used to Identify Regional Priorities

As previously noted, the Stakeholder Group developed and applied several criteria in the refinement of the Regional goals and objectives under which the projects would be prioritized. These criteria were as follows:

- benefit multiple agencies and stakeholders or large portions of the Region;
- meet water supply goals, improve or protect environmental resources, and improve existing infrastructure;
- avoid negative impacts to infrastructure, water supply, or environmental resources; and/or
- comply with Federal or State regulations.

If conditions should warrant a priority change or change in objectives, the Water Management Group can use these criteria to steer new priority development. See Section 6.4 “Process for Modifying Priorities” for more information on the process identified to modify priorities.

6.1.2 Priorities

Based on the priority development process described above, the following priorities were identified as Regional priorities for project evaluation:

- Meet current replacement supply and future demand targets for water supply and support the Seaside Groundwater Basin Watermaster to implement the physical solution in the Basin
- Reduce the potential for flooding in Carmel Valley and at the Carmel River Lagoon
- Mitigate effects of storm water runoff throughout the region
- Address storm water discharges into ASBS
- Promote the steelhead run

Each of these priorities is discussed in more detail below.

Meet current replacement supply and future demand targets for water supply and support the Seaside Groundwater Basin Watermaster to implement the physical solution in the Basin

As described in Section 4.3.1, the State Water Resources Control Board (SWRCB) ordered in 1995 that a replacement supply must be found for the unauthorized use of up to 10,730 AFA from the Carmel River Basin. Solutions to this problem have been proposed by CAW and MPWMD, but have been turned down either during environmental review or after CEQA certification by the voters within the Region. Although water use in the Region has been reduced on an interim basis as required under SWRCB Order WR 95-10, impacts to the environment, and in particular, the steelhead fishery, continue.

In 2005, technical studies concluded that the Seaside Groundwater Basin is in a state of overdraft and could be threatened with seawater intrusion if steps were not taken to reverse the decline. A water rights adjudication in 2006 for the Seaside Groundwater Basin articulated the importance of this issue to both sustainable and legal management of water supplies in the Region. The Court-ordered physical solution declares and addresses the overdraft by reducing the threat of seawater intrusion. The current operating yield in the Seaside Groundwater Basin, the only other water supply source in the Region, is set at 5,600 AFA. Beginning in January 2009, a phased ramp-down in production over a period of 15 years to the natural safe yield of 3,000 AFA is scheduled to begin if an equivalent amount of replenishment water is not found to offset excessive groundwater production. If groundwater is produced in excess of targeted levels (without replacing the water), replenishment assessments will be imposed on CAW and other producers for exceeding the court-ordered allocations.

A replacement supply of 12,500 AFA is needed to meet these requirements and additional future demand for General Plan Buildout is estimated at 4,550 AFA. Therefore, the total supply required to meet current replacement supply and future demand is 17,050 AFA.

Reduce the potential for flooding in Carmel Valley and at the Carmel River Lagoon

There are 94 Repetitive Loss Properties (RLP) in Carmel Valley. There are approximately 1,700 properties subject to flooding within the 100-year floodplain of the Carmel River. The March 10, 1995 flood (estimated peak magnitude of 16,000 cubic feet per second or about a 40-year return flood level) damaged 700 residences and 68 businesses and caused the evacuation of most people in the 100-year

floodplain. In addition, two 80-foot spans of the Highway 1 Bridge were washed away during the flood and required that a new bridge be built across the river.

The Carmel River Lagoon is immediately adjacent to and affects Critical Coastal Watershed Area No. 44 (Carmel Bay). Under natural conditions, the barrier beach at the mouth of the Carmel River builds up from wind and wave action and a lagoon forms behind the beach. Low-lying structures near the Lagoon are subject to flooding and damage from both the Carmel River and ocean waves filling the Lagoon when the barrier beach at the mouth of the Lagoon prevents outflow. The Lagoon, which is recognized as a critical habitat for steelhead and CRLF, requires frequent actions at the mouth to avoid flood and erosion damage. The use of bulldozers to cut through the barrier beach to lower the Lagoon water surface has come under increasing criticism by State and Federal resource managers as the emergency breaching affects several stages of the steelhead life cycle and reduces the habitat value for all aquatic species in the Lagoon.

Mitigate effects of storm water runoff throughout the Region

The RWQCB issued a Phase II NPDES permit in November 2006 for storm water discharges within the Region and approved the Monterey Region Storm Water Management Plan (MRSWMP). MRSWMP contains six Minimum Control Measures that are being implemented currently and will likely improve near-shore water quality along the coast and in some streamside areas affected by urban discharges.

The following entities are signatories to the Agreement for implementing and are participants in the Monterey Regional Storm Water Management Program:

- City of Pacific Grove, a municipal corporation of the State of California;
- City of Monterey, a municipal corporation of the State of California;
- City of Seaside, a municipal corporation of the State of California;
- City of Sand City, a municipal corporation of the State of California;
- City of Del Rey Oaks a municipal corporation of the State of California;
- City of Marina, a municipal corporation of the State of California; [note: this city is outside of the Planning Region]
- County of Monterey, a political subdivision of the State of California.

The Pebble Beach Company and the City of Carmel-by-the-Sea are coordinating entities that coordinate storm water activities with the participants in the MRSWMP.

Address storm water discharges into Areas of Special Biological Significance

In December 2004, Regional Water Quality Control Board (RWQCB or Regional Board) Region 3 adopted its intent to issue a Cease and Desist Order (CDO) to the City of Pacific Grove, the City of Monterey, the City of Carmel-by-the-Sea, and the Pebble Beach Company requesting that they provide a response as to whether they intend to apply for an exception to the California Ocean Plan prohibiting discharges to Areas of Special Biological Significance (ASBS) along the coast of California or cease discharges into two ASBS located in coastal waters adjacent to the areas subject to the CDO. After six months of meetings and public hearings, the RWQCB agreed to not issue the CDO and continue to hold hearings to find an equitable solution to their interpretation of the Clean Water Act as it applies to ASBS.

In mid-2006, SWRCB announced a series of public scoping meetings to receive input on the environmental information and process that would be required in order for dischargers to meet water quality requirements for ASBS. Final comments were due to SWRCB by September 1, 2006. In September 2006, RWQCB 3 adopted Resolution R3-2006-0076, which approved the Monterey Region Storm Water Management Program and allows discharges under a general NPDES permit. Among other conditions, the Resolution requires that dischargers to ASBS either cease discharges or obtain an exception to the California Ocean Plan from the SWRCB. Included in this requirement were discharges from Carmel Valley (via the Carmel River), which was an area that was added to the RWQCB Resolution

just days before its adoption. As a result, in September 2006, the City of Monterey and the County of Monterey, on behalf of participants in MRSWMP petitioned the SWRCB for review of this Resolution. The petition included a request that ASBS dischargers be allowed to discharge consistent with standards contained in the MRSWMP²⁴. The Regional Board subsequently did not honor the petition, so the permit requirements relating to ASBS discharges still stands.

In late April 2007, SWRCB notified the City of Pacific Grove that its application package requesting an exception from the California Ocean Plan waste discharge prohibition into the Pacific Grove ASBS was complete. At the same time, the cities of Monterey and Carmel-by-the-Sea and the Pebble Beach Company were notified of a violation of the California Ocean Plan waste discharge prohibition into ASBS. At the time of notification, SWRCB had not received an application package from these entities requesting an exception to the absolute prohibition against discharge to ASBS. The County of Monterey did not receive a similar notice.

While it is unclear how these actions will be resolved and what the requirements for discharges into local ASBS will be, affected stakeholders in the Region have acknowledged that addressing this issue is a high priority. However, maintaining these pristine areas must be accomplished within the economic means available to the Region. An initial investigation was conducted in 2006 of the feasibility of treating and disposing of a portion of dry and wet weather flows currently flowing to the Pacific Grove and Carmel Bay ASBS. It was estimated that costs could run as high as \$16 million in capital costs with an additional 20-year life cycle cost of \$12.2 million²⁵. No estimate was made of the cost of treating and/or ceasing discharges from Carmel-by-the-Sea and Carmel Valley.

Subsequently, in June 2007, the Pebble Beach Company (PBCo) determined that a project to cease discharges from the Pebble Beach area into Carmel Bay would not be economically feasible due to the interruption of golf course operations²⁶. As noted above, PBCo coordinates storm water activities with participants in MRSWMP.

Promote the steelhead run

Between the 1940's and the mid-1970's, adult migration counts at San Clemente Dam often came close to 1,500 fish annually. In 1991, after four years of drought in the Region, only one adult fish was counted at the dam during the entire winter run. Over the past two decades efforts by public agencies, private entities, and non-profit groups to restore this run have met with some success as annual counts have increased to a range of about 400 to 800 in recent years. The estimated carrying capacity of the watershed currently ranges from 3,500 to 4,200 fish annually²⁷.

6.1.3 Other Regional priorities not included in this IRWM Plan

The Stakeholder Group and TAC recognized that there are at least two major planning efforts to address critical Regional needs that could affect water resource management within the Region. These are proposed desalination plants to serve areas near the Monterey Bay and the retrofit of San Clemente Dam. These efforts are not currently included in the scope of this IRWMP as they are both being conducted under the auspices of State agencies – the Public Utilities Commission for most desalination projects and the Department of Water Resources and the State Coastal Conservancy for the San Clemente Dam project. However, as these projects move forward in the planning and design phases, portions of these

²⁴ See Agenda Item 7, October 25, 2006 Meeting and Agenda for the Management Committee of the Monterey Regional Storm Water Pollution Prevention Program.

²⁵ Final Alternatives Analysis and Data Acquisition for the Pacific Grove and Carmel Bay Areas of Special Biological Significance, MACTEC, Prepared for the City of Monterey Department of Public Works, July 2006.

²⁶ Personal communication, Thomas Quattlebaum (PBCO) to Larry Hampson (MPWMD)

²⁷ Section 5.5.1.4 Page 5 of 12 Environmental and Biological Assessment of the Carmel River Watershed, Monterey Peninsula Water Management District. Prepared for the Carmel River Watershed Conservancy, December 2004.

projects may be eligible for funding and implementation under the IRWM program. These two projects are briefly summarized below:

Desalination

There are a variety of proposals in various stages of development to build desalination plants to serve the population located near Monterey Bay, including the cities of the Monterey Peninsula. Most projects are focused on providing replacement supplies to the Monterey Peninsula region. Desalination could provide all of the replacement and future water needs within the Planning region and greatly reduce current impacts on the environment in the planning Region; however, cost, potential environmental impacts outside of the planning Region and other factors must be resolved.

San Clemente Dam Safety

In 1992, the California Department of Water Resources (DWR) concurred with a CAW study that San Clemente Dam is deficient under the design earthquake (maximum credible earthquake) and Probable Maximum Flood loadings. DWR's Division of Safety of Dams has declared San Clemente Dam unsafe and has ordered CAW to remediate the dam. San Clemente Reservoir is virtually full of silt, with more than two million cubic yards of sediment impounded behind the dam. CAW desires to retain the dam as a water diversion point and proposes to strengthen the dam and leave it in place. NOAA Fisheries has stated that the dam and reservoir present a barrier to steelhead migration and believes the dam should be removed in order to foster the recovery of the species. U.S. Fish and Wildlife Service staff considers the wetlands that have developed in the reservoir silts as important habitat for threatened California red legged frogs.

The Department of Water Resources Division of Safety of Dams and the Corps jointly prepared a Draft EIR/EIS on a project to strengthen the dam and four alternatives to strengthening, each of which may significantly change the habitat of the Carmel River downstream of the dam. The Final EIR/EIS is expected to be completed in late 2007.

The Carmel River Reroute and Dam Removal (CRRDR) is described in the San Clemente Dam Seismic Safety Project Draft EIR/EIS as a project alternative to dam safety modifications. This project alternative will mitigate dam stability concerns by removing the dam and rerouting the Carmel River. Recognizing additional benefits to the public that would result from the CRRDR, several organizations have been working with CAW to further consider and enable this alternative for implementation as the preferred project. The California State Coastal Conservancy (SCC) has been appointed as the lead state agency in this process, and is spearheading supplemental technical studies to support this effort. The goals for the supplemental studies are to: 1) provide sufficient information to enable consensus among the parties on a feasible strategy for removing the dam; and 2) prepare the CRRDR for the permitting and final design phases. The additional studies are expected to be completed in early 2008.

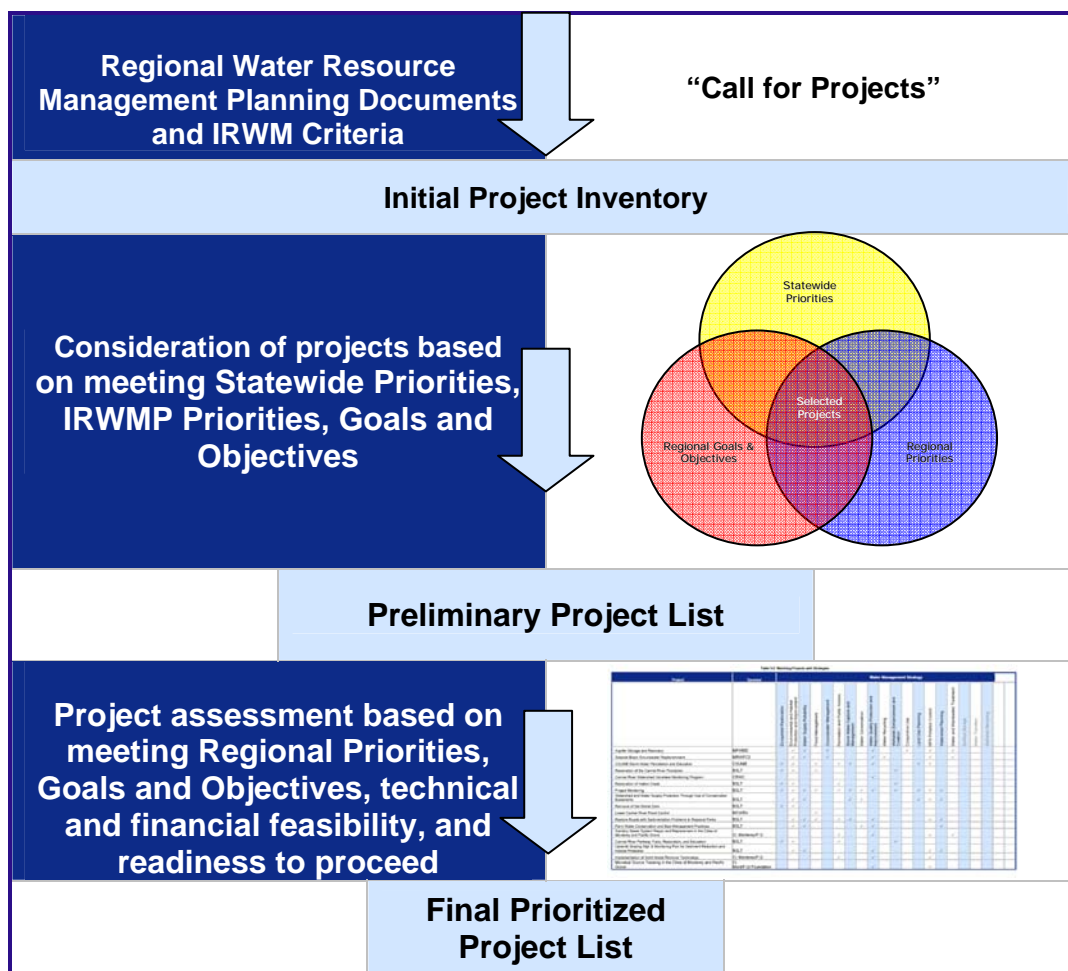
6.2 Compilation and Prioritization of Projects

It is the goal of the planning process to coalesce independent projects into integrated, regional efforts. In recent years, planning documents involving water supply, watershed management, water quality compliance, water conservation, water recycling and other water resource management activities have identified potential projects and programs in the Region. Stakeholders used these planning documents as well as criteria developed for this IRWMP to identify projects. All stakeholders involved in the development of the IRWMP were invited to submit projects for inclusion in this IRWMP. Through a series of workshops, the TAC developed a prioritization assessment and scoring method, which was then used to identify projects to be recommended for inclusion in the IRWMP in order to achieve the goals and objectives in Chapter 4. To be considered for inclusion, projects must meet minimum requirements including using IRWM strategies, meeting Regional goals and objectives, and being technically and

financially feasible. An overview of the selection process is shown in **Figure 6-1** and discussed in more detail in Section 6.2.2.

While the initial project inventory contained all suggested projects, an assessment process was subsequently developed to determine which projects would best meet the goals and objectives described in Chapter 4 and therefore merit inclusion in this Plan at this time. Projects that are not feasible (financially or technically) were not included in the project prioritization process but may be considered for future inclusion in IRMWP updates.

Figure 6-1: Project Selection Process

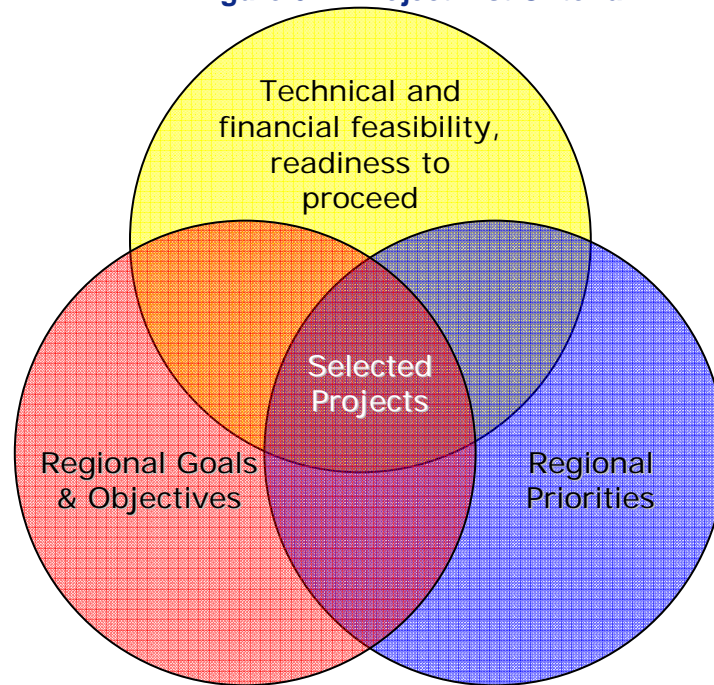


6.2.2 Project Assessment Process

Through collaboration with the Stakeholder Group and TAC, an inventory was compiled of projects that are at varying stages of planning or implementation. Projects were selected from this initial inventory based on:

- Ability to meet Regional priorities;
- Ability to meet Regional goals and objectives;
- Technical and financial feasibility; and
- Readiness to proceed.

Figure 6-2: Project List Criteria



By developing matrices between the projects and water management strategies, objectives, priorities, and feasibility (Section 5.2.1), it became apparent which strategies, priorities, objectives and goals were being addressed and to what degree a suite of projects could be considered “integrated” from a water resource perspective. Projects submitted by the Stakeholder group were assessed and ranked individually and the project package as a whole was assessed to determine the extent to which the package met the needs of the Region. Projects are listed in **Table 6-1**. **Table 6-2** shows the Regional and Statewide Priorities that each project helps meets.

Table 6-1: Project List

Project	Sponsor
Refine ASBS Alternatives	Monterey/PG
Lower Carmel River Restoration and Floodplain Enhancement	MCWRA/BSLT/MPWMD
Seaside Groundwater Basin Aquifer Storage and Recovery	MPWMD/CAW
Seaside Basin Groundwater Replenishment	MRWPCA
Seaside 90" Outfall Infiltration Component	City of Seaside
CSUMB Storm Water Percolation and Education	CSUMB
Carmel River Watershed Volunteer Monitoring Program	CRWC
Water Conservation Retrofit Program	MPWMD
Sanitary Sewer System Repair and Replacement in Monterey and PG	Monterey/PG
Microbial Source Tracking in the Cities of Monterey and Pacific Grove	Monterey/PG
Implementation of Solid Waste Removal Technology	Monterey/PG

Table 6-2: Matching Projects with Priorities

Project	Sponsor	Regional Priorities					Statewide Priorities					
		Priority	Meet current replacement supply and future demand targets for water supply. Support the Seaside Groundwater Basin Watermaster to implement the physical solution in the Basin.	Reduce the potential for flooding in Carmel Valley and at the Carmel River Lagoon	Address storm water discharges into ASBS	Promote the steelhead run	Mitigate effects of storm water runoff throughout the region	Reduce conflict between water users or resolve water rights disputes	Implementation of TMDL's that are established or under development	Implementation of the RWQCB Watershed Management Initiative Chapters, Plans, and Policies.	Implementation of SWRCB's NPS Pollution Plan	Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or species recovery plan
Refine ASBS Alternatives	Monterey/PG			✓		✓	✓	N/A	✓	✓	✓	TBD
Aquifer Storage and Recovery	MPWMD	✓			✓		✓	N/A	✓		✓	TBD
Seaside Basin Groundwater Replenishment	MRWPCA	✓			✓		✓	N/A	✓		✓	TBD
CSUMB Storm Water Percolation and Education	CSUMB					✓		N/A	✓	✓	✓	TBD
Carmel River Watershed Volunteer Monitoring Program	CRWC			✓	✓	✓	✓	N/A	✓	✓	✓	TBD
Lower Carmel River Restoration and Floodplain Enhancement	BSLT		✓		✓	✓		N/A	✓		✓	TBD
Seaside 90" Outfall Infiltration Component	Seaside	✓			✓	✓	✓	N/A	✓	✓	✓	TBD
Water Conservation Retrofit Program	MPWMD	✓			✓		✓	N/A	✓		✓	TBD
Sanitary Sewer System Repair and Replacement in the Cities of Monterey and Pacific Grove	Monterey/PG					✓		N/A	✓	✓	✓	TBD
Implementation of Solid Waste Removal Technology	Monterey/PG				✓			N/A	✓		✓	TBD
Microbial Source Tracking in the Cities of Monterey and Pacific Grove	Mont/PG/ Foundation							N/A	✓		✓	TBD

N/A – not applicable in the planning Region

TBD – to be determined in a future revision, if necessary

6.3 Project Prioritization

Prioritization of projects is a required element of an IRWM Plan and aids regional decision-making on issues such as project sequencing and quantitative allocations of limited financial, economic, social, and natural resources. Consistent with IRWMP standards, projects that utilize multiple water management strategies, meet Regional priorities, accomplish multiple objectives, and are feasible score higher and are more likely to move forward during implementation of the Plan.

This IRWM Plan incorporates a process to include a large number of stakeholder-sponsored projects with the potential for significant cost; however, given the scope and cost of some of the projects, it is unlikely that all projects can be fully funded by both local and State IRWM funds in the immediate future. Project sponsors may need to seek alternative funding sources in order to close funding gaps.

6.3.1 Scoring Metrics

The Stakeholder Group and TAC developed a system to compare and prioritize projects with vastly different characteristics. A 100-point system was used to evaluate the suite of selected projects, with each project evaluated both against other projects and on whether a project would meet measurable Regional objectives. Project characteristics that were deemed more important to the Region were allocated more points. Points were awarded in four different categories – water management strategies (as described in Chapter 4), objectives (as described in Chapter 5), Regional priorities (as described in the prior section), technical and financial feasibility, and readiness to proceed. The result is an evaluation that describes both the strengths and weaknesses of each project and the project package as a whole. The categories and distribution of points used in evaluating projects is shown in

Table 6-3: Scoring Criteria.

A score of 100 represents a project package that is 100% feasible and meets all the objectives for the region. Projects proposed for inclusion in this IRWMP are in varied stages of technical analysis and pre-design study. Their prioritization in this IRWMP reflects relative degrees of uncertainty regarding funding, the scope of work, readiness to proceed, and other factors affecting feasibility.

Table 6-3: Scoring Criteria

Category	Points	Basis for Scoring
Strategies	17	Projects receive pro-rata share
Objectives	25	Projects receive pro-rata share
Regional Priorities (33 points max)	8	Meet replacement and future demand water supply, manage SGB
	7	Reduce flooding in Carmel Valley
	6	Mitigate effects of storm water runoff throughout Region
	6	Address storm water discharges to ASBS
Statewide Priorities	6	Promote the steelhead run
	N/A	Qualitative evaluation of whether projects will help accomplish these priorities
Feasibility and Progress	7	Technical (proven technology or no obstacles)
	10	Financial
	8	Readiness to proceed (CEQA compliance, design, permits, etc.)
Total	100	Maximum a project package can score

Strategies (17%)

This category represents 17% (or 17 points) of the overall project package score. Each project is assigned a pro-rata share of the overall suite of projects based on the number of strategies used in comparison with other projects. For example, a project that employs six strategies receives twice as much as a project that employs three strategies. If all projects used the same number of strategies, all projects would receive an equal score in this category. There was no weighting applied to any particular strategy and the total number of points allocated to projects under this category is 17.

Objectives (25%)

This category represents 25% (or 25 points) of the overall project package score. Each project is assigned a pro-rata share of the overall suite of projects based on the number of objectives met in comparison with other projects. For example, a project that meets six objectives receives twice as much as a project that meets three objectives. If all projects met the same number of objectives, all projects would receive an equal score in this category. There was no weighting applied to any particular objective and the total number of points allocated to projects under this category is 25.

Regional Priorities (33%)

This category represents 33% (or 33 points) of the overall project package score. Scoring is not relative to other projects, but instead is based on how much a project contributes to meeting one or more Regional Priorities. Projects that align with regional priorities are given a preference. The Water Management Group also recognized that it was necessary to provide a system to award projects based on how well the project accomplished each priority. This category awards points specifically for that purpose.

Because Carmel River diversions and management of the Seaside Groundwater Basin (SGB) play such a crucial role in water management throughout the Region, this importance is emphasized by awarding additional points for projects that will help meet water supply targets including complying with SWRCB Order No. WR 95-10 and the Final Decision on adjudication in the SGB. For example, a project that can supply about 8,500 acre-feet of water annually (or one half the numeric goal set by stakeholders) would receive half of the points assigned to that priority (i.e., 8).

Because of the considerable presence of Areas of Special Biological Significance (ASBS) along the coast of Monterey Peninsula, it is important to encourage efforts that will protect these areas. Therefore, projects that reduce discharges to sensitive areas and, by doing so address provisions in the California Ocean Plan to eliminate point and non-point source pollution in ASBS, are given additional preference by being listed as a Regional Priority.

Similarly, flood reduction, promotion of the steelhead run, and mitigating storm water runoff throughout the Region are given additional preference.

Statewide Priorities – Qualitative Evaluation

Currently, the IRWM program guidelines do not award a preference to projects that help meet Statewide Priorities. However, these are important considerations in developing an IRWM Plan. The Regional Priorities in this plan reflect several Statewide Priorities; however, no measurable performance standards are available to determine the extent to which a local project or project package contributes toward meeting a Statewide Priority.

Feasibility and Progress (25%)

This category represents 25% (or 25 points) of the overall project package score. Each project is assigned a pro-rata share of the overall suite of projects based on the number of points scored in this category in comparison with other projects. This category promotes projects that have been proven to be technically

and financially feasible and have shown reasonable progress through the planning stage. As a project progresses, its feasibility usually becomes more apparent—therefore the two are closely coupled.

Technical feasibility was determined from pilot tests, engineering reports, or previous reports indicating technical competence. Technical feasibility was rated from zero for obstacles or unknown technology to seven for proven technology or methods. For engineered solutions, this means using an application or technology that is generally accepted or used. For biological or habitat related projects, this means using methods that are generally known to be valid for similar conditions.

Financial feasibility for each project was rated on a sliding scale of 0 to 10 (see Appendix E). Projects received a score of zero if no cost estimate and local funding match was identified. A project with no local match was considered not feasible. One exception was the Carmel River Watershed Volunteer Monitoring Program, which was identified as a project that would meet IRWM monitoring requirements. A sliding scale was used that awarded a higher score to lower cost projects and projects with a high percentage of the project cost being funded with a local match. Both conditions were presumed to increase the financial feasibility of an individual project.

Progress was assessed based on the level of planning, permitting advancement, and implementation progress relative to the final product or goal. Some projects may have shown progress, but have identified significant obstacles in their current form. For such a case, a project may be awarded zero points for feasibility, but may still receive progress points. Many of the projects outlined in this Plan are at a preliminary stage that will require engineering reports or initial environmental review in order to determine feasibility. These projects may be awarded zero feasibility points and zero progress points.

Table 6-4: Feasibility Criteria

Technical Feasibility	0 Points	Significant obstacles exist have been identified, or feasibility is undetermined.
	7 Points	The project has been proven feasible.
Financial Feasibility	0 Points	The project is not financially feasible.
	10 Points	Sliding scale based on local match % and total project cost (see Appendix E).
Progress	0 Points	Project is in initial planning stage.
	7 Points	Project is ready to be implemented.

6.3.2 Results of Project Prioritization

The results of the prioritization process are summarized in **Table 6-5: Detailed Prioritization Scores**. Implementation of the current suite of projects would achieve more than 70% of the goals and objectives set by the Stakeholder Group. It is clear that projects with multiple goals and objectives that help achieve Regional Priorities score the highest. It should be noted that the overall project package score and individual project ranking may change as projects progress in planning and design and cost estimates are refined or as individual projects are added to the suite of projects.

Table 6-5: Detailed Prioritization Scores

Project	Sponsor	Strategies	Objectives	Regional Priorities	Feasibility	Total	Ranking
Lower Carmel River Restoration and Floodplain Enhancement	MCWRA/BSLT /MPWMD	2.36	3.26	5.99	0.75	12.36	1
Refine ASBS Alternatives	Monterey/PG	2.83	3.44	3.99	2.04	12.30	2
Water Conservation Retrofit Program	MPWMD/CAW	1.89	2.36	1.58	1.63	7.45	3
CSUMB Stormwater Percolation and Education	CSUMB	2.13	2.90	1.09	1.21	7.33	4
Seaside 90" Outfall Infiltration Component	City of Seaside	2.36	2.72	1.29	0.65	7.03	5
Seaside Basin Groundwater Replenishment	MRWPCA	1.65	2.72	2.05	0.56	6.98	6
Carmel River Watershed Volunteer Monitoring Program	CRWC	1.42	2.72	1.09	1.21	6.44	7
Sanitary Sewer System Repair and Replacement	Monterey/PG	0.94	2.36	0.64	1.59	5.53	8
Microbial Source Tracking	Monterey/PG	0.71	1.27	0.00	2.06	4.03	9
Implementation of Solid Waste Removal Technology	Monterey/PG	0.71	1.27	0.00	1.75	3.72	10
Seaside Groundwater Basin Aquifer Storage and Recovery (not rated at this time)	MPWMD/CAW						N/A
Total Points, All Projects		17.0	25.0	17.7	13.4	73.2	
Maximum Possible Points for All Projects		17.0	25.0	33.0	25.0	100.0	

6.4 Process for Modifying Priorities

The priorities outlined in this IRWMP are based on the needs of the Region at the time the Plan was written. The Water Management Group and Stakeholder Group recognize that the Region's physical, political, and regulatory environment changes. It is therefore necessary to incorporate a systematic approach to managing priorities as the plan is implemented.

6.4.1 Modifying Regional Priorities

The same criteria that were used to define the initial set of priorities, as outlined in Section 6.1.1, will be used to modify regional priorities for future plan revisions. The Water Management Group and Stakeholder Group have defined the criteria in this way to allow for flexibility while preserving the integrity of priority selection and providing the necessary adaptive management technique to ensure the Plan's long-term viability.

6.4.2 Modifying Project Prioritization

As described in the MOU to form a Water Management Group, the IRWMP and project prioritization table may be modified from time based on requests from project sponsors and on changed conditions.

The Water Management Group, in cooperation with the Monterey Bay National Marine Sanctuary (MBNMS), will monitor projects and overall Plan performance. MPWMD will be the lead agency for facilitating information exchange among the Stakeholder Group and the MBNMS. All projects included in this Plan incorporate monitoring components. The Water Management Group will use the information collected by these efforts to assess changing conditions throughout the Region and will modify priorities when necessary.

If a priority change necessitates a change in project sequencing, then the Water Management Group will consider the effects on other projects. The projects identified in this IRWMP are interrelated and the benefits that they provide to the Region complement and build upon each other to the benefit of the whole Region. However, they are, for the most part, independent projects that do not depend on each other for successful implementation.

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Chapter 7 Implementation

IRWM Standard G

This section identifies specific actions, projects, and studies, by which the Plan will be implemented. Included in this section is identification of:

- the agency responsible for project implementation,
- linkages or interdependence between projects,
- financial and technical feasibility on a programmatic level,
- the current status of each element of the Plan,
- timelines for all active or planned projects, and
- the institutional structure that will ensure Plan implementation.

This section describes how the projects and programs selected in Chapter 6 will be implemented. As part of the IRWM planning processes, the Water Management Group entered into a memorandum of understanding (MOU) that defined the roles of these entities during Plan implementation. This MOU also outlined a process by which IRWMP stakeholders will communicate on implementation progress and will coordinate necessary changes. The MOU outlines a schedule for regular meetings to assess plan performance and facilitate the adaptive management techniques discussed in Section 7.3.

7.1 Projects and Programs for IRWMP Implementation

Ten projects were identified for implementation under this IRWMP. These projects meet all of the goals and priorities of the IRWMP in addition to addressing applicable statewide priorities. The projects are presented in this section along with tables that show the following information for each project:

- Responsible Agency
- Brief Project Description
- Current Status of Project
- Linkages/Interdependencies with other Projects
- Financial Feasibility
- Technical Feasibility
- Project Timeline
- Institutional Structure to Ensure Plan Implementation

It should be noted that the Seaside Groundwater Basin Aquifer Storage and Recovery Project is described in this section of the IRWMP, but it is not currently proposed to be included in the prioritized suite of projects. The ASR Project is still in the earliest planning stage so a cost estimate and funding source for a local match have not yet been determined. The methodology approved by stakeholders for evaluating the financial feasibility of proposed projects in the IRWMP includes a requirement that a cost estimate and local match be identified. Projects that do not fulfill this requirement are not eligible to be prioritized, but can be described and included in the IRWMP. When more is known about the scope, cost, and timing of the ASR Project expansion, MPWMD staff will request through the Water Management Group that the project be scored and ranked and considered for inclusion as a priority in the suite of proposed IRWMP projects.

7.1.1 Seaside Groundwater Basin Aquifer Storage and Recovery (ASR) Project Expansion

Brief Project Description:

The Monterey Peninsula Water Management District (MPWMD) manages and regulates the use, reuse, reclamation, and conservation of water within its boundaries. MPWMD conserves and augments water supplies by the integrated management of ground and surface water resources. About 80% of water within the MPWMD boundaries is produced and distributed by California American Water (Cal-Am or CAW), which serves about 95% of Monterey Peninsula area residents and businesses. Over 70% of the water delivered by Cal-Am is diverted from the Carmel River Basin. Cal-Am owns two dams and a series of wells along the Carmel River. For many years it has been recognized that the current level of pumping from the Carmel River Basin has adverse effects on lower Carmel River natural resources, particularly in dry years. Cal-Am, MPWMD and the State have sought alternative water sources and alternative water management actions so that dry season pumping could be reduced in the lower river and natural habitats could recover.

In 1995, the State Water Resources Control Board (SWRCB) ordered CAW to reduce its pumping in the Carmel River Basin (CRB) to a level in accordance with its water rights to reduce impacts on public trust resources. In addition to regulating diversions in the CRB, Cal-Am was also ordered to maximize pumping in the Seaside Groundwater Basin (SGB, Seaside Basin), to the extent feasible. MPWMD has carried out extensive groundwater monitoring in the SGB since 1988, and in a 2005 report to MPWMD on the condition of the SGB, it was determined that the Seaside Basin was in overdraft, which threatens its long-term reliability as a local source of domestic water supply (Yates et al, 2005). The basin was adjudicated in 2006 and the court imposed a physical solution that established the basin's annual natural safe yield, created a Watermaster to manage the resource, and requires eventual cutbacks in production or replacement of water that is extracted above the natural safe yield.

Aquifer Storage and Recovery (ASR) has been shown by MPWMD to be a viable method to store water in the SGB for future use in the Cal-Am system. ASR entails diverting excess winter flows from the Carmel River Basin during high flow periods using existing CAW wells in the lower stretches of the river. Diverted water is treated to potable drinking water standards and pumped approximately six miles through the CAW distribution system to the hydrologically separate Seaside Basin, where the water is injected into specially-constructed ASR wells for later recovery during dry periods. MPWMD has operated a full-scale ASR test well (Santa Margarita Test Injection Well No. 1) since 2002 and views this technique as one way to improve water management capabilities to the benefit of Carmel River natural resources and Seaside Groundwater Basin long-term reliability.

Construction of the first phase of the ASR Project, which will divert up to 2,426 AF annually between December 1 and the following May 31, began in late 2006 with completion of all facilities scheduled for early 2008. Existing infrastructure allows transport of up to approximately 800 AFA to the existing Santa Margarita well site for injection. A second injection/extraction well will be constructed adjacent to the Santa Margarita well site, allowing for injection and extraction of water at approximately 800 feet below the ground surface in the Santa Margarita Sandstone aquifer. These two wells will allow for injection of Carmel River system water during wet periods and extraction of water for use by CAW customers during dry periods. Infrastructure improvements are planned that will allow transport of up to 2,426 AFA to the existing Santa Margarita well site for injection. These improvements are scheduled for completion in late 2007. Maximum extraction would be approximately 1,500 AFA under the plan of operations.

Expansion of the ASR project would provide for a greater diversion of water from the Carmel River during high flows for transport and injection into the SGB. Detailed planning and description of the expanded facilities have not been completed. Based on preliminary plans, the Phase 1 ASR facilities potentially could be augmented with:

- a second dual-well site (four ASR wells total);
- a new 400 horsepower (hp) pump at the existing CAW Del Rey Oaks regulating station; and
- a new dedicated transmission pipeline (18- to 24-inch diameter) constructed along General Jim Moore Boulevard to the new well site.

This phase would maximize utilization of “excess” capacity in existing CAW Carmel Valley diversion, treatment, and conveyance facilities to the Seaside/Del Rey Oaks area. Up to 3,235 AF would be diverted annually and injected into the Santa Margarita Sandstone aquifer in the SGB to serve the same purposes as Phase 1 facilities. Maximum extraction would be approximately 4,057 AFA. A separate project-level EIR will be required to complete the ASR Project Expansion.

Planned diversions from the Carmel River would occur December through May at 8.91 cfs (4,000 gpm) maximum diversion rate, 3,235 acre-feet maximum diversion volume, which assumes a 183-day season and use of existing CAW production well capacity in the Carmel Valley alluvial aquifer, consistent with instream flow requirements recommended by NOAA Fisheries.

Transport of water from Carmel River to Seaside Groundwater Basin – Water would be produced from existing CAW production wells, transported via existing raw water line to the existing Begonia Iron Removal Plant (BIRP), then routed through the existing Segunda pipeline to the Seaside portion of the CAW distribution network. This project would utilize existing BIRP treatment capacity, the existing Segunda pipeline, pumps, and tank facilities (no additional Carmel Valley facilities planned). In Seaside, the project would utilize the existing Phase 1 ASR site (plus additional planned facilities, see below).

Additional facilities in Del Rey Oaks/Seaside (1,500 gpm additional capacity needed):

- a. Del Rey Oaks Booster Pump (400 hp).
- b. Dedicated transmission pipeline (18- to 24-inch diameter) along General Jim Moore Boulevard.
- c. One additional dual ASR well site (total of two ASR well sites; existing Phase 1 site plus the additional site [ASR Project Expansion]; see below).

Location, construction and operation of new wells

1. Location and size – The new dual-well site is to be located approximately 3,000 feet or more from the existing Phase 1 site. Each of the two new wells will have at least a 22-inch well casing diameter, with 1,500 gpm injection/3,000 gpm extraction capacity. The additional site injection capacity of 3,000 gpm is with both wells operating in injection mode; site estimated maximum extraction rate of 3,000 gpm is with only one well at a time operating in extraction mode.
2. Depth and intended storage aquifer – Each new well will have a depth of approximately 950 feet, with the Santa Margarita Sandstone as the target injection and extraction aquifer.
3. Proposed operations at the well sites
 - a. Intended period and rate of injection – December through May (maximum 183 days); 4,000 gpm combined injection goal for existing Phase 1 and additional new ASR sites. Estimated maximum injection for a 183-day period is 3,235 AF.

- b. Intended period and rate of extraction – July through November (153 days) intended extraction period; estimated maximum extraction rate of 3,000 gpm per site for a total of 6,000 gpm for both Phase 1 and additional new ASR sites, assuming only one well at a time in extraction mode at each dual-well site. Estimated maximum extraction for a 153-day period is 4,057 AF.

Impacts on Sensitive Species

The ASR Projects have the potential to affect special status aquatic species within the river corridor of the Carmel River, but will be designed to minimize any adverse impacts. Special status aquatic species that occur within the Carmel River are steelhead (*Oncorhynchus mykiss*), California red-legged frog (*Rana aurora draytonii*), California newt (*Triturus torosus*), western pond turtle, (*Clemmys marmorata*), and possibly the foothill yellow-legged frog (*Rana boylei*). Of these species steelhead and California red-legged frogs are listed as threatened under the Federal Endangered Species Act.

Potential benefits to steelhead and California red-legged frog include the reduction of groundwater pumping along the Carmel River in the dry summer months from the use of the Seaside Groundwater Basin for municipal supply. The net effect of these operational changes will potentially increase streamflow and improve environmental conditions along the Carmel River. Thus, the ASR Project would be beneficial to steelhead and the California red-legged frog.

Specific measures to restore or enhance special status species associated with the ASR Project

Specific measures to restore or enhance special status species associated with the ASR Project include replanting disturbed areas on the fringe of the project area with native vegetation, removing invasive exotic weeds, and creating wetland habitat areas using backflush water from wells.

Currently, the proposed project area is comprised of maritime chaparral including species such as bush monkey flower, black sage, and Monterey *ceanothus*. After construction activities are completed, these plants could be used to restore areas where heavy equipment and construction material were stored. Old access routes or vehicle turn outs that are no longer essential for maintenance access could also be revegetated with natives. The revegetation of the ASR project site could also include removal of invasive non-native species such as ice plant, which is currently at the site.

In addition to revegetation, there is potential to create wetlands or riparian type areas using back flush water from ASR wells. Currently the Santa Margarita Test Injection Well No. 1 has a back flow pit. MPWMD has noted interesting trends in this back flush pit such as recruitment of red willows (*Salix laevigata*) and an increase of bird species. With additional ASR wells coming on line, we believe the back flush pits can be designed and contoured to mimic natural vernal pool areas in Fort Ord, but on a smaller scale.

Preliminary backflush data from Water Year 2006 show an average of 0.93 acre-feet (AF) of water released to the pit area per test. Injection seasons may include up to 10 tests. These areas could serve as temporary hydration for many species of special concern. Similar beneficial measures may be carried out with the Phase 2 ASR Project.

Seaside Groundwater Basin Aquifer Storage and Recovery (ASR) Project Expansion

Responsible Agency: Monterey Peninsula Water Management District (MPWMD)

Current Status of Project:



Construction of the first phase of this project began in late 2006 and is expected to be complete in early 2008. The ASR Project Expansion is in the planning stage.

MPWMD has petitioned the SWRCB for use of the Seaside Groundwater Basin (SGB) as a place of storage for diversions from the Carmel River. Approval of these petitions would provide a water source for the ASR project. The SWRCB will use the information in the planned EIR to help determine whether the petition should be granted.

Linkages/Interdependencies with Other Projects:

This is one four projects proposed in the SGB to improve water quality in the basin aquifers, create a sustainable water supply for the Region, and reduce dependence on the Carmel River Basin. The resulting improvement of water resource management in the Carmel River Basin, especially during dry periods, will reduce impacts to riparian vegetation and aquatic habitats and threatened species in the area. See also the Seaside 90-Inch Outfall Infiltration Component, Seaside Basin Groundwater Replenishment Project and Refine ASBS Alternatives.

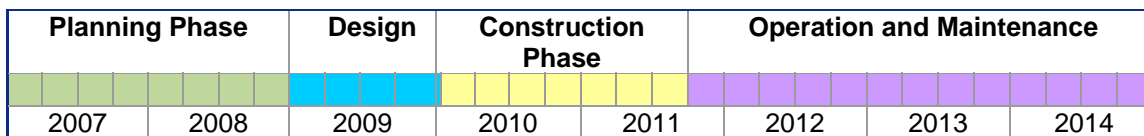
Financial Feasibility:

The estimated cost of this project is under development. MPWMD may fund local matching costs from user fees and property taxes. Requested State funding is to be determined.

Technical Feasibility:

MPWMD has evaluated the feasibility of an ASR project. Efforts have included hydrogeologic testing and construction of pilot and full-scale test ASR wells in the coastal area of the Seaside Basin. This testing has found that the basin can successfully be used to store water for future use in the Cal-Am system.

Project Timeline:



Institutional Structure to Ensure Implementation:

The MPWMD and California American Water will be responsible for project implementation.

7.1.2 Seaside Basin Groundwater Replenishment Project (GRP)

Brief Project Description:

The proposed Seaside Basin Groundwater Replenishment Project (GRP) involves the purification and conveyance of recycled water from MRWPCA's Salinas Valley Reclamation Plant (SVRP) for recharge of the Seaside Basin. Recycled water has been produced by the SVRP since 1998. That water has been delivered to 12,000 acres of farmland in the Castroville region of the lower Salinas Valley where numerous non-processed food crops such as lettuce, broccoli, cauliflower, celery, artichokes, and strawberries are grown. This same reclamation plant could produce additional water, which would be treated to drinking water quality and either percolated or injected into the Seaside Groundwater Basin to help recharge that basin.

Recycled water for the GRP would be delivered to the replenishment site through a recycled water trunkline that will be constructed under the Regional Urban Recycled Water Distribution Project (RURWP). The RURWP is described in the Salinas Valley IRWM Plan and is one of the projects that could be included in a Prop. 50 Second Round Implementation Grant application. In addition to providing irrigation water to numerous golf courses, parks, and landscaped areas in the Marina, Fort Ord, Seaside, Del Rey Oaks, and Monterey areas, the RURWP will also be able to deliver recycled water for the GRP.

Seaside Groundwater Replenishment Project (GRP)

Responsible Agency: Monterey Regional Water Pollution Control Agency (MRWPCA)

Current Status of Project:



The GRP is in the planning stage. An initial feasibility study was completed in September, 2004. Follow-up work is in progress involving coordination with other agencies, analyzing available hydrogeologic data for the proposed recharge sites, identification of environmental, permitting, and approval issues, development of criteria and parameters for a pilot-scale recharge facility, and preparation of a design report.

Linkages/Interdependencies with Other Projects:

This is one four projects proposed in the Seaside Groundwater Basin (SGB) to improve water quality in the basin aquifers, create a sustainable water supply for the Region, and reduce dependence on the Carmel River Basin. Working together, the resulting improvement of water resource management in the Carmel River Basin, especially during dry periods, will reduce impacts to riparian vegetation and aquatic habitats and threatened species in the area. See also ASR Project Expansion, Seaside 90-Inch Outfall Infiltration Component, and Refine ASBS Alternatives.

The GRP and the Regional Urban Recycled Water Distribution Project (RURWP) would work together to expand water recycling in this area. The GRP is also linked to proposed projects in Monterey and Pacific Grove to cease dry and wet weather discharges to ASBS.

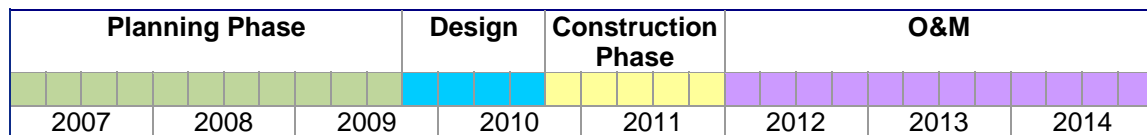
Financial Feasibility:

A 10% local cost match for this project will be comprised of staff labor and local capitol funding contributions from either cash reserves or debt-financing. The budget for Round 1 Implementation grant funding was \$2.2 million dollars.

Technical Feasibility:

An initial feasibility study has been completed in September, 2004 for using recycled water to recharge the Seaside Groundwater Basin. This study, and similar projects, have concluded the feasibility of GRP goals. Further pilot testing and extensive public outreach programs are highly recommended.

Project Timeline:



Institutional Structure to Ensure Implementation:

MRWPCA is responsible for project implementation.

7.1.3 Carmel River Watershed Water Quality Volunteer Monitoring Program (CRVMP or VMP)

Brief Project Description:

The Carmel River Volunteer Monitoring Program project will engage the surrounding community in the stewardship of the Carmel River and ocean through participation in various watershed and water quality monitoring programs which will inform them of the environmental conditions, wildlife species of concern, human impacts on water quality and habitat, and how each household can be a part of the solution for the Carmel River and surrounding nearshore areas.

The CRVMP will provide opportunities for individuals to monitor water quality, discharge (flow) and habitat conditions of the Carmel River environs. The VMP will also provide programs which will monitor dry season urban discharges and stormwater “flushing events” in the storm drains of the urban and developed areas along the river and the Monterey Peninsula waters, as well as participate in community and in-school outreach events.

Technical Design

The CRVMP will design and implement a comprehensive three-year watershed monitoring program. This program will include the development of a Monitoring Plan which will identify the program goals and objectives, provide monitoring methods, locations where monitoring will occur, and determine appropriate program parameters and targets. A *Quality Assurance Program Plan* (QAPP) will be developed for all water quality monitoring, and either a Science Advisory Committee (SAC) or a Technical Advisory Committee (TAC) will be established to inform and advise the program. The QAPP will be coordinated with the Surface Water Ambient Monitoring Program²⁸ (SWAMP) carried out by the State Water Resources Control Board.

The CRVMP will integrate existing information wherever possible to develop specific technical tools for water quality monitoring including the characterization of the watershed that addresses unique elements of the Carmel River, its tributaries and watershed; and establishment of a design for ambient water quality monitoring that also supports trend monitoring data assessments. Where appropriate the CRVMP will also engage in watershed monitoring such as flow and habitat conditions.

A data management program will be developed for the CRVMP program and appropriate databases will be established to store data collected in the program and integrate existing monitoring data. The data from this program will be integrated into the Coordinated Monitoring Program for the Monterey Peninsula IRWMP, and will be accessible to project partners, and scalable for use beyond the grant period to evaluate water resources management and health. All monitoring and the related databases will be compliant with the state’s Central Coast Ambient Monitoring Program (CCAMP) and the SWAMP. The CRVMP program will also seek to identify implementation funding and ongoing program operating support to continue the program beyond the IRWMP implementation period.

Additionally, the program will develop a community outreach and education program to communicate the program’s stewardship message and communicate the data collected to the residents and stakeholders in the IRWMP program area. This program could include but not be limited to any of the following

²⁸ SWAMP is a statewide monitoring effort designed to assess the conditions of surface waters throughout the state of California. The program is administered by the State Water Resources Control Board. Responsibility for implementation of monitoring activities resides with the nine Regional Water Quality Control Boards that have jurisdiction over their specific geographical areas of the state. Monitoring is conducted in SWAMP through the Department of Fish and Game and U.S. Geological Survey master contracts and local Regional Boards monitoring contracts.

elements: Community Information/Education workshops; attendance and presentations at community events and festivals; ‘Walk-and-Talk’ neighborhood level events; attendance and presentations in local schools; attendance and presentations at public forums; radio/television PSAs; marketing materials and brochures for the stewardship of the watershed resources within the area; and volunteer appreciation events & gifts.

Program Design

The VMP will operate the following programs and participate in the following regional events in appropriate areas covered in the Monterey Peninsula IRWMP planning area. Each of the following programs/events are well established by the VMP program partners, and already operate under state approved Monitoring Plans and QAPPs in other areas around the Monterey Bay. Annual and end of project data reports will be generated, reviewed by advisory body, and interpreted for public consumption. These will be coordinated with the larger IRWMP implementation effort.

The Clean Streams (CS) volunteer monitoring program focuses on watershed health for wildlife species and human health. Major components of this program are water quality monitoring for aquatic species, discharge (flow), and habitat monitoring (such as benthic-macroinvertebrate surveys and other accepted wildlife monitoring protocols). Additionally, bacteria sampling will be incorporated to address information gaps for source monitoring associated with stream and beach closures for human health issues. This program is appropriate for stream environments where surface runoff and groundwater lifted from natural sources is the dominant source of water, and wildlife habitat is the primary concern for information. In the Carmel River system, the inclusion of flow monitoring will inform the program partners of flow regimes in the watershed.

The goals of the Clean Streams monitoring program are:

- To provide baseline data where watershed information and water quality data are lacking or absent.
- To support and inform ongoing watershed assessments and enhancement plan development and ultimately provide effective monitoring for projects resulting from the assessment and enhancement plans.
- To support and inform ongoing watershed restoration action strategies.
- To support and inform local and state decision making around central coast watersheds by providing reliable water quality and habitat data.
- To develop and support stakeholder involvement in watershed initiatives and foster long-term watershed stewardship thru the involvement of local community members in watershed programs.

The Urban Watch (UW) program focuses on untreated urban surface water discharges flowing to streams or the ocean environments, specifically the Monterey Bay National Marine Sanctuary (MBNMS) and various Marine Protected Areas (MPA) in the region. Volunteers monitor storm drain outfalls during the dry season for common urban pollutants like detergent, chlorine and ammonia-nitrogen. The program runs from June through the first significant rain - in which the program culminates with an event called “First Flush” (see First Flush event). Additionally bacteria or other target parameters may be incorporated to address information gaps for source monitoring associated with stream and beach closures for human health issues. If additional source tracking monitoring is identified for inclusion in the program, it will be conducted by VMP project leads and jurisdictional Public Works staff. This program is appropriate for urban environments where surface runoff and groundwater lifted from urban use sources is the dominant source of water, and Nonpoint Source Pollution (NSP) contributions are the primary concern for information.

The goals of the Urban Watch monitoring program are:

- To provide baseline data where NSP information and water quality data are lacking or absent.
- To support and inform ongoing watershed assessments, NPDES, NSP, TMDL and Stormwater Plan development and processes, and ultimately provide effective monitoring for projects resulting from these ongoing efforts.
- To support and inform ongoing NSP Best Management Practice (BMP) implementation or other action strategies.
- To support and inform local and state decision making around central coast watersheds by providing reliable water quality and habitat data.
- To develop and support stakeholder involvement in watershed initiatives and foster long-term watershed stewardship thru the involvement of local community members in watershed programs.

The “*Taking-it-to-the-Streets*” outreach program focuses on watershed health for wildlife species and human health. Major components of this program are outreach events to develop watershed and NSP Prevention knowledge to the community and into the schools. This program is appropriate for all environments where community awareness is the primary concern for information. Volunteers would be provided opportunities to be a part of coordinated outreach events such as: Community Information/Education workshops; ‘Walk-and-Talk’ neighborhood level events; Attendance and presentations at Community events and festivals; Attendance and presentations in local schools; Attendance and presentations at public forums.

Regional Events

Inclusion of these events to the VMP assures regional coverage and coordination for the Monterey Peninsula watersheds and involves program participants from the VMP programs in the larger events, aiding in the recognition of the connection between what happens on land and its effects on the steam and ocean environments.

Snapshot Day (SSD) is a one-day event that utilizes volunteers to collect and analyze water samples from streams that enter the Monterey Bay National Marine Sanctuary (MBNMS). SSD began on Earth Day 2000 and has become a widely recognized volunteer event in which important water quality information is gathered. SSD is a partnership between The Monterey Bay Sanctuary Citizen Watershed Monitoring Network (Network) and the Coastal Watershed Council.

Volunteers monitor stream channels which drain to the Sanctuary on the first Saturday in May to develop a “snapshot” of water quality on that given day each spring. Volunteers monitor for the common watershed parameters (water temperature, pH, conductivity, dissolved oxygen, turbidity) and samples are collected and taken to a laboratory for analysis of pathogens and nutrients. This program is appropriate for stream environments where surface runoff and groundwater lifted from natural sources is the dominant source of water, and wildlife habitat is the primary concern for information.

First Flush (FF) is a single-day event that utilizes volunteers to collect and analyze water samples from storm drains that enter the streams or the Monterey Bay National Marine Sanctuary. The FF event began the fall of 2000 and has become a widely recognized volunteer event in which important water quality information is gathered. SSD is a partnership between The Monterey Bay Sanctuary Citizen Watershed Monitoring Network (Network) and the Coastal Watershed Council.

Volunteers monitor storm drain outfalls before, during, and after the first significant rain of the season, collecting samples to be analyzed for pathogens, nutrients, and metals, as well as collect field data at each site. By monitoring water quality from storm drains, this and the Urban Watch program provide valuable data for a source of water pollution that is not usually analyzed by traditional programs. This monitoring would be developing a core dataset that could establish trends, identify hot spots for follow up action, and establish a baseline to which future data can be compared against. Ultimately, these programs will

provide a feedback mechanism on current urban runoff control efforts and inform stormwater management programs in the IRWMP program area. This program is appropriate for urban environments where surface runoff and groundwater lifted from urban use sources is the dominant source of water, and wildlife Nonpoint Source Pollution contributions are the primary concern for information.

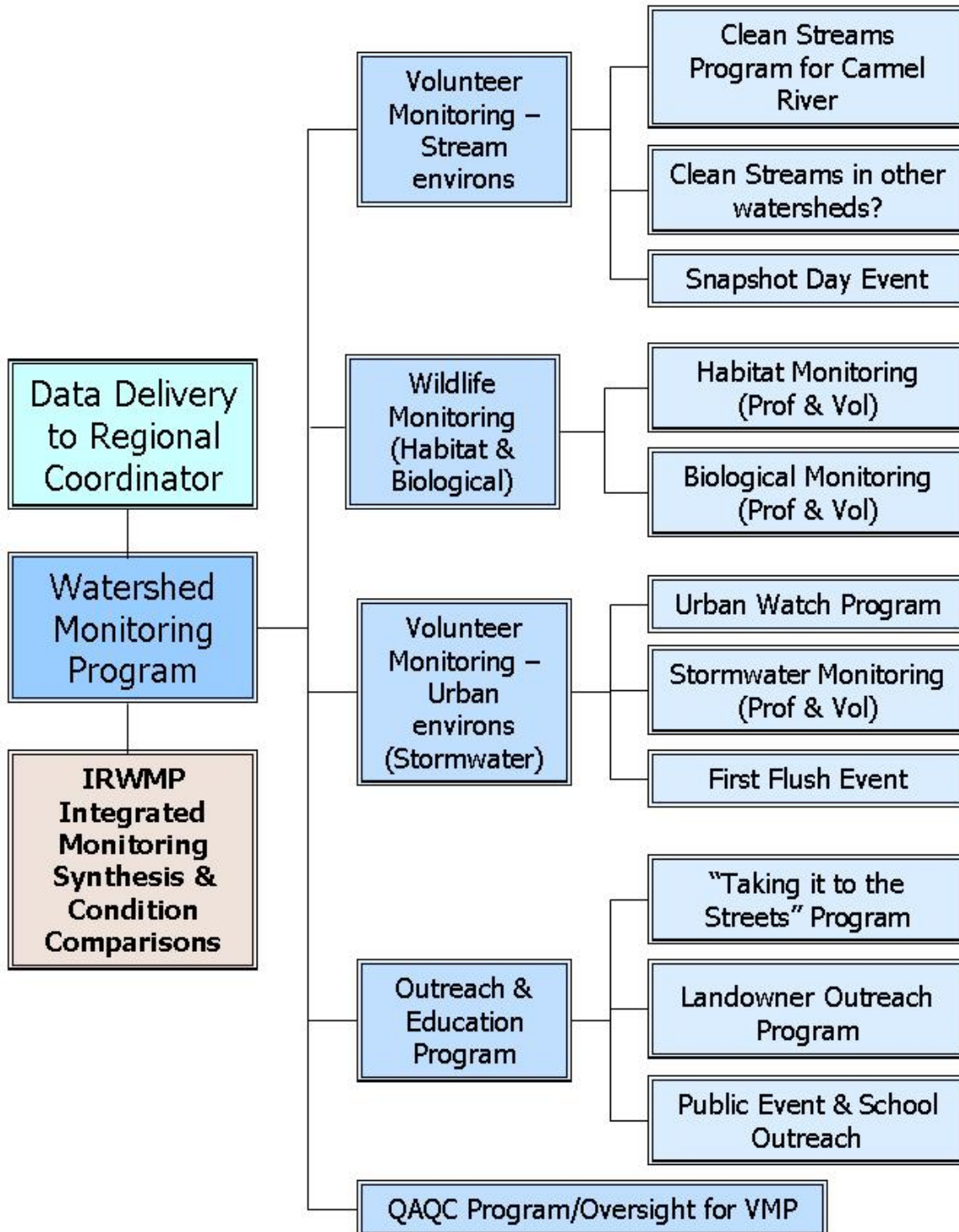
Program and financing strategy

The effectiveness of the VMP project will be evaluated over the long-term through the development of an ongoing monitoring plan with the goal of sustaining the VMP years into the foreseeable future. The plan will analyze and prioritize the project's monitoring programs as well as the effectiveness and ambient monitoring conducted as part of this project. The plan will also identify gaps and needs, including the amount of funding needed to implement the plan to completion. The project will develop proposals for submission to other funding sources deemed appropriate to maintain the core elements of the VMP in the Region. A schematic of the network of monitoring programs in the watershed is shown in **Figure 7-1: Carmel River Watershed Volunteer Program.**

Comprehensive Program Cost Estimate

\$750,000 for three years

Figure 7-1: Carmel River Watershed Volunteer Program



Carmel River Watershed Water Quality Volunteer Monitoring Program (CRVMP or VMP)																								
Responsible Agency: Carmel River Watershed Conservancy (CRWC)																								
Current Status of Project:																								
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Planning	Scope Development	Execution																						
<p>The CRWC <i>Carmel River Watershed Action Plan</i> identified the need for a Volunteer Monitoring Program in its January 2005 report to the SWRCB. The Carmel River Volunteer Monitoring Program project will engage the surrounding community in the stewardship of the Carmel River and ocean through participation in various watershed and water quality monitoring programs which will inform them of the environmental conditions, wildlife species of concern, human impacts on water quality and habitat, and how each household can be a part of the solution for the Carmel River and surrounding nearshore areas.</p> <p>The CRVMP will provide opportunities for individuals to monitor water quality, discharge (flow) and habitat conditions of the Carmel River environs. The VMP will also provide programs which will monitor dry season urban discharges and stormwater “flushing events” in the storm drains of the urban and developed areas along the river and the Monterey Peninsula waters, as well as participate in community and in-school outreach events.</p>																								
<p>Linkages/Interdependencies with Other Projects:</p> <p>Establishing an ambient water quality and flow monitoring program for the Carmel River and its tributaries as part of the IRWMP will provide critical data to evaluate impacts as well as other dynamic influences throughout the watershed that will occur during implementation of projects designed to improve water quality through reduction of non-point source pollution, improve fish passage, and restore aquatic habitats in the upper and lower watershed and river basin.</p> <p>A VMP would provide the necessary information for adaptive management techniques regarding restoration, mitigation, and protection of overall watershed health.</p>			<p>Financial Feasibility:</p> <p>The estimated cost is \$750,000 for a three-year program.</p>																					
			<p>Technical Feasibility:</p> <p>The VMP will in part be modeled on existing successful VMPs in the region (Monterey Bay National Marine Sanctuary and the Morro Bay National Estuary Program), and will also consider the experience of other programs in the state and nation to ensure successful implementation.</p>																					
Project Timeline:																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 16.6%;">Planning</th> <th style="width: 16.6%;">Develop VMP Plan</th> <th colspan="3" style="width: 50%;">TAC Reviews and Revisions</th> </tr> <tr> <td></td> <td></td> <th colspan="3" style="text-align: center;">Execute Monitoring</th> </tr> <tr> <td style="background-color: #92d050;"></td> <td style="background-color: #00b09b;"></td> <td style="background-color: #00b09b;"></td> <td style="background-color: #ffff00;"></td> <td style="background-color: #ffff00;"></td> </tr> <tr> <td style="text-align: center;">2007</td> <td style="text-align: center;">2008</td> <td style="text-align: center;">2009</td> <td style="text-align: center;">2010</td> <td style="text-align: center;">2011</td> </tr> </table>					Planning	Develop VMP Plan	TAC Reviews and Revisions					Execute Monitoring								2007	2008	2009	2010	2011
Planning	Develop VMP Plan	TAC Reviews and Revisions																						
		Execute Monitoring																						
2007	2008	2009	2010	2011																				
Institutional Structure to Ensure Implementation:																								
<p>The CRVMP will develop a stakeholder-based Technical Advisory Committee (TAC) that will include representatives of jurisdictional agencies, community groups and organizations, educational and research organizations, and individuals with interest in watershed management processes, wildlife protection, and beneficial uses for the community.</p>																								

7.1.4 Lower Carmel River and Lagoon Floodplain Restoration and Enhancement Project

Brief Project Description:

Carmel River Lagoon and Beach Studies - The Carmel River State Beach, which forms a seasonally brackish lagoon above sea level at the mouth of the Carmel River, is subject to frequent emergency actions to reduce the potential for flooding of nearby low-lying structures. These actions, which include mechanical breaching of the beach, result in an order of magnitude loss of aquatic habitat (from as much as 100 acres to as little as four acres after breaching) and undesirable consequences to fish and wildlife.

The Carmel River Lagoon Technical Advisory Committee has prepared a detailed scope of work that 1) sets out short- and long-term objectives for integrated management of the Beach and Lagoon in order to effectively resolve the competing interests noted above; and 2) describes the necessary technical studies to develop a long-term management program to protect habitat and infrastructure including sediment transport, biological and physical parameters of the ecosystem, hydrologic analyses, engineering analysis of bluff stabilization techniques, and economic analysis of alternatives to flood proof low-lying structures. The total estimated cost of these studies and investigations is approximately \$850,000 and is anticipated to take three years to complete (see Study Plan for Long Term Adaptive Management of the Carmel River State Beach and Lagoon, April 2007).

Lower Carmel River Floodplain Restoration and Enhancement – Increasing flood conveyance in the south overbank of the Carmel River upstream of Highway 1 has been considered since at least 1981 (see “Flood Hazard Mitigation Study for the Lower Carmel River,” George S. Nolte and Associates, July 1981). More recently, in August 2002, a set of structural and operational improvements was identified that could potentially reduce flood hazards in the Lower Carmel River and restore natural floodplain functions in an area upstream of Highway 1 that has been in agricultural production since the early 1900’s. Improvements include levee strengthening on the north side of the river, levee removal along the south side of the river, and increased conveyance at Highway 1 to link upstream flows to the newly restored south arm of the Carmel River Lagoon. Additional improvements may include installation of pumps to protect infrastructure on the north side of the river from local inflow that cannot enter the Carmel River during high flows. To fully implement flood control improvements in this area, approximately 500 feet of Highway 1 would be elevated with a causeway over the Carmel River floodplain.

County Services Area 50 (CSA-50) is a developed area located along the north side of the Lower Carmel River. Of the 147 acres of developed area in CSA-50, approximately 105 acres flood during the 50-year flood event and all 147 acres flood during the 100-year event. There are 69 Repetitive Loss Properties within the 100-year floodplain (two or more claims of \$1,000 or more paid by the National Flood Insurance Program within any given 10-year period, since 1978). The recommended structural improvements include adding pumping capacity, installing floodwalls, raising and extending levees, and grading on the south floodplain of the Carmel River. Recommended operations improvements include the preparation of operations and maintenance plans for pumping facilities and adaptive management of vegetation at strategic points along the south bank of the Carmel River.

In early 2007, a HEC-RAS analysis was conducted of several alternatives to reduce flood hazards in the lower river and restore natural overbank floodplain geometry on the south side of the river upstream of Highway 1. Hydraulic analysis showed that improved conveyance at Highway 1 is key to reducing the potential for flooding both up and downstream of the highway. Using existing information for the predicted 100-year flood, modeling results demonstrated a reduction in the 100-year flood elevation could be achieved and that areas along the northern bank could benefit from the lower potential for flooding. Initial hydraulic analysis was completed for \$50,000. Additional analyses in the fall of 2007 to refine

alternatives is estimated to cost \$35,000 (these funds have already been committed by CSA 50 and the Big Sur Land Trust). Additional design, engineering, and planning is anticipated to require \$350,000 in funding (these funds are being requested in the IRWM Plan).

The most beneficial set of projects involve increased flood conveyance on the southern floodplain at Highway 1 via a bridge or system of culverts, removal of the south levee, and restoration of approximately 55 acres of riparian habitat. The project would also include installation of a recreational trail along the boundary of Palo Corona Regional Park and the Odello Field.

Hacienda Carmel Flood Bypass

Hacienda Carmel is a retirement community (must be >55 years old) with approximately 300 units. It is situated entirely in the 100-year floodplain of the Carmel River and is protected by an earthen levee constructed in 1963. The levee has been shown to be highly unstable and prone to erosion during high flows. The Army Corps of Engineers estimated that this reach of the river has a capacity to pass only the 15-year flood safely. The current Flood Insurance Study for Carmel Valley shows that during an estimated 100-year flood, portions of Hacienda Carmel could be inundated by up to five feet of water.

The feasibility of incorporating a flood bypass on the south side of Hacienda Carmel would be re-evaluated as a part of this project. The concept of a bypass was proposed by MCWRA (under the Federal Emergency Management Agency Flood Hazard Mitigation Program) after repeated flooding in 1995 and 1998 necessitated emergency actions by the administration of Hacienda Carmel to evacuate residents and prevent total failure of the levee. The project did not move forward due to concerns by affected adjacent property owners over potential impacts. Since that time, one of the affected property owners (Rancho Cañada) has proposed a development project that may somewhat decrease flood elevations during a 100-year flood in the area downstream of Hacienda Carmel. The feasibility of a project that would combine a bypass with work for the Lower Carmel River Floodplain Restoration and improvements at Rancho Cañada would be studied. It is estimated that a hydraulic analysis and feasibility study of approximately 1.5 miles of the river would cost up to \$75,000.

7.1.4 Lower Carmel River and Lagoon Floodplain Restoration and Enhancement Project

Responsible Agency: Monterey County Water Resources Agency/Big Sur Land Trust/Monterey Peninsula Water Management District/County Services Area 50

Current Status of Project (Phase I)



Carmel River Lagoon: A set of studies was described in April 2007 to analyze and define the best approach to managing the lagoon and surrounding area for the benefit of wildlife and people.

Floodplain Restoration: Increasing conveyance in the south overbank of the Carmel River upstream of Highway 1 has been analyzed and discussed since at least 1981. More recently, a project report for floodplain restoration was completed in August of 2002 that identified improvements that could reduce the flooding potential in the Lower Carmel River area downstream of Rancho Cañada. In 2007, Balance Hydrologics performed HEC-RAS analysis showing that improvements in conveyance under Highway 1 would result in a substantial reduction of flood elevations in the vicinity and could restore natural river functions both up and downstream of Highway 1. The project is currently in the preliminary engineering stage that includes consideration of current and proposed revisions to Federal Emergency Management Agency (FEMA) floodplain mapping of the area.

Hacienda Carmel Bypass: The Army Corps of Engineers estimated that this reach of the river has a capacity to pass only the 15-year flood safely. A preliminary hydraulic analysis is proposed that would evaluate the feasibility of combining work described at the Carmel River Lagoon and for Floodplain Restoration with a bypass channel at Hacienda Carmel.

Environmental Compliance Documents: Due to the need for comprehensive (as opposed to piecemeal) planning in this area, it is estimated that the cost of work to comply with CEQA and NEPA is up to \$400,000.

Linkages/Interdependencies with Other Projects:

The project is multi-objective in nature and designed to be comprehensive. It will integrate a number of strategies that will provide flood protection, restore natural river functions, enhance streamside habitats of the Carmel River, provide trails for public recreation, and improve road safety during floods. The project is a significant step toward resolving long-standing issues and concerns in the Lower Carmel River.

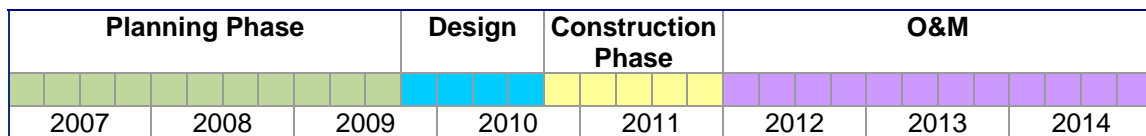
Financial Feasibility:

Studies for long-term management of the Carmel River lagoon are estimated at \$850,000. Additional design, engineering, and planning for floodplain restoration is anticipated to require \$350,000 in funding. Analysis of a Hacienda Carmel flood bypass is estimated at \$75,000. Preparation of environmental compliance documents (e.g., EIR) is estimated at \$400,000. Total funds requested equal \$1,675,000 (\$1.675 million). A local match of 10% of project costs is expected to be made with in-kind services (staff) and contribution of fund.

Technical Feasibility:

The project has received initial analysis that demonstrated a successful flood enhancement and habitat restoration project could be implemented. Land ownership patterns are such that key properties would be available for some of the planned improvements. Several entities and interests are working collectively to implement this broad vision. No technical hurdles are anticipated.

Project Timeline:



Institutional Structure to Ensure Implementation: A multi-agency implementation body will be explored for the project.

7.1.5 Sanitary Sewer System Repair and Replacement in Cities of Monterey and Pacific Grove

Brief Project Description:

This project will repair or replace gravity and force main sewer lines in the Cities of Monterey and Pacific Grove where moderate to severe deterioration has been observed and where failure is imminent. Old or damaged sewer lines can lead to discharges of untreated waste through exfiltration to adjacent soil and groundwater, or through sewage system overflows that result from catastrophic pipe failures or ruptures. In addition to being a threat to Areas of Special Biological Significance (ASBS) and the Monterey Bay National Marine Sanctuary (MBNMS), aging sanitary sewer infrastructure is a major contributing factor to local beach closures and postings.

Sanitary Sewer System Repair and Replacement in Cities of Monterey and Pacific Grove									
Responsible Agency: Cities of Monterey and Pacific Grove									
Current Status of Project:									
Planning		Permitting/Design			Construction			O&M	
<p>In May of 2004, the City of Pacific Grove accepted a Sewer System Asset Management Plan (SSAMP) prepared by HDR Engineering, Inc. The purpose of the SSAMP is to provide guidance to the City in the management of the City's sewer system asset. The SSAMP report details 7,616 feet of sewer pipe graded C, D, or F, requiring over \$1.4 million in repair costs (2004 dollars).</p> <p>In February of 2000, the City of Monterey completed a system study of the sanitary sewer system with televised recordings of all lines and "report card" rating of the pipe conditions. In August of 2001, a pre-design study was completed, taking all of the information from the initial study and putting together 22 rehabilitation projects for the pipes graded in the 'C', 'D', and 'F' categories.</p>									
Linkages/Interdependencies with Other Projects:					Financial Feasibility:				
<p>In conjunction with other NPS pollution prevention efforts included in the IRWMP, this project seeks to mitigate pollutant discharge to ASBS and the MBNMS.</p>					<p>Matching funds in the amount of \$940,750 have been identified. The total budget for this project is \$9,407,500.</p>				
					Technical Feasibility:				
					<p>In September 2002, the first sanitary sewer system upgrade was completed. The City has since completed project plans and specifications for an additional \$1.5 million in rehabilitation to the sanitary sewer system. These projects were completed successfully, and there are no additional technical issues anticipated for this project.</p>				
Project Timeline:									
Planning Phase			Design		Construction Phase		Operation and Maintenance		
2006	2007	2008	2009	2010	2011	2012	2013		
Institutional Structure to Ensure Implementation: The Cities of Monterey and Pacific Grove will be responsible for project implementation.									

7.1.6 Implementation of Solid Waste Removal Technology (from storm water)

Brief Project Description:

This project would curb solid waste emissions from two locations in the City of Monterey and two locations in the City of Pacific Grove. In Monterey, two sites have been chosen based on their large upstream drainage areas and their known propensity for being collection points for wayward pieces of trash. The Steinbeck Plaza/Prescott Avenue storm drain outfall in the City of Monterey and the Olivier Street/Scott Street Storm Drain are both locations that are adjacent to existing Urban Watch and First Flush monitoring locations. During the dry weather months, volunteers visit the outfalls just downstream of these sites weekly to take water samples and to observe outfall conditions. In the City of Pacific Grove, two existing storm drain diversion locations have been chosen due to the need for solids separation and removal prior to diverting urban runoff to the sanitary sewer system. These locations are ideal for this technology because solids clog diversion pumps causing failure of the system. The course of action would include the investigation of available solid waste separation technologies as well as the purchase and installation of four units.

Implementation of Solid Waste Removal Technology			
Responsible Agency: Cities of Monterey and Pacific Grove			
Current Status of Project:			
Planning	Permitting/Design	Construction	O&M
This project is ready to be implemented as soon as additional funds are made available.			
Linkages/Interdependencies with Other Projects:		Financial Feasibility:	
In conjunction with other NPS pollution prevention efforts included in the IRWMP, this project will implement technology that will directly curb NPS pollution into the MBNMS.		Matching funds in the amount of \$99,000 have been identified. The total budget for this project is \$990,000	
		Technical Feasibility:	
		No permitting problems are expected. The California Coastal Commission permit is the only permit that is needed. This is expected to be approved without controversy.	
Project Timeline:			
Planning	Permitting/Design	Construction	O&M
2006	2007	2008	2009
Institutional Structure to Ensure Implementation: The Cities of Monterey and Pacific Grove will be responsible for project implementation.			

7.1.7 Microbial Source Tracking in the Cities of Monterey and Pacific Grove

Brief Project Description:

This project will analyze water samples from the storm drain system for the source of bacteria, providing critical data for the management of bacterial contamination that leads to beach closures and postings in the Monterey Peninsula Region. Although much is known about anthropogenic sources of coliform, more diagnostic evaluation is needed to determine if a closure or a posting is caused by human or animal bacteria.

A first step in effectively addressing this issue is better identification and tracking of the sources to distinguish among wildlife, domestic animals and human contributors. The first component is, therefore, a comprehensive study using an analysis method such as ribosomal RNA typing to determine sources of coliform contamination in three watersheds that flow into the Monterey Bay National Marine Sanctuary (MBNMS). This will be a two-year project with the microbial source tracking study conducted over the first 12 month period. The second year will entail data analysis, completion of a report, and outreach and technical follow-up with the local jurisdictions to identify appropriate management measures.

The results of this study will provide the cities, County, Regional Water Quality Control Board, State Water Resources Control Board and the Sanctuary with the information they need to reduce the number of beach postings and determine the human health risk at these study locations and possibly other similar watersheds throughout the MBNMS.

Microbial Source Tracking in the Cities of Monterey and Pacific Grove	
Responsible Agency: Cities of Monterey and Pacific Grove	
Current Status of Project:	
<p>Extensive planning has already been conducted into how this program will be conducted including sampling regime, sampling entities, and testing procedures. This project is ready to be implemented as soon as funding is available.</p>	
<p>Linkages/Interdependencies with Other Projects:</p> <p>In conjunction with other NPS pollution prevention efforts included in the IRWMP, this project will provide information that will help develop future NPS pollution mitigation projects and programs.</p>	<p>Financial Feasibility:</p> <p>\$36,000 of in-kind services from NOAA and Monterey and Pacific Grove Urban Watch. The total budget for this project is \$252,000.</p> <p>Technical Feasibility:</p> <p>There are no technical issues anticipated for this project.</p>
<p>Project Timeline:</p> <p>Project will be executed immediately following receipt of funding. The expected project duration is 24 months.</p>	
<p>Institutional Structure to Ensure Implementation: The Cities of Monterey and Pacific Grove will be responsible for project implementation.</p>	

7.1.8 California State University Monterey Bay (CSUMB), Storm Water Percolation and Education Project

Brief Project Description:

Most of CSUMB west of 7th Avenue is located within two sub-watersheds that are currently served by the former Fort Ord regional storm drainage systems. Formerly, this storm drainage system discharged directly into Monterey Bay and currently discharges into percolation ponds located in environmentally sensitive areas between the ocean and Highway 1. A primary goal of the Fort Ord Reuse Authority (FORA) is encourage infiltration of stormwater runoff to eliminate reliance on the existing aging storm drain system.

The area of CSUMB located between 7th Avenue and 8th Avenue currently discharges its runoff through a local storm drain system to an open space area to the north that is considered to be environmentally sensitive. CSUMB is having a storm water master plan prepared to modify their storm drain system to have all storm water generated within their property be percolated on-site, thereby eliminating their contribution of runoff to the above mentioned environmentally sensitive areas. Although CSUMB has two storm water projects ready for implementation, they are only requesting funds for the implementation of the project B.

Project B involves a site (Site B) that is approximately 67 acres in size and includes about 6.5 acres upstream of CSUMB property that discharges storm water through CSUMB. Under existing conditions, about 80% of 67 acres is covered with asphalt. The 7th Avenue to 8th Avenue project (Site B) proposes to remove enough asphalt and hardscape to reduce the impervious area to about 40%. The existing drainage area will be divided into seven (7) subdrainage areas with a percolation pond on each site (refer to Figure 3). Bare soil areas will be seeded as described for Site A. The estimated cost for this project is \$3.5 million, including both CSUMB and off-site projects. Site B will require planting 32 acres previously covered with asphalt. The area is planned to be drill-seeded with native grasses The Watershed Institute's Return of the Natives (RON) program will grow and plant the percolation basin sides with native plants as a community based restoration project involving K-12 students coming to campus, CSUMB students, and the general public on weekends.

CSUMB Storm Water Percolation and Education Project

Responsible Agency: CSUMB, Foundation of CSUMB, and the Watershed Institute.

Current Status of Project:



Planning level engineering cost estimates have been developed and the project is ready for implementation as soon as funding is made available.

Linkages/Interdependencies with Other Projects:

In conjunction with other watershed management projects and NPS controls, storm water in the region can be effectively mitigated.

This project is one of three proposed projects to improve near-shore water quality in the Monterey Bay National Marine Sanctuary by reducing storm water discharges (see Refine ASBS Alternatives and Seaside 90-Inch Outfall Project).

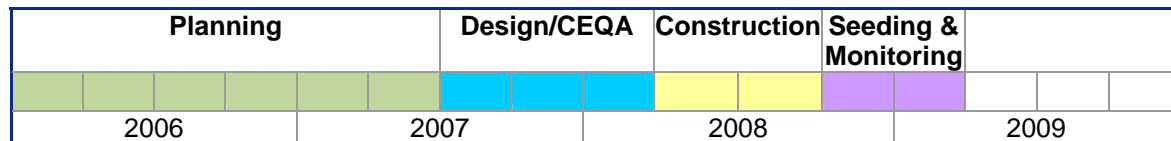
Financial Feasibility:

A 10% cost match will come from CSUMB Facilities budget, project management-in kind services, and state funds. Request funds for this project is \$3,526,000

Technical Feasibility:

The Monterey County Soil Survey identifies the soils in this area with soil permeability ranges from 6 inches to 20 inches per hour. The estimated 100-year 24-hour rainfall depth for the area within CSUMB's footprint is 6-inches, based on the Monterey County Department of Public Works Plate 25, Rainfall Intensities Chart. It can be shown that even under saturated conditions and given enough pervious area, all runoff generated within CSUMB may easily be percolated back into the ground within their property.

Project Timeline:



Institutional Structure to Ensure Implementation: CSUMB, Foundation of CSUMB, and the Watershed Institute.

7.1.9 Water Conservation Retrofit Program

Brief Project Description:

The Monterey Peninsula Water Management District (MPWMD) retained the services of RMC Water and Environment for the purpose of evaluating the findings of reports by other agencies regarding multiple water conservation retrofits/installations for commercial/industrial/institutional (CII) services. A Water Conservation Alternatives Evaluation was completed on October 25, 2006, which quantified the average cost to benefit ratio for various retrofits, in order to identify which retrofits could best be incorporated into a comprehensive CII Conservation Program. The evaluation was used to prioritize and identify retrofit programs that would offer maximum cost savings.

MPWMD has identified two (of eight) retrofit activities with the significant water savings over a 10-year period: weather-based irrigation controllers and high efficiency commercial clothes washers. The estimated overall costs vs. benefits for each of the evaluated options showed that these two retrofit activities were ranked in the top three program recommendations based on cost savings.

Additionally, the study results indicate that there are potential significant net reductions in water use from implementing these retrofit programs. The approximate cumulative water savings of the most favored option (weather-based irrigation controllers) is estimated at 12,975 acre-feet over 20 years, with a potential of approximately \$1.2 million in cumulative dollar savings. The approximate cumulative water savings of a High Efficiency Commercial Clothes Washer Program is estimated at 806 acre-feet over 20 years, with a potential of approximately \$670,000 in cumulative dollar savings.

MPWMD is proposing to implement the two highest water saving programs. A Weather-Based “Smart” Irrigation Controller Program and a High Efficiency Commercial Clothes Washer Program are identified as the programs with the greatest long-term benefit. The program would include a public awareness/education campaign, site evaluations, inspections and reporting, and other directly related work/expenses. These devices would be added to the existing Water Saving Appliance Rebate Program.

The total cost of the program is estimated at \$160,000. The local match by MPWMD would be \$80,000.

Water Conservation Retrofit Program

Responsible Agency: Monterey Peninsula Water Management District (MPWMD)

Current Status of Project:



This project is at the initial planning stage.

Linkages/Interdependencies with Other Projects:

This project is one of several projects aimed at reducing dependence on local water supplies extracted from the Carmel Valley and Seaside Groundwater Basin. This project will also help protect the community during drought years by reducing long-term water use. This project will work in conjunction with other projects to reduce impacts to sensitive species and restore the water balance in the Region.

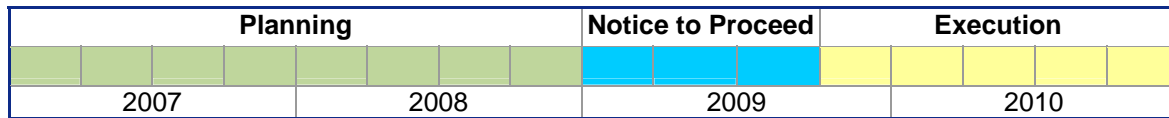
Financial Feasibility:

The estimated cost of implementing these projects is estimated at \$160,000. A joint water conservation effort of MPWMD and Cal Am Water Company, would be the most cost-effective approach to initial implementation of these two programs. MPWMD will fund a local match of \$80,000 from user fees. Requested State funding is \$80,000.

Technical Feasibility:

Currently, there are no foreseen technical or environmental hurdles to this project. This project would augment the existing MPWMD Conservation Program with proven technology for reducing water use.

Project Timeline:



Institutional Structure to Ensure Implementation: Monterey Peninsula Water Management District (MPWMD)

7.1.10 Seaside 90" Outfall Infiltration Component

Brief Project Description:

The Seaside 90 Inch Outfall Infiltration Component project will divert stormwater at various locations in the Cities of Seaside and Sand City to infiltration areas before it enters the 90-inch outfall pipeline at Bay Avenue in the City of Seaside. The outfall, located at the north end of the Seaside section of Monterey State Beach near the intersection of Bay Street and Sand Dunes Drive, is one of two points where the City of Seaside's stormwater system discharges into Monterey Bay. The 90 Inch Outfall collects water from an area made up of most of Seaside proper and Sand City, which is approximately 1425 acres in size.

The infiltration component is a part of a larger project to divert most dry-weather runoff from the 90 Inch Outfall to the sanitary sewer system using the existing Monterey Regional Water Pollution Control Agency (MRWPCA) pump station. After completion of the infiltration component, it is anticipated that a significant amount of wet-weather stormwater will be diverted, in addition to dry season flows. This proposed project is for infiltration only. There is a separate project for the diversion of stormwater to MRWPCA facilities associated with the 90" outfall.

The Seaside 90 Inch Outfall Infiltration Component project would most likely affect infiltration into both the Aromas Sand Aquifer and the Paso Robles Aquifer. It is estimated that 980 AF/year (for an average year) in stormwater flow might percolate into the aquifers from this project. This number was calculated using an average annual rainfall of 15 inches over an area of 1,425 acres, and assuming that 55% of the area is covered with impervious surfaces.

The project currently is in the early planning stages. This IRWMP project includes a feasibility analysis and system design. The scope of work includes analysis of the stormwater system in the Cities of Seaside and Sand City in order to locate potential infiltration areas, along with methods to intercept stormwater and transport it to these areas. It is expected the project will:

- reduce water quality impacts of urban runoff on the beach and in the Monterey Bay National Marine Sanctuary
- minimize the potential for intrusion of saltwater into the aquifers in the Seaside Groundwater Basin by enhancing the infiltration of storm water, which will recharge the aquifers and reduce effects of overdrafting that can lead to saltwater intrusion.
- reduce flooding in urban areas
- help assure water supply reliability by recharging the Seaside aquifer
- foster groundwater management: By recharging the Seaside Aquifer, this project will augment and support the aquifer and buffer against salt water intrusion.
- improve recreation and public access to beaches because it is expected that water quality in the Monterey Bay National Marine Sanctuary will be improved since less storm water will reach the bay. Since there will be fewer toxics going into Monterey Bay, there will be fewer beach closures.

The estimated cost for planning and design is \$735,000 with a construction cost of \$7.5 million for a total cost of \$8.235 million.

Seaside 90" Outfall Infiltration Component

Responsible Agency: City of Seaside

Current Status of Project:



Initial agency planning stage.

Linkages/Interdependencies with Other Projects:

This project complements three other projects proposed in the Seaside Groundwater Basin (SGB) to improve water quality in the basin aquifers, create a sustainable water supply for the Region, and reduce dependence on the Carmel River Basin (see Projects 7.1.1 and 7.1.2.). The resulting improvement of water resource management in the Carmel River Basin, especially during dry periods, will reduce impacts to riparian vegetation and aquatic habitats and threatened species in the area.

This project is also one of three proposed projects to improve near-shore water quality in the Monterey Bay National Marine Sanctuary by reducing storm water discharges (see also Project 7.1.8 and 7.1.11).

Seaside 90 Inch Outfall Infiltration Component Project will work with these related projects to:

- improve the quality of urban runoff
- minimize the intrusion of saltwater into the Seaside aquifer
- reduce flooding in urban areas
- help assure water supply reliability
- foster groundwater management
- improve recreation and public access to beaches

Financial Feasibility:

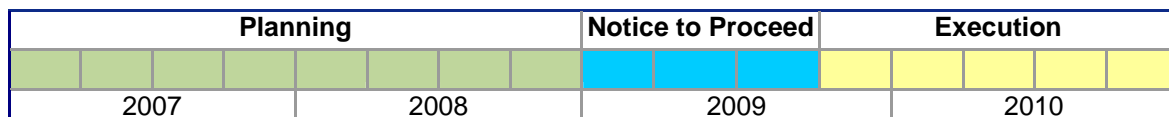
The cost estimate for this project is \$155,000 for planning, \$580,000 for design and \$7.5 million for construction. The total estimated cost is \$8.235 million. Sources of City of Seaside matching funds include the City's Redevelopment Fund, a potential new stormwater user fee and other grants.

Technical Feasibility:

This project will use proven technology (piping to draw storm water out of the storm drain system and into the Seaside Groundwater Basin).

Currently, there are no foreseen technical or environmental hurdles to this project. Subsequent engineering and biological assessments will provide more details regarding technical feasibility of future project implementations.

Project Timeline (funding dependent):



Institutional Structure to Ensure Implementation: City of Seaside

7.1.11 Refine ASBS Alternatives

Brief Project Description:

Preliminary results from the *Alternatives Analysis and Data Acquisition for the Pacific Grove and Carmel Bay Areas of Special Biological Significance* (preliminary feasibility study) are as follows. The proposed project would divert and treat urban water runoff from the Pacific Grove and Carmel Bay ASBSs. Under consideration is a system that would divert both dry-weather and most of the wet-weather flows to either on-site treatment or treatment at a Publicly Owned Treatment Works (POTW) facility. This project will help meet the regional water demand for water supply through reuse of dry weather flows as well as use of storm water. Urban water flows could be diverted to the sanitary sewer, to a reservoir, or to the groundwater for reuse. Diverted water can be incorporated into a conjunctive use scheme, such as the Seaside Groundwater Basin, to provide another source for groundwater recharge.

The proposed work is to define the most cost-effective option to divert and/or treat dry weather and wet weather flows from the Pacific Grove and Carmel Bay ASBSs. The preliminary feasibility study showed that a combination of on-site treatment of storm water and diversion of all dry-weather flows from the Pacific Grove and Carmel Bay ASBSs are viable options. Dry weather flows could be treated by media filtration and then diverted outside of the ASBSs, while wet weather flows would be treated and then may be discharged either into or outside of the ASBSs. The discharge of treated water into or outside of ASBSs may provide compliance with either the proposed Special Conditions for Areas of Special Biological Significance (SWRCB, 2006) or compliance with water reuse program guidelines. It is expected that the diverted water would be treated to below Ocean Plan and/or Basin Plan limits, respectively.

The proposed project would refine the feasibility study and prepare the CEQA documents to determine the most cost-effective option to divert and treat dry and wet weather flows from the Pacific Grove and Carmel Bay ASBSs. Based upon findings in the proposed feasibility study and regulatory requirements, either the preferred alternative would be implemented or the project would be refined.

Refine ASBS Alternatives – Phase 1

Responsible Agency: City of Monterey

Current Status of Project:



Initial agency planning stage.

Linkages/Interdependencies with Other Projects:

The goal of the proposed project is to improve ocean water quality in the Pacific Grove Area of Special Biological Significance (ASBSs) and enhance the amount of recycled storm water available to local agricultural and recreational water users. However, Phase 1 of this project is to refine the 2006 feasibility study of alternatives to cease dry and wet weather discharges to ASBS and prepare CEQA documents.

If fully implemented, there could be an improvement in the ability to manage groundwater resources either inside or outside of the Region, especially during dry periods. If recycled water is used in the Salinas Valley, it could help alleviate overdraft of the Salinas Valley Groundwater Basin.

If recycled storm water from this project is used in the Planning Region, this would be one four projects proposed that could improve water quality in the Seaside Groundwater Basin aquifers, create a sustainable water supply for the Region, and reduce dependence on the Carmel River Basin. The resulting improvement of water resource management in the Carmel River Basin, especially during dry periods, would reduce impacts to riparian vegetation and aquatic habitats and threatened species in the area.

This project is also one of three proposed projects to improve near-shore water quality in the Monterey Bay National Marine Sanctuary by reducing storm water discharges (see Seaside 90-Inch Outfall Infiltration Component and CSUMB Storm Water Percolation Project).

Financial Feasibility:

Early feasibility cost estimate for project completion, implementing the preferred alternative, is approximately \$24 million. Phase 1 is to refine the feasibility study and prepare CEQA documents – at an estimated cost of \$450,000. The costs for Phases 2 through 4 will be defined as part of the Phase 1 work. It is expected that the program costs are less than if the stakeholders implemented separate programs.

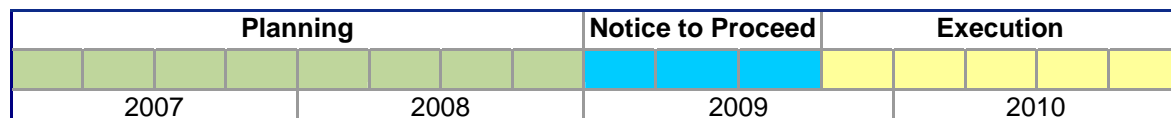
Considering the local water shortages, recycled water has value to many users because high-quality water can be diverted from some uses, such as agriculture and golf courses, to other domestic uses.

Stakeholders may fund local matching costs from payment in kind of staff time and user fees. Requested State funding for implementation of Phase 2 through 4 is to be determined based upon refined cost estimates.

Technical Feasibility:

Currently, there are no foreseen technical or environmental hurdles to this project. Subsequent engineering and biological assessments will provide more details regarding technical feasibility of future project implementations.

Project Timeline:



Institutional Structure to Ensure Implementation: City of Monterey

7.2 Institutional Structures to Ensure Implementation

The Monterey Peninsula Water Management District, as the lead agency of the Water Management Group, will ultimately be responsible for ensuring execution of the Plan. In order for the Plan to be truly successful, delegation of responsibility must be defined in a way that requires implementing entities to be responsible at the project level. As part of the preparation of the IRWMP, each participating agency is provided information that outlines the role and responsibilities of each agency. It is anticipated that contractual agreements for grant funds or other project funds between the lead agency and implementing entities will ensure that the goals and objectives of the IRWMP will be implemented.

As the projects outlined in this Plan are implemented, the issues and needs of the Region may change. Ongoing efforts of the Water Management Group and its partners will include review of the Plan performance measures, reprioritization or development of new strategies and, as appropriate, updates to the IRWMP.

7.3 Adaptive Management Process

An important function of an integrated regional plan is to outline a process for adaptive management, including a process for changing goals, objectives and priorities based on changing conditions in the Region. Political, physical, and regulatory changes constantly occur that may necessitate a dynamic response in order to continually optimize IRWMP implementation. These responses can occur on three levels:

- Project level
- Programmatic level
- Institutional level

7.3.1 Project Level Response

The nature of biological and natural processes involves a great deal of scientific uncertainty. It is therefore necessary to incorporate a systematic approach to managing projects as they are executed or operating. A project that is specifically aimed at identifying when adaptive change is necessary, the Project Monitoring Project, will continually monitor overall effectiveness as the BSLT projects are implemented. Many other projects introduced in this plan also incorporate monitoring components.

When monitoring reveals that a project fails to meet targets or needs to be modified due to, for example, environmental concerns or regulatory changes, operational modifications will initially be considered. The project will be surveyed to see if an operation or method can be modified to meet targets. Next, design changes will be considered to incorporate new technology or replace outdated technology. Lastly, if funding allows, replacement of the project may be necessary. If funding does not allow replacement, managers should conduct a cost-benefit analysis to determine if operating with deficiencies is better than the “do-nothing” approach. During any of these steps, project managers can utilize the experience of other agencies familiar with similar projects.

7.3.2 Programmatic Level Response

A programmatic response will first evaluate the feasibility and appropriateness of objectives. The Water Management Group and its partners will evaluate and compare obstacles encountered with similar regional efforts elsewhere. When targets need to be modified, the Water Management Group will hold stakeholder workshops in the same way the initial targets were adopted.

If objectives are reasonable, but projects fail to meet established targets, then new water management techniques or a different combination of strategies will be considered. During the process, the Water

Management Group will provide details on how new strategies can be successful where previous efforts failed.

If a project is performing better than expected, then the project managers could look for ways to expand these efforts to a larger scale or to spread them to other parts of the Region. An important tool for this will be improved communication and efficient data sharing between Regional entities as outlined in Chapter 10.

7.3.3 Institutional Level Response

Institutional changes are necessary when multiple regional objectives are not met and both project and programmatic level responses have been unsuccessful. The institutional structure will be evaluated, including the Water Management Group's decision-making process and how stakeholders are involved in regional decisions. Alternately, if a strategy, or combination of strategies, has been significantly successful, then the Water Management Group could seek ways to incorporate these methods into other areas of the region.

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Chapter 8 Impacts and Benefits

IRWM Standard H

This section discusses at a screening level the impact and benefits from Plan implementation, including an evaluation of potential impacts within the region and in adjacent areas from Plan implementation. This section identifies the advantages of the regional plan as well as which objectives necessitate a regional solution. It also identifies interregional benefits and impacts.

The benefits of integrated regional planning are prominent in a region that depends solely on rainfall, runoff, and groundwater resources within its boundaries to supply its water needs. The people and local governments of the Monterey Peninsula and surrounding areas have historically looked carefully at resource development and management plans with a desire to be good stewards of the precious natural resources and immense beauty in the area. In recent years, careful planning on a regional scale has become increasingly necessary in order to balance local water needs with regional resource sustainability.

8.1 Benefits of Integrated Regional Planning

Benefits resulting from implementing projects via integrated regional planning rather than as separate, independent efforts may include the following:

- **Increased regional understanding resulting from inter-agency communication and cooperation.** By using a consensus based approach to developing and implementing water management projects and programs, stakeholders ultimately gain a deeper understanding of the effects of their projects on other agencies. By collaborating on a regional scale that emphasizes a “big-picture” approach, agencies and stakeholders will be more likely to avoid costly conflicts. This may reduce permitting time and minimize other obstacles to project implementation.
- **Economies of scale resulting from collective management of economic, social, and natural resources.** Overlapping project scopes often leave room for duplicate efforts. Integrated regional planning offers a chance for stakeholders to enter into open forums for developing and implementing programs, thus optimizing the use of efforts and resources that support the same goal while also providing a niche for strategies that might not be feasible to implement independently.
- **Region-wide involvement in complex issues helps develop more well-rounded solutions.** The integration of multiple opinions in integrated planning encourages intra-regional communication by channeling various efforts into a single goal or project. Stakeholders and water agencies working collaboratively are more likely to result in a successful project.
- **Regional planning and project development leads to integration.** Integration provides multiple benefits which facilitates multiple funding source development to move project feasibility forward.
- **Improved local understanding of water resources issues resulting from consistent and coordinated public outreach and education programs.** A cohesive, consistent message given to the public reduces overall conflict at the regional scale and improves acceptance and understanding of the integrated projects.

8.1.1 Regional Problems Require Regional Solutions

The planning Region encompassed by this IRWMP includes several entities that are actively pursuing projects to ease the stress on local groundwater basins, restore Carmel River flows, improve impacted habitats, and allow long-term development within the Region.

Complex water resource management issues in the Region that will benefit from collaboration utilizing multiple water management techniques are:

- diversions from the Carmel River Basin that adversely affect threatened species, stream habitats and the Carmel River riparian corridor;
- pumping of groundwater in the Seaside Groundwater Basin at a rate that affects the long-term sustainability of the basin;
- NPS pollution and storm-water discharges to ASBS and the MBNMS;
- flooding in the Carmel Valley and at the Carmel River lagoon;
- inadequate and unreliable supply of water to meet current and future demand.

The sources of these concerns are regional, and while individual projects can contribute incrementally to a solution, it is coordinated implementation of projects that will lead to real, quantifiable solutions for the Region as a whole.

8.2 Impacts and Benefits

Implementation of the projects included in this Plan will lead to numerous benefits including:

- **Increased water supply reliability.** Water supply and water quality projects, including conjunctive use projects, will protect or enhance current supplies while providing a sustainable source to meet future demand. Some projects will utilize improved management techniques to make better use of existing sources.
- **Water quality improvement.** Storm water discharges to the ocean and to areas of special biological significance will be mitigated as a result of implementing the suite of projects in this IRWMP. Similarly, projects that include storm water BMPs will help control sedimentation throughout the Carmel River watershed. Additionally, the threat of seawater intrusion will be reduced in the Seaside Groundwater Basin and other NPS pollutants, such as sewer exfiltration and urban runoff, will be mitigated.
- **Public Protection.** Working with regional entities toward water supply solutions will minimize fiscal impacts to utility ratepayers. Implementation of flood control projects will reduce costly impacts to personal and commercial property and will protect human life. Improvement of water quality, especially at coastal beaches, will reduce threats to personal health.
- **Protection of beneficial uses.** The suite of projects in this Plan has the potential to provide and protect numerous recreational, aquatic life, habitat, and agricultural uses.

Implementation of the projects described in this Plan may also have quantitative and/or qualitative impacts if the projects are not managed or implemented well. These impacts may include increased project costs to agencies and rate payers; delayed construction of planned facilities leading to delayed water supply and other benefits; increased negative impacts on surface water or groundwater quality; and limited operational flexibility, especially in times of drought, leading to increased water rationing and associated pressure on water users and the environment. Impacts may also include limited future economic growth.

To ensure that the projects are implemented consistent with this Plan and that negative impacts are minimized or avoided, a framework for a program-wide project monitoring and assessment plan has been developed. This monitoring plan (see Section 9.2 Plan Performance) will work within the institutional structure responsible for project implementation (see Section 7.2 Institutional Structures to Ensure Implementation) and in conjunction with the adaptive management process outline in Section 7.3 Adaptive Management Process.

Table 8-1 summarizes the anticipated qualitative benefits and impacts associated with the projects in this Plan. More benefits and impacts may be quantified as a result of proposed stakeholder outreach prior to adoption of the Final IRWMP. It should also be noted that most projects proposed in this Plan will require a review for compliance with the California Environmental Quality Act (CEQA) and other laws pertaining to such projects prior to obtaining permits to implement proposed projects.

Table 8-1: Projects Impacts and Benefits

Project	Sponsor	Direct Qualitative Benefits	Direct Qualitative Impacts
Aquifer Storage and Recovery	MPWMD/CAW	Will reduce pumping from Carmel River, provide reliable supply, enhance riparian habitats, comply with regulatory orders	Potential short-term, construction- related impacts—mitigation measures and BMPs may be necessary
Seaside Basin Groundwater Replenishment Project	MRWPCA	Provide reliable supply, protect water quality	Potential short-term, construction-related impacts—mitigation measures and BMPs may be necessary
CSUMB Storm Water Percolation and Education Project	CSUMB	Protect MBNMS water quality, reduce NPS pollutants	Potential short-term, construction- related impacts—mitigation measures and BMPs may be necessary
Lower Carmel River Restoration and Floodplain Enhancement	BSLT/MCWRA /MPWMD	Enhance riparian habitats, improve flood capacity	Potential short-term, construction- related impacts—mitigation measures and BMPs may be necessary
Carmel River Watershed Volunteer Monitoring Program	CRWC	Provide critical data about regional ambient conditions	None identified
Sanitary Sewer System Repair and Replacement in the Cities of Monterey and Pacific Grove	Monterey/P.G.	Improve surface and groundwater quality	Potential short-term, construction- related impacts—mitigation measures and BMPs may be necessary
Implementation of Solid Waste Removal Technology	Monterey/P.G.	Reduce NPS pollutants in streams and near-shore ocean environments	None identified
Microbial Source Tracking in the Cities of Monterey and Pacific Grove	Mont/P.G./ Found.	Provide critical data	None identified
Refine ASBS Alternatives	Monterey	Protect ASBS water quality, reduce NPS pollutants in streams and near-shore ocean environments, provide recycled water	None identified
Water Conservation Retrofit Program	MPWMD	Reduce water use	None identified
Seaside 90" Outfall Infiltration Component	Seaside	Protect MBNMS water quality, reduce NPS pollutants	Potential short-term, construction-related impacts. —mitigation measures and BMPs may be necessary

8.3 Impacts to Disadvantaged Communities

As previously indicated in Section 3.8 Disadvantaged Communities, there are four census tracts comprising 17% of the population of the Region in the region that could qualify as disadvantaged communities in this region. The remainder of the Region (83% of the population) has a higher Median Household Income than the State average. There are no projects proposed in this Plan that have been identified as causing adverse impacts to or that directly benefit disadvantaged communities.

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Chapter 9 Technical Analysis and Plan Performance

IRWM Standard I

This section includes a discussion of data, technical methods, and analyses used in development of the Plan. Included in this section are:

- a discussion of measures that will be used to evaluate Project/Plan performance,
- monitoring systems that will be used to gather performance data, and mechanisms to adapt project operations and Plan implementation based on performance data collected.

A critical aspect of the integrated regional planning process is the amalgamation of planning documents, feasibility studies, natural resource assessments, species and ecosystems evaluations, and regional opinions into a single, living document. The Water Management Group recognized that including a diversified spread of information is necessary to provide the most comprehensive, up-to-date, and effective methods for addressing the Region's needs. These sources of information provide the backbone for defining specific metrics by which projects and objectives can be assessed. As a living document, the IRWMP will incorporate amendments to component plans and provide ways for including new information as it is developed.

The Water Management Group, with MPWMD as the Lead Agency, is responsible for ensuring proper execution of this Plan. However, implementing entities will be responsible at the project level. Partnerships between the Water Management Group, implementing entities, and stakeholders will foster the creation of an efficient system through which data can be collected, analyzed, stored, and easily accessed.

9.1 Technical Feasibility

To ensure the feasibility of the water management strategies being employed, several documents, as shown in **Table 9-1**, were referenced. These sources of information provide the technical merit by which obtainable targets were set.

Table 9-1: Documents Used in the Plan Development Process

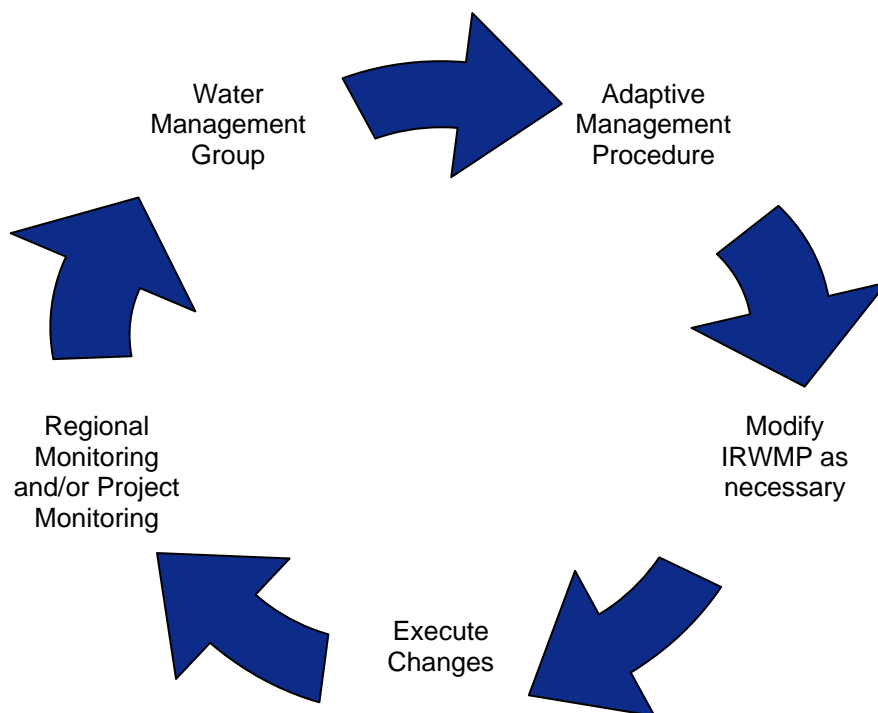
Project/Strategy	Reference Document	Technical Feasibility
Environmental Enhancement	Watershed Assessment and Action Plan of the Carmel River Watershed by Carmel River Watershed Conservancy, 2004 Carmel River Management Plan by MPWMD, 1984 Supplemental Carmel River Action Plan by Carmel River Watershed Conservancy, 2006	Performance of similar projects, preliminary assessments, environmental studies, and the expert opinions of experienced stakeholders were used to assess technical feasibility.
Recreation and Public Access	BSLT Carmel River Parkway Plan	Success of similar plans/projects, local expertise, and community support through the Carmel River Parkway Community Vision Plan were utilized to ensure both overall feasibility and technical competence of strategies.
Water Supply	Seaside Groundwater Basin: Update On Water Resource Conditions by MPWMD, 2005 Cal-Am Urban Water Management Plan 2006-2010 Seaside Groundwater Basin Monitoring and Management Plan, Seaside Watermaster, 2006 Final Statement of Decision, Seaside Groundwater Basin Adjudication, 2006 SWRCB Order No. WR 95-10, SWRCB 1995 and subsequent documents Carmel River Action Plan by Carmel River Watershed Conservancy, 2004	Previous engineering reports, pilot studies, and hydrologic/hydraulic modeling including the Carmel Valley Simulation Model (CVSIM) were used to estimate surface and groundwater storage in Carmel Valley and in the Seaside Basin.
Flood Protection	Monterey County Floodplain Management Plan, MCWRA, 2004 Carmel River Action Plan by Carmel River Watershed Conservancy, 2004	In addition to hydrodynamic studies in the Carmel Lagoon and hydrologic modeling throughout the rest of the region, updated floodplain mapping was conducted to assess feasibility of the planning measures.
Water Quality	Monterey Regional Storm Water Management Program, 2006	Monitoring efforts and supporting documentation provided entities participating in the Monterey Regional Storm Water Management Program Group

9.2 Plan Performance

The Water Management Group is developing the framework for a Regional Monitoring and Assessment Plan (RMAP) that will be used to ensure that objectives of this Plan are being met and that projects are implemented and operated as proposed so that negative impacts associated with poor management are avoided. This plan will work within the institutional structure responsible for implementation (see Section 7.2) and in conjunction with the adaptive management process outline in Section 7.3.

The RMAP consists of using quantifiable metrics to assess plan performance based on both project-specific and regional monitoring activities. For instance, several of the Monterey Peninsula cities have conducted storm drain monitoring for a number of years. These data could be used as an *a posteriori* condition for comparison of data collected after the Plan is implemented. Where there is a data gap, monitoring activities after the Plan's adoption will consist of expanded or new monitoring activities that will provide the data necessary to develop conclusions about the Plan's performance. This information will be discussed at regular meetings with the Water Management Group and its partners. **Figure 9-1** is a conceptual view of the RMAP process.

Figure 9-1: The Regional Monitoring and Assessment Plan (RMAP) Process



In order to assess the Plan's success, it is necessary to define metrics that objectively measure the effectiveness of the water management strategies as they are implemented. **Table 9-2** summarizes these metrics. These are examples of the types of data that will be collected during and after implementation of the Plan.

Table 9-2: Metrics for Evaluating Strategies and Objectives

Water Management Strategy	Metric
Ecosystem restoration	Acreage or lineal measurement of riparian corridor restored, increase in species count and abundance.
Environmental and habitat protection and improvement	Acreage or lineal measurement of riparian corridor improved, increase in species count, number of fish migration barriers removed.
Water supply reliability	Annual-acre-feet (AFA) of groundwater protected, AFA of water production, % of demand met under adverse conditions (drought or other emergency).
Flood management	Residential, commercial or industrial acreage or number of structures protected, lineal measurement of floodway capacity improved.
Groundwater management	AFA of pumped groundwater below sustainable yield, AFA of water injected as recharge, groundwater levels.
Recreation and public access	Acreage of open space and lineal measurement of trails created.
Storm water capture and management	Number of BMPs installed, reduced volume of storm water discharge to ASBS, pounds per year of sediment reduction in surface water, beach closure reductions.
Water conservation	Decrease in AFA/household of water demand.
Water quality protection and improvement	Improved water quality parameters in the MBNMS, improved Carmel River water quality parameters, AFA of pumped groundwater below sustainable yield, water quality analyses.
Water recycling	AFA increase of recycled water.
Wetlands enhancement and creation	Acreage of wetlands created or enhanced.
Conjunctive use	AFA of water determined to be used conjunctively, e.g. diversions to ASR.
Land use planning	Acreage of land managed, protected, or enhanced to protect beneficial uses of water.
NPS pollution control	TSS pollutant reduction, pounds/year of sediment reduction, number of BMPs installed, beach closure reductions.
Watershed planning	Acreage of watershed protected or enhanced, acreage of land with improved management activities, number of recommendations incorporated from the RWQCB Watershed Management Initiatives.
Water and wastewater treatment	AFA increase of water and wastewater treatment capacity.

9.2.2 Current Monitoring and Data Collection

Existing monitoring efforts in the Region have been very successful in generating data necessary for the public, water resources managers, and relevant regulatory agencies to successfully manage regional water resources. MPWMD and others monitor several wells in the Seaside Groundwater Basin for water quality, depth to groundwater, and water production data. Wells in the coastal portion are monitored monthly, while wells located farther inland are monitored quarterly. Transducers have been placed in several wells to continuously measure drawdown and recovery. Water injected into the Seaside Basin through a full-scale test injection well is monitored and logged for a number of parameters including pH,

temperature, conductivity, and coliform. The Court decision on water rights in the Seaside Groundwater Basin has mandated the development of a basin monitoring and management plan. This monitoring plan will become an integral part of assessing future impacts to the Seaside Groundwater Basin.

MPWMD conducts surface water quality monitoring as part of its environmental protection program. Seven parameters (dissolved oxygen, carbon dioxide, pH, temperature, turbidity conductivity, and salinity) are measured at three sites (Carmel River Lagoon, below San Clemente Reservoir, and below Los Padres Reservoir) in the CRB. In addition, temperature is measured at 12 stations along the main stem of the Carmel River. The Central Coast Ambient Monitoring Program (CCAMP) has a water quality monitoring site in the Carmel River along Highway 1.

The Coast Long-term Environmental Assessment Network (CCLEAN) is a cooperative long-term monitoring program that satisfies the NPDES receiving water monitoring and reporting requirements of five entities including the Cities of Santa Cruz and Watsonville, LS Power Energy, the Monterey Regional Water Pollution Control Agency, and the Carmel Area Wastewater District. CCLEAN measures inputs of possible water quality stressors and effects in nearshore waters by sampling effluent, rivers and streams, mussels, sediments and benthic communities. Effluent for each municipal discharger and river is sampled for persistent organic pollutants, nutrients, and suspended sediments using automated equipment to obtain 30-day-flow-proportioned samples in the dry and wet seasons.

The Monterey County Water Resources Agency administers the FEMA National Flood Insurance Program (NFIP) for Carmel Valley and maintains maps of the 100-year floodplain and floodway. These maps are periodically updated to reflect changes to the floodplain.

Aerial photography of the Carmel River has been performed annually since 1983 between Carmel Bay and San Clemente Dam. These photographs are required as a condition of use by Cal-Am for four municipal supply wells installed in the Lower Carmel Valley after the 1976-77 drought. The photographs are used to monitor the effects of groundwater production on riparian vegetation along the river, but can have other applications in monitoring this area. Since 2005, MPWMD has received these photos in both digital and hard copy format. Complete sets of standard prints for selected years between 1939 and 1983 are also available at the UC Santa Cruz map library. With the advent of an accessible Global Positioning System and recent improvements in digital aerial photography, MPWMD, CRWC, AMBAG, Monterey County, and others have cooperated to obtain high resolution orthometric images that can be used in generating 2-d and 3-d images of the landscape. These are useful both as a planning and monitoring tool. MPWMD has been working with DWR to establish a system to archive these documents for future use.

9.2.3 Future Monitoring and Data Collection

The Water Management Group and Stakeholder Group will build on existing efforts to collect and organize data regarding groundwater production, water levels, water use, land use, rainfall, water quality and other pertinent information useful to integrated regional planning. Several additional monitoring activities are likely to occur as result of individual project monitoring, as multi-project effectiveness monitoring, or as general water quality monitoring.

Monitoring programs developed for each project will be incorporated into the overall monitoring of the IRWMP to be carried out by the Water Management Group. **Table 9-3** describes existing and proposed monitoring activities that can be used to assess project effectiveness. Specific parameters to be monitored at each project will be developed at the time project descriptions are finalized for inclusion in the adopted IRWMP. Several of the monitoring programs within the planning Region are described below.

Data from these monitoring efforts will be coordinated with efforts by the Monterey Bay National Marine Sanctuary, CCAMP, CCLEAN, and the Carmel River Watershed Conservancy's Volunteer Monitoring project (VMP). The Carmel River VMP will provide the essential component to assess and evaluate ongoing impacts to water conservation and water quality projects that will occur as part of the IRWMP process.

Table 9-3: Project Monitoring

Project	Existing Monitoring	Planned Monitoring	Potential Parameters Monitored
Seaside Groundwater Basin Aquifer Storage and Recovery	MPWMD well monitoring for quality and quantity parameters.	Carmel River Watershed Water Quality Volunteer Monitoring, continue existing monitoring	Flow meters on wellheads and for recording water pumped / delivered; water quality parameters such as TDS and DBPs
Seaside Basin Groundwater Replenishment Project	Watermaster monitoring, MPWMD well monitoring	Continue existing monitoring. Additional water quality and groundwater level data will be collected.	Flow records from reclamation booster pump station, wellheads and surface water intake structures, and water pumped / delivered. Successful execution and implementation of user agreements. Required Title 22 monitoring and reporting to RWQCB. Water Quality parameters such as TDS, nitrate/total nitrogen and DBPs. Opinion/Behavior Surveys.
CSUMB Storm Water Percolation and Education Project	None	Facilities Services & operations will monitor and report any problems	Amount of native habitat and species restored; volume of water percolated. Opinion/Behavior Surveys. Public opinion poll. Water Quality parameters such as TDS and metals.
Lower Carmel River Restoration and Floodplain Enhancement	Real-time flow gages along the Carmel River; Periodic avian species, water quality and riparian vegetation monitoring.	Continue existing monitoring. Expand into restored area.	Acreage and/or number of structures removed from 100-year floodplain; peak stage; water quality parameters such as DO, TDS, pH, temperature and sedimentation; site inspection, post-construction performance monitoring; acreage of the site converted to native vegetation from existing use; visitor counts, biological surveys
Carmel River Watershed Volunteer Monitoring Program	None	This project will provide critical water quality data.	Database maintenance, Annual reporting
Sanitary Sewer System Repair and Replacement in the Cities of Monterey and Pacific Grove	Receiving water and Near-Shore Water Quality Monitoring	Continue existing monitoring.	Feet of sewer replace/repared annual; water quality at discharge locations and offshore
Implementation of Solid Waste Removal Technology	Receiving waters and Near-Shore Water Quality Monitoring, Volunteer Monitoring	Continue existing monitoring.	Volume of solid waste removed annually, number of days of nearshore water quality impairment, water quality parameters

Project	Existing Monitoring	Planned Monitoring	Potential Parameters Monitored
Microbial Source Tracking in the Cities of Monterey and Pacific Grove	None	This project will collect valuable microbial water quality data.	Water quality parameters such as coliform bacteria, turbidity
Refine ASBS Alternatives	Water quality at selected outfalls	Continue monitoring water quality	Water quality and quantity of discharge to ASBS
Water Conservation Retrofit Program	Water use is closely monitored by MPWMD	Continue monitoring program	Number of acre-feet conserved; cost savings accrued
Seaside 90" Outfall Infiltration Component	First flush program	Continue monitoring program	Amount of native habitat and species restored; volume of water percolated; water quality at discharge point

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Chapter 10 Data Management

IRWM Standard J

This section discusses mechanisms by which data will be managed and disseminated to stakeholders and the public, and includes discussion of how data collection will support statewide data needs. Included is an assessment of the state of existing monitoring efforts for water quantity and water quality, and identification of data gaps where additional monitoring is needed.

10.1 Current Data Management

The Monterey Peninsula Water Management District (MPWMD) is currently reviewing planning documents and agency agreements related to water management in the Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management Plan Area. Many of these documents are held in the MPWMD original documents files. Once this information has been filtered and condensed into a format appropriate for the Integrated Regional Water Management Plan, it will be held as hard copies and electronic document files in the MPWMD main office. These files may be requested by the public. As staff resource availability permits, these documents are being made available on the web.

The MPWMD routinely satisfies data requests from the public by providing copies of reports on CD, e-mailing files, or sending hard copies. It is a long-term goal to incorporate new data with spatial components into MPWMD's Geographic Information System. These components include various jurisdictional boundaries, natural topography, water ways, and major water distribution infrastructure. Any new spatial information gathered during the development and implementation of the Plan will reside on MPWMD computers. State and public data requests will be satisfied by distributing the information on CD-ROM.

As the lead agency of the Water Managers Group, MPWMD will coordinate outreach activities of the implementation of this plan. The MPWMD is experienced in public outreach through presentations at the Oceans Fair, Watershed Festival, Carmel River Advisory Committee, and the Carmel River Watershed Conservancy. MPWMD plans to update the public when certain milestones are achieved in the planning process through presentations to these organizations and updates to the MPWMD website. Other government agencies and the public are also informed of MPWMD activities and plans through regular MPWMD Board Meetings and the Board Packet which is distributed to local libraries.

10.1.1 California State Databases

The California Environmental Resources Evaluation System (CERES) is an information system developed by the California Resources Agency to facilitate access to a variety of electronic data describing California's rich and diverse environments. The goal of CERES is to improve environmental analysis and planning by integrating natural and cultural resource information from multiple contributors and by making it available and useful to a wide variety of users. MPWMD currently uploads critical documents to the CERES database.

MPWMD also subscribes to California Department of Fish and Game's California Natural Diversity Database (CNDDB). The CNDDB contains over 47,000 records on more than 2,500 rare native species and natural communities. RareFind is a research tool that allows MPWMD to search the CNDDB or access the spatial data through a GIS platform.

MPWMD routinely makes use of the California Department of Forestry and Fire Protection vegetation and topography databases. The California Spatial Information Library is also used as a resource for their water, vegetation, habitat and biological databases

10.1.2 The Central Coast Water Quality Synthesis, Assessment and Management (SAM) Project

The Monterey Bay National Marine Sanctuary (MBNMS) and its adjacent watersheds are at the center of numerous ongoing long term water quality monitoring programs that include physical, chemical, and biological measurements. Initial water quality data integration efforts by the Sanctuary Integrated Monitoring Network (SIMoN) program showed that Central Coast monitoring programs differ in their objectives, spatial/temporal extent, parameters measured, sample matrix, monitoring frequency, and data quality. Much of the data collected by individual monitoring programs has been over a limited geographic range and stored in formats that are not useful for analysis outside of the data generating organization. There is presently no method to effectively integrate, manage, and utilize the diverse data sets collected by regulatory agencies, academic institutions, businesses, and non-profit organizations. Consequently, the utility of the full body of water quality data that exists for investigating questions about water pollution is generally unknown on the Central Coast.

By compiling these data sets into one database, the SAM project is implementing a watershed based approach to address questions about non-point source pollution that facilitates a high level of coordination between monitoring organizations and uses water quality data in conjunction with information on land use practice changes. The objectives of the SAM project have been developed in close partnership with the Central Coast Regional Water Quality Control Board, the California Coastal Commission, and the California Environmental Protection Agency. These are: (1) Integrate existing water quality and geographic data sets to address the sources, status, and trends of water pollutants; (2) Gather, analyze, and map information on recently implemented agricultural best management practices (BMPs) within Central Coast watersheds; and (3) Develop a model for ongoing data integration, analysis, and reporting with input from stakeholders.

Critical questions that the SAM project deals with include: Are pollutant levels increasing or decreasing over time? Have the implementation of BMPs affected water pollution levels? Are monitoring and BMP implementation efforts consistent with the level of water quality problems? The SAM project will identify programmatic and information gaps that serve as barriers to understanding interactions between anthropogenic changes in coastal watersheds and pollution levels in freshwater, estuarine, and marine environments. The water quality monitoring data collected through projects implemented as part of this IRWM Plan will be incorporated into the SAM evaluation. A schematic diagram of the relationships between local and Regional monitoring program is shown in **Figure 10-1: Integrated Monitoring Program**. The MBNMS has undertaken an effort to link water quality data with management measures in order to evaluate BMP implementation and effectiveness. Efforts conducted as part of the Plan will be incorporated into the water quality evaluation. MBNMS proposes to facilitate a data acquisition program along the Central Coast Region to coordinate several existing and proposed monitoring programs.

10.1.3 The Sanctuary Integrated Monitoring Network (SIMoN)

The Sanctuary Integrated Monitoring Network (SIMoN) enables researchers to monitor the sanctuary effectively by integrating the existing monitoring programs and identifying gaps in information. By avoiding duplication of these programs, resources can be more effectively directed towards surveying and characterizing habitats, assessing the impact of natural processes or human activities on specific resources, and long-term monitoring. SIMoN has developed a website and an interactive map specifically targeting the issue of water quality, which may serve as a site that displays the data from the Plan.

10.1.4 Monterey County, AMBAG, Army Corp of Engineers, and other agencies

The MPWMD has an agreement to receive monthly updates from the Monterey County Assessor's office for land use and property ownership information. To complement these data, MPWMD also receives GIS parcel layers on a quarterly basis. MPWMD has access to the water quality database information at

Monterey County Environmental Health Department, infrastructure datasets from the Army Corp of Engineers (Fort Ord), and transportation network database from the Association of Monterey Bay Area Governments (AMBAG). The MPWMD is currently working with other organizations such as California State University Monterey Bay, Watershed Institute, the City of Monterey, and the Pebble Beach Community Service District to collaborate and share information.

10.2 Future Data Dissemination

Future data collection and dissemination will occur primarily through MPWMD. Regional data will be collected and shared via current methods with special attention focused on ways to improve data sharing. MPWMD is developing an electronic document library that will ease data transfers between water purveyors and stakeholders.

The Water Management Group is committed to cooperation with the State to provide data that are consistent with statewide data needs. The data acquired in the IRWMP process is to be managed in a format compatible with State and Federal databases such as Surface Water Ambient Monitoring Program (SWAMP), Groundwater Ambient Monitoring Assessment (GAMA), and California Environmental Resources Evaluation System (CERES). The data produced will be shared with these programs. Reports that are developed through the IRWMP process will be provided to the appropriate State and Federal agencies for use in their programs on at least an annual basis.

A schematic of the proposed network for an integrated monitoring program is shown in **Figure 10-1: Integrated Monitoring Program**.

10.2.1 MPWMD Geographical Information System

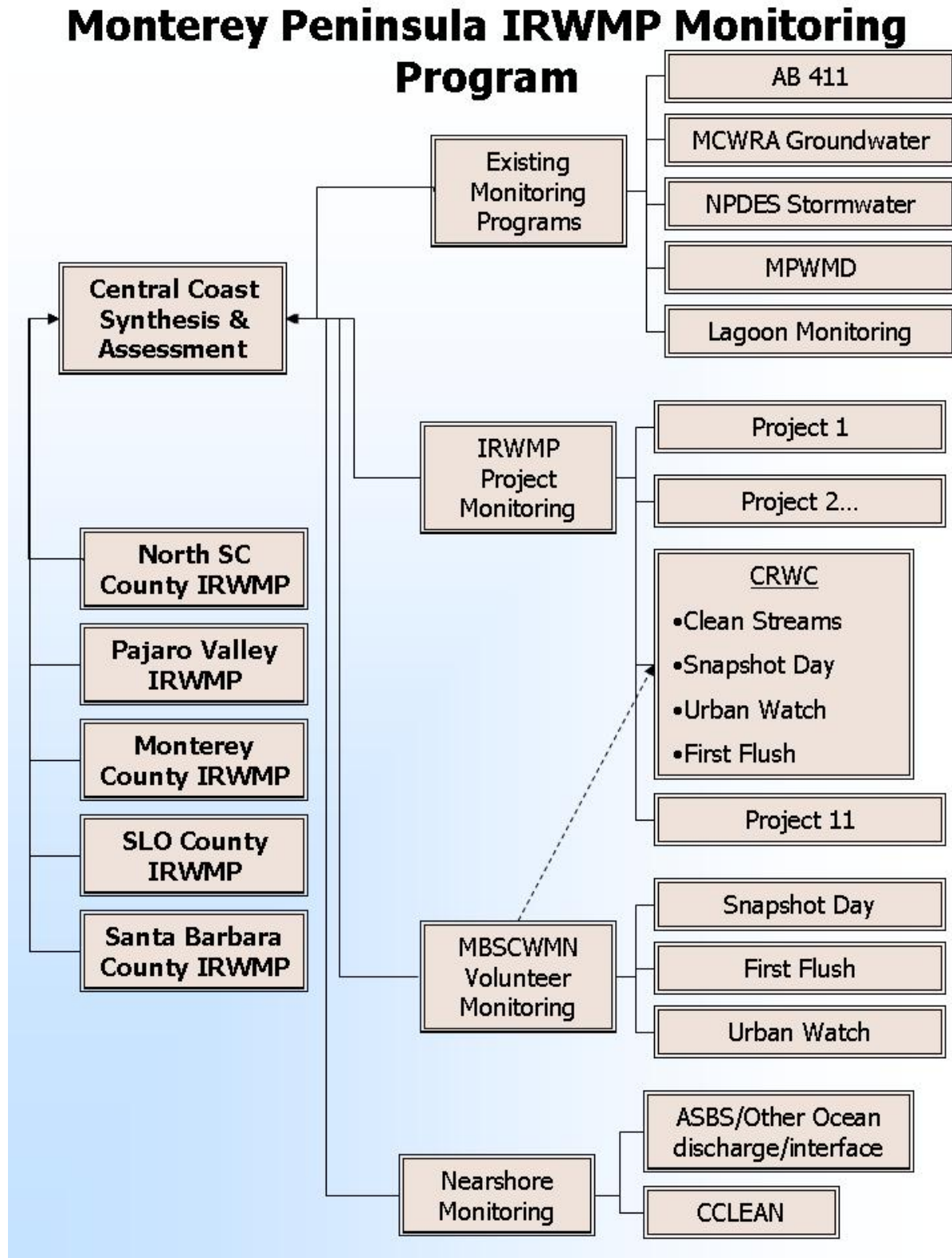
As part of the 2005 MPWMD *Geographical Information System (GIS) Implementation Plan*, a phased five-year implementation strategy was recommended. As part of this strategy, a web-based centrally located GIS platform was recommended to provide public access to the spatial information, maps and data available in the MPWMD GIS.

This *GIS Implementation Plan* addresses the ease of use of GIS products being developed for non-professional users, to be able to access and work with this system. A centralized GIS application server will be able to provide easy-to-use GIS services via a simplified user interface. A web based mapping application will be developed so that the general public can access these datasets over a secure internet connection. This will be an enhancement to the current GIS system that is available only to MPWMD staff and move it towards an enterprise wide application.

The GIS platform serves many purposes for data analysis needs that include map production, spatial analysis in support of engineering, water resource management, fisheries, conservation, and water rationing analysis. All of these functions require the examination of geographic data, management and dissemination of these data throughout the planning Region. The effectiveness of the GIS to better serve the public will largely be achieved through data management functions which are provided with the Enterprise GIS software

In addition to creating the enterprise GIS platform, MPWMD will upgrade the ERDAS LPS digitizing software license to a newer version. Annually, CAW is required to obtain aerial photography of Carmel Valley from the ocean to San Clemente Reservoir as a condition of the use permit issued by Monterey County for CAW's four lower Carmel Valley wells. For the past twenty years, MPMD has received yearly photos in a hardcopy color format. These colored aerial photos have not been digitally processed and, therefore, cannot be synthesized into the GIS platform. As part of the MPWMD effort to synthesize and make geospatial data more readily available, these photos are being scanned and prepared for digital processing. The ERDAS LPS software upgrade provides an economical and cost effective method for processing and synthesizing the historic aerial photos. The digital, geo-referenced aerial photos will enable the production of an accurate base layer of historical information for such uses as monitoring Carmel River riparian and lagoon vegetation.

Figure 10-1: Integrated Monitoring Program



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Chapter 11 Plan Funding and Financing

IRWM Standard K

This section identifies beneficiaries and potential funding/financing for Plan implementation. Also included in this section is discussion of ongoing support and financing for operation and maintenance of implemented projects.

11.1 Beneficiaries of Plan Implementation

The entire region will benefit from the projects identified and prioritized in this plan and their improvements to water supply, water quality, flood protection and environmental protection. Specific beneficiaries of the Plan include: residents and visitors in the Region; commercial and non-profit operations involved in tourism, hospitality, and recreation; educational institutions such as California State University Monterey Bay; Cities, special districts, and Monterey County agencies. Specific beneficiaries for each project are listed in **Table 11-1**.

11.2 Plan Funding

Funding of capital and O&M costs will be the responsibility of the Plan stakeholder who sponsors each project. Project financing can be achieved through several approaches as described below. These approaches may or may not be used by the Water Management Group for project financing.

Development Impact and Mitigation Fees

Development fees are used by water resource agencies almost universally as a measure to achieve and maintain equity among its past, present and future customers. Development fees are typically charged per connection, measured in equivalent dwelling units (“EDUs”). A single connection may encompass more than one EDU. In addition to the connection fee aspect of development fees, agencies may also assess other fees such as the Commercial Acreage Fee (per acre) and Other Service Fee (per acre).

User Fees

User fees are non-land-based charges made by some water resource agencies where facilities and programs directly benefit the existing customers. For example, within the MPWMD boundary, a user fee is assessed on each connection to the Cal-Am system to pay for mitigation for water extraction and to fund projects that will reduce water use or replace existing unauthorized diversions. The user fee is a fixed percentage of the monthly water bill, which usually includes a base amount for a connection and a variable amount based on the metered usage. User fees for specific services are assessed by other agencies within the Region including MRWPCA and CAWD. Cal-Am rates are set by the California Public Utilities Commission.

General or Capital Improvement Funds

General or capital improvement funds are monies that an agency sets aside for funding general operations and/or facility improvements or upgrades. These funds are usually part of their overall revenue stream and may or may not be project-specific.

Bonded Debt Service (Revenue Bonds)

Issuance of revenue bonds to pay for new capital is done in cases where a large facility is needed to support current services and future growth. In this way, a large facility can be paid for by bonded debt service at the time of construction with repayment of the debt service over a 20- to 30-year timeframe. This is a preferred approach to paying for high cost facilities because it avoids the perceived over-

collection of fees from past customers that go towards facilities that serve present and future customers. A user fee or rate must be pledged to the project as a bond document covenant in the event that development fees are not adequate to make the required annual payment for the debt service.

Grant Programs

Grant programs at the local, state, or federal level are available to the region from time to time. In the past, the Water Management Group members have applied for and obtained state and federal funding for studies and projects benefiting the region. These monies typically require that a local matching amount be available to obtain the grant that typically comes from one or more of the funding sources above or from another grant. The matching requirement shows a local commitment to promoting and completing the study or project. A grant is typically administered and contracted by a single agency within the region that works directly with the state or federal granting agency. There are typically higher administration costs for grants since a small portion of the grant also pays for administration of the grant by the state or federal agency.

Land Trusts and other Non-Profit Sources

Land trusts are often used as a way to conserve land and can attract donations from private parties for furthering the mission of a particular trust. Recently, both the Big Sur Land Trust and the Nature Conservancy, another non-profit group, have taken a more active role in water resource management. Local non-profit groups, such as the Carmel River Steelhead Association and the Carmel River Watershed Conservancy, also raise private funds and donate resources and funds to carry out water resource-related activities.

11.3 Project Specific Financing

The beneficiaries and financing plan for each project is summarized in **Table 11-1**.

Table 11-1 Project Financing

Project	Responsible Agency	Project Beneficiaries	Estimated Cost	Funding Source
Aquifer Storage and Recovery	MPWMD/ CAW	Region	N/A	N/A
Seaside Basin Groundwater Replenishment Project	MRWPCA	Region	\$2,200,000	To be identified
CSUMB Storm Water Percolation and Education Project	CSUMB	Seaside Basin/ Monterey Bay	3,526,000	To be identified
Lower Carmel River Restoration and Floodplain Enhancement	BSLT/ MCWRA/MP WMD	Lower Carmel River	1,675,000	To be identified
Carmel River Watershed Volunteer Monitoring Program	CRWC	Region	750,000	To be identified
Sanitary Sewer System Repair and Replacement in the Cities of Monterey and Pacific Grove	Monterey/ P.G.	Monterey/PG/ Monterey Bay	9,407,500	To be identified
Implementation of Solid Waste Removal Technology	Monterey/ P.G.	Monterey/PG/ Monterey Bay	990,000	To be identified
Microbial Source Tracking in the Cities of Monterey and Pacific Grove	Mont/ P.G./ Found.	Monterey/PG/ Monterey Bay	252,000	To be identified
Refine ASBS Alternatives	Monterey	Monterey/PG/ PG ASBS	450,000	To be identified
Water Conservation Retrofit Program	MPWMD	Region	160,000	To be identified
Seaside 90" Outfall Infiltration Component	Seaside	Region	8,325,000	To be identified
Total			\$27,735,500	

11.3.1 Projects with Detailed Financial Plans

Because projects are in an initial planning stage, detailed plans for funding have not been developed.

11.3.2 Support and Financing for Operation and Maintenance of Implemented Projects

Ongoing support and financing for operation and maintenance (O&M) of projects implemented from this IRWMP is expected to come from many of the same sources used to implement the projects. Support and financing will likely come primarily from local sources, including user rates, fees and assessments.

Operation and maintenance of implemented projects will be the responsibility of individual project sponsors. However, it is the intent of the stakeholder group to form a technical review committee to review project proposals and implementation for conformance with the proposed Final Plan for adoption and to offer support for and coordination of grant and funding opportunities.

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Chapter 12 Statewide Priorities

IRWM Standard L

This section identifies statewide or State agency priorities that will be met or contributed to by implementation of the Plan, proposal, or specific projects. The section describes how the Plan, proposal, or specific projects were developed pursuant to Statewide Priorities.

Statewide priorities were incorporated into many aspects of the integrated regional planning process. The project selection and prioritization process described in Chapter 6 includes a qualitative evaluation of how projects would meet Statewide Priorities; however, no quantitative score was given to each project in this category. Statewide Priorities applicable within the planning Region include:

- Reduce conflicts between water users or resolve water rights disputes;
- Implementation of the RWQCB Watershed Management Initiative Chapters Plans and Policies;
- Implementation of SWRCB's Non Point Source Pollution Plan; and
- Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or species recovery plan.

The following Statewide Priorities are not applicable at present in the Region but may be important in the future:

- Implementation of Total Maximum Daily Load (TMDL) requirements for water body pollutants that are established or under development; and
- Environmental justice or disadvantaged community concerns.

See **Table 12-1 Evaluation of Statewide Priorities**, for a summary of Statewide Priorities fulfilled by projects in this Plan.

12.1 Relation to Statewide Priorities

A description of how this IRWMP has addressed statewide priorities is provided below.

12.1.1 Central Coast RWQCB Region 3 Watershed Management Initiative (2002)

Three of the priority activities identified in the 2002 Watershed Management Initiative parallel projects proposed in this Plan. These priorities include development of a riparian corridor protection policy and expansion of non-point source pollution management efforts that address impacts of sedimentation, nutrients, and pesticides from agricultural activities.

The Lower Carmel River Restoration and Floodplain Enhancement Project supports environmental habitat protection and improvement and emphasizes riparian habitat improvement while providing some 100-year flood reduction and enhanced recreational opportunities.

The Carmel River Volunteer Monitoring Project (VMP) will be an integral part to assessing changes in the watershed. Water quality parameters will be collected to associate the impacts of upstream activities on downstream environments.

12.1.2 RWQCB Central Coast Region 3 Watershed Management Initiative Update 2004

In September 2004, the Central Coast Watershed Management Initiative Update was released with an increased focus on agricultural water quality impacts. As previously mentioned, the Lower Carmel River Restoration and Floodplain Enhancement Project will reduce sediment pollution in the Carmel River through restoration of floodplain that is currently in agricultural use. These efforts will achieve management goals of minimizing impacts to water quality and sensitive aquatic habitats in the Carmel River Watershed.

12.1.3 Central Coast Regional Water Quality Control Board Basin Plan

The main goal of the Central Coast Regional Water Quality Control Board is to ensure that the water resources of the Central Coastal Basin are preserved for future generations of Californians. Those goals that most closely coincide with projects proposed in this Plan include:

- Protect and enhance all basin waters, surface and underground, fresh and saline, for present and anticipated beneficial uses, including aquatic environmental values.
- The quality of all surface waters shall allow unrestricted recreational use.
- Reduce and prevent accelerated (man-caused) erosion to the level necessary to restore and protect beneficial uses of receiving waters now significantly impaired or threatened with impairment by sediment.

The Carmel River Volunteer Monitoring Project (VMP) will provide the critical data necessary to assess basin homeostasis²⁹. Protecting Our Ocean--California's Action Strategy (Ocean Action Plan 2004)

Many of the objectives proposed in this Plan closely parallel the goals identified in the 2004 *Protecting Our Ocean--California's Action Strategy*.

Increase the Abundance and Diversity of Aquatic Life

The first goal of the Ocean Action Plan is to increase the abundance and diversity of aquatic life in California's ocean, bays, estuaries, and coastal wetlands. Two projects—Microbial Source Tracking and Implementation of Solid Waste Removal Technology projects will improve near-shore water quality by reducing trash and investigating the source of other pollutants

Other projects will fulfill this goal through direct and indirect riparian and wetland restoration efforts; the Lower Carmel River Restoration and Floodplain Enhancement Project will restore riparian habitat. Projects in the Seaside Groundwater Basin will indirectly protect the Carmel River riparian corridor by reducing the amount of water diverted from the river.

Improve Water Quality

The second goal of the Ocean Action Plan is to improve water quality in near-shore, bay, estuary, and coastal wetlands environments. Three projects support this goal by improving water quality in near-shore environments (Refine ASBS Alternatives, Seaside 90-Inch Outfall Infiltration Component, CSUMB Stormwater Percolation and Education). These projects will reduce discharges to the MBNMS and provide a useful and safe environment for public enjoyment (another goal in the Ocean Action Plan)

²⁹ The ability or tendency of an organism or cell to maintain internal equilibrium by adjusting its physiological processes. For example, body temperature.

Providing a marine and estuarine environment that Californians can productively use and safely enjoy is the third goal of the Ocean Action Plan. The Lower Carmel River Restoration and Floodplain Enhancement Project will improve recreational usage and increase public access to the Carmel River by providing a link to other trails and roads in the area.

Three other projects have been identified (Microbial Source Tracking, Sanitary Sewer System Repairs, and Implementation of Solid Waste Removal Technology) that will ultimately lead to improvements in the reliability of coastal water for safe, public enjoyment.

Sediment Management

One part of the Ocean Action Plan is to complete the California Coastal Sediment Management Plan. The Lower Carmel River Restoration and Floodplain Enhancement Project, and Seaside and CSUMB projects to encourage storm water infiltration support the actions of this management plan.

12.1.4 California's Non Point Source Pollution Control Program (2000)

The 2000 Plan for California's Non Point Source Pollution Control Program identifies goals to reduce non-point source pollution in both pristine areas and water bodies listed on the Clean Water Act Section 303(d) list. One of these goals is to manage NPS pollution at the watershed level utilizing local stewardship and site-specific BMPs. As described above, several projects will directly reduce sediment loads and other NPS pollutants either by BMP implementation or by curtailment of land-uses that could adversely affect watershed health. One project that will remove pollutants is the Solid Waste Removal Technology project while another will determine the source of contaminants so that informed water management decisions can be made.

Table 12-1 Evaluation of Statewide Priorities

Project	Statewide Priorities					
	Reduce conflict between water users or resolve water rights disputes	Implementation of TMDL's that are established or under development	Implementation of the RWQCB Watershed Management Initiative Chapters, Plans, and Policies.	Implementation of SWRCB's NPS Pollution Plan	Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or species recovery plan	Address environmental justice or DAC concerns
Aquifer Storage and Recovery	✓	N/A	✓		✓	TBD
Seaside Basin Groundwater Replenishment Project	✓	N/A	✓		✓	TBD
CSUMB Stormwater Percolation and Education Project		N/A	✓	✓	✓	TBD
Lower Carmel River Restoration and Floodplain Enhancement		N/A	✓	✓	✓	TBD
Carmel River Watershed Volunteer Monitoring Program		N/A	✓	✓	✓	TBD
Refine ASBS Alternatives	✓	N/A			✓	TBD
Water Conservation Retrofit Program	✓	N/A	✓	✓	✓	TBD
Sanitary Sewer System Repair and Replacement in the Cities of Monterey and Pacific Grove		N/A	✓	✓		TBD
Implementation of Solid Waste Removal Technology		N/A	✓			TBD
Microbial Source Tracking in the Cities of Monterey and Pacific Grove		N/A				TBD
Seaside 90" Outfall Infiltration Component	✓	N/A	✓	✓	✓	TBD

N/A – not applicable until total maximum daily loads are established for the Region

TBD – to be determined if new IRWM guidelines require

Chapter 13 Relation to Local Planning

IRWM Standard M

This section discusses how the IRWM Plan relates to planning documents and programs established by local agencies. It demonstrates coordination with local land-use planning decision-makers, and discusses how local agency planning documents relate to the IRWM strategies and the dynamics between the two planning documents. Included is a discussion of the linkages between the Plan and local planning documents.

During the integrated regional planning process, MPWMD coordinated the development of the IRWM Plan with local government, non-profit, and commercial groups in an effort to organize local planning. Several component parts of this Plan were aligned with or include elements of local plans including (responsible agency shown in parentheses):

- Monterey County General Plan (Monterey County)
- Carmel River Watershed Assessment and Action Plan (CRWC)
- Big Sur Land Trust Carmel River Parkway Vision Plan (BSLT)
- 2003 Monterey County Floodplain Management Plan (MCWRA)
- California American Water 2006-2010 Urban Water Management Plan (CAW)
- Carmel Valley Master Plan (Monterey County)
- Carmel River Management Plan (MPWMD)
- 2004 Pacific Grove Sewer System Asset Plan (Pacific Grove)
- 2006 Carmel River Lagoon Long Term Management Plan (Carmel River Lagoon TAC)
- Monterey Regional Storm Water Prevention Program (MRSWMP)
- 2006-07 MPWMD Strategic Plan (MPWMD)
- Seaside Groundwater Basin Final Statement of Decision (State of California)
- Seaside Groundwater Basin Monitoring and Management Plan (Seaside Groundwater Basin Watermaster)
- Monterey Bay Draft Management Plan (MBNMS)

There are several concurrent planning efforts to augment water supplies in the Planning Region, some of which do not include projects described in this IRWMP (e.g., proposed desalination projects). The Water Management Group, stakeholder group, and Technical Advisory Committee, which is comprised of staff from water resources management agencies from throughout the Region, will be directly involved in assuring that proposed water supply projects are consistent with local planning efforts. To the extent feasible, projects in this IRWMP will be designed and implemented in a manner to complement proposed water supply projects.

The following sections describe some of the relationships between this Plan and other planning documents within the Region.

13.1 Coordination with Monterey County General Plan

The current General Plan for County of Monterey was adopted in 1982. In 1999, the County began working on an update to the General Plan for current planning conditions in the County. The planning

effort included extensive public outreach and public participation. A Draft General Plan Update and Draft EIR document were produced in 2004, but the update was opposed by several interest groups in the County. In May of 2004, the County Board of Supervisors voted to retain some aspects of the Draft Update and create a new Draft General Plan Update. This extensive effort resulted in an August 2006 General Plan Update Draft. The August 2006 draft addresses all unincorporated areas of the county and considers the general plans of all cities within the county to allow for cooperative planning.

The Water Management Group, Stakeholder Group, and TAC support a collaborative approach with the planning community and provide support and resources where necessary. The General Plan update was the subject of several June 2007 ballot measures. Voters said no to a measure to approve the Supervisor-approved update, but also said no to a measure to repeal the update. It is unclear at this time when or how the General Plan may change and if this IRWMP would be affected.

13.1.1 Dynamics between IRWMP and Monterey County General Plan

The goals described in the August 2006 draft of the Monterey County General Plan Update that apply to water resource management are consistent with the IRWMP goals relating to Water Supply, Water Quality, Flood Protection and Environmental Enhancement. Parts of this Plan will be coordinated with the County in meeting the General Plan goals. The relationships between the IRWMP goals (as outlined in Section 4.1) and General Plan goals are shown in the following paragraphs.

IRWMP Goals - Water Supply and Water Quality

General Plan Goal PS-2: Assure an adequate and safe water supply to meet the county's current and long-term needs.

General Plan Update Goal PS-3: Ensure that new development is assured a long-term sustainable water supply.

IRWMP Goal - Flood Protection

General Plan Update Goal S-2: Reduce the amount of new development in floodplains and for any development that does occur, minimize the risk from flooding and erosion.

General Plan Update Goal S-3: Ensure effective storm drainage and flood control to protect life, property and the environment.

IRWMP Goal - Environmental Enhancement

General Plan Update Goal OS-4: Protect and conserve the quality of coastal, marine and river environments.

General Plan Update Goal OS-5: Conserve natural habitats for native plant and animal species designated as federal or state Threatened or Endangered species and Critical Habitats designated in area plans and promote preservation of these species.

13.1.2 Specific Coordination with Monterey County

Lower Carmel River Flood Control

The Lower Carmel River Restoration and Floodplain Enhancement Project outlined in this Plan is consistent with the 2003 Monterey County Floodplain Management Plan, the Lower Carmel River Flood Control Project Final Report, and County Code "Regulations for Land Use in the Carmel Valley Floodplain".

13.2 Carmel River Watershed Assessment and Action Plan of 2004

The 2004 Carmel River Watershed Assessment identified the most pressing issues in the watershed to be related to water quality, declining water quantity, declining riparian habitat for native species, erosion, excessive sediment transport, infiltration, runoff, and flooding. Along with an assessment, the plan identified specific strategies that, if implemented, could improve the Carmel River as a natural and cultural resource. These strategies were examined very closely in order to develop an educated direction for objective and project prioritization in Chapter 6 and were also used to provide the framework for Water Management Strategy development in Chapter 5.

The Watershed Assessment recognized threatened species that inhabit the Carmel River Watershed. The current adult steelhead population is below historic numbers for the Carmel River. In their assessment of data from the Carmel River, NOAA Fisheries noted a significant positive trend in adult returns over the 1988-2002 period, but opined that the time series was, “too short to infer anything about the underlying dynamical cause of the trend.” The adult run is estimated by MPWMD to be hovering between 5% to 20% of the basin’s capacity. A sharp recovery of the juvenile population since the 1987-91 drought and the strength of the juvenile population compared to other coast-wide, regional and local streams indicates that the population is resilient, robust, and recovering. Although the steelhead population in the Carmel Basin appears to be recovering, a continuing concern remains regarding whether the recovery can persist. The persistence of a positive trend most likely depends on the occurrence of flows that are necessary to complete key phases of the steelhead lifecycle, including upstream migration of spawning adults from the ocean and downstream emigration of smolts to the ocean.

In addition to steelhead, the California red-legged frog is found in many areas of the watershed but not much is known about the population structure.

Erosion, bank instability, and many other sediment contributors have been accelerated by land development for residential and agricultural purposes. The Watershed Assessment identified that proper landscaping and restoration of the riparian-wetland habitat could help to mitigate these impacts.

13.2.1 Watershed Assessment

Information in the Watershed Assessment was utilized in the IRWMP development process to help determine the Regional Priorities and form objectives. The following objectives align closely with the suggestions presented in the Carmel River Watershed Assessment:

- Meet or exceed targets set by the SWRCB Order No. WR 95-10;
- Improve Carmel River water quality for environmental resources and recreational use;
- Develop regional projects and plans necessary to protect existing infrastructure and sensitive habitats from flood damage and erosion resulting from the 100-year event;
- Protect and enhance sensitive species and their habitats in the regional watersheds;
- Minimize adverse effects on biological and cultural resources when implementing strategies and projects.

The following Regional priorities were developed with input from the Carmel River Watershed Assessment:

- Reduce the potential for flooding in the Carmel Valley and the Carmel River Lagoon
- Mitigate storm water runoff throughout the Region
- Promote the steelhead run

13.2.2 Action Plan

Eight Action categories were identified in the Carmel River Action Plan including flows, groundwater, habitat, sedimentation, steelhead, education, public safety, and water quantity. 57 total actions were

recommended, and some of those actions correlate very closely with the outcome of the prioritization process explained in Chapter 6. For example, the Aquifer Storage and Recovery Project for the Seaside Groundwater Basin will have dramatic water quantity implications and will result in improved water resources management in the Carmel River Basin, especially during dry periods, that will reduce strain on riparian vegetation and aquatic habitats in the area. This project will support multiple Actions suggested in the Assessment and Action Plan while at the same time utilizing an array of water management strategies. This project scored well in the prioritization process and was identified in the Action Plan as one of the most effective projects. Described below are other specific Actions identified in the 2004 Assessment that could be implemented through projects in this plan.

Action Plan # CC-2 recommends the Carmel River Watershed Conservancy, in cooperation with local agencies, seek funding for watershed-wide habitat restoration projects including habitat restoration of riparian areas and upland habitat. These recommendations align with IRWMP priorities to promote the steelhead run, eliminate discharges to ASBS, and mitigate storm water runoff in the Carmel Watershed.

Action Plan # Hab-9 encourages agricultural operation, golf courses, and commercial and private residences to use native grasses and riparian vegetation as a buffer to the main stem and tributaries. These Actions will be considered for projects in this IRWMP associated with these land uses.

Action Plan # Sed-6 calls for erosion prevention to reduce sediment deposition throughout the watershed including main tributaries and the main stem. IRWMP priorities to mitigate storm water runoff throughout the Region are a corollary of these recommendations.

The Carmel River Watershed Volunteer Monitoring Program was developed based on Action Plan # SED-4 and FLOW-7. These actions promote the need to monitor sediment transport in concert with surface flow monitoring conducted by the MPWMD and would provide understanding of the locales where erosion and other problems are producing high levels of sediment discharge, as well as other contaminants associated with non-point source pollution, that are entering creeks and the main stem of the river.

13.3 Big Sur Land Trust Carmel River Parkway Vision Plan

The Vision Plan blends professional landscape design principles with new ideas from community members to create a master plan for parkland and trails. The plan was produced by a design team of faculty and graduate students from the Department of Landscape Architecture at California State Polytechnic University, Pomona, through the University's 606 Studio program.

BSLT's vision for the mouth of the Carmel River Valley is to enhance existing parklands by designing a parkway featuring special outdoor places, trails, and educational experiences. Experiencing such a place will punctuate the value of healthy lands and waters as central to our communities and our way of life.

By restoring these parklands and connecting them with a trails network, the mouth of the valley will become an outdoor showcase of nature where the best of the rich and diverse natural resources that grace the mouth of the river can be walked, experienced and enjoyed.

The boundaries of the Vision Plan reach Jacks Peak in the north, Point Lobos to the south, and extend from Carmel State Beach inland, three miles up the Carmel River. Within these boundaries, the plan focuses on five sub-regions:

- 1) [Mouth of the Valley](#)
- 2) [Hatton Canyon](#)
- 3) [Martin Canyon-Jacks Peak](#)
- 4) [The Carmel River Lagoon and Front of Palo Corona](#)
- 5) [Point Lobos Ranch and Reserve](#)
- 6) [The Big South \(the gateway to Big Sur\)](#)

This IRWMP includes the Lower Carmel River and Lagoon Floodplain Restoration and Enhancement Project at the mouth of the Carmel Valley that is consistent with this vision plan.

13.4 2003 Monterey County Floodplain Management Plan

The Monterey County Floodplain Management Plan identifies areas within Carmel Valley that are prone to flooding. In addition to setting a reduction of flooding in Carmel Valley as a Regional Priority, this IRWMP includes the Lower Carmel River and Lagoon Floodplain Restoration and Enhancement Project at the mouth of the Carmel Valley that is consistent with this Monterey County plan.

13.5 California American Water 2006-2010 Urban Water Management Plan

Conservation measures, such as the Water Conservation Retrofit Program described in this IRWMP are consistent with the Urban Water Management Plan for this Region.

13.6 Carmel Valley Master Plan and Carmel River Management Plan

These plans describe policies, requirements, and standards for carrying out activities within the riparian corridor of the Carmel River. A primary goal of the Carmel River Management Plan is the restoration of the steelhead fishery, which is also included as a Regional Priority in this IRWMP. Projects proposed in this IRWMP will be reviewed during the design/permit acquisition phase for conformance with these plans.

13.7 2004 Pacific Grove Sewer System Asset Plan

The purpose of the SSAMP is to provide guidance to the City in the management of the City's sewer system asset. The SSAMP report details 7,616 feet of sewer pipe graded C, D, or F, requiring over \$1.4 million in repair costs (2004 dollars).

In February of 2000, the City of Monterey completed a system study of the sanitary sewer system with televised recordings of all lines and "report card" rating of the pipe conditions. In August of 2001, a pre-design study was completed, taking all of the information from the initial study and putting together 22 rehabilitation projects for the pipes graded in the 'C', 'D', and 'F' categories.

This IRWMP includes the Sanitary Sewer System Repair and Replacement in Cities of Monterey and Pacific Grove Project, which is consistent with the recommendations in SSAMP.

13.8 2006 Carmel River Lagoon Long Term Management Plan

The Carmel River Lagoon Long Term Management Plan summarizes resource management issues and concerns at the Carmel River Lagoon and outlines studies necessary to develop a long term plan to sustain this area. This IRWMP includes the Lower Carmel River and Lagoon Floodplain Restoration and Enhancement Project, which is located at the mouth of the Carmel Valley and is consistent with the goals expressed in the Long Term Management Plan.

13.9 Monterey Regional Storm Water Prevention Program

The Monterey Regional Storm Water Prevention Program (MRSWPP) describes best management practices and a program for reducing impacts from stormwater. Mitigation of effects of storm water runoff throughout the region is a priority in this IRWMP. Projects in the IRWMP to reduce stormwater discharges and/or improve water quality will be reviewed for conformance with the MRSWPP.

13.10 2007 MPWMD Strategic Plan

The MPWMD strategic plan includes the following three-years goals that are applicable to projects in this IRWMP:

- Establish respectful and effective relationships among the District, public, CAW, jurisdictions and the Watermaster
- Determine and participate in long-term water supply solution(s)
- Complete ASR Phase 1 and expanded ASR Project(s)
- Enhance and protect the water resources of the Carmel River and the Seaside Ground Water Basin for the benefit of the environment and the community

With the exception of projects involving sanitary sewer improvements, which are not within the mission of MPWMD, all the projects in this IRWMP are consistent with MPWMD's three-year goals.

13.11 Seaside Groundwater Basin Final Statement of Decision, and Seaside Groundwater Basin Monitoring and Management Plan

These two documents provide direction to local entities in resolving the overdraft problem in the Seaside Groundwater Basin (SGB). One of the Regional priorities in this IRWMP is to support the Seaside Groundwater Basin Watermaster to implement the physical solution in the Basin. The four projects proposed in this IRWMP for the SGB to improve water quality in the basin aquifers, create a sustainable water supply for the Region, and reduce dependence on the Carmel River Basin are consistent with the Final Statement of Decision and the Seaside Groundwater Basin Monitoring and Management Plan.

13.12 Monterey Bay Draft Management Plan, October 2006

The Draft Management Plans (DMP) for the Cordell Bank, Gulf of the Farallones and Monterey Bay National Marine Sanctuaries focus on key issues and opportunities affecting the three sanctuaries. The draft plans contain information about each sanctuary's environment, priority management issues and actions proposed to address them, regulations, staffing and administration, operational and programmatic costs, and performance measures. They address important sanctuary programs such as public awareness and understanding, conservation science, water quality, emergency response and enforcement, and maritime heritage. The draft plans, released in October 2006, represent a major revision of each site's original management plan and are the result of several years of study, planning, and extensive public input.

This management plan includes twenty-five action plans guiding the Sanctuary for the next five years. The majority of the action plans are grouped into four main marine management themes: coastal development, ecosystem protection, water quality, and wildlife disturbance. Two additional sections, partnerships and opportunities as well as operations and administration, comprise action plans and strategies addressing how the Sanctuary will function and operate. Finally, five cross-cutting plans will be implemented in conjunction with the other two sanctuaries.

Representatives of the MBNMS worked with IRWMP participants to develop strategies and objectives in this Plan. It is anticipated that there will be continued cooperation between the MBNMS and IRWMP participants in project development and implementation.

Chapter 14 Stakeholder Involvement and Coordination

IRWM Standards N and O

This section identifies how stakeholders were identified, how they participate in planning and implementation efforts and how they can influence decisions made regarding water management. Included in this section is documentation of stakeholder involvement by means of letters of support from non-agency stakeholders. Included is a discussion of:

- mechanisms and processes that have been and will be used to facilitate stakeholder involvement and communication during implementation,
- watershed or other partnerships developed during the planning process,
- disadvantaged communities within the region and their involvement in the planning process,
- efforts to identify and address environmental justice needs and issues within the region, and
- possible obstacles to implementation.

This section also identifies State or Federal agencies involved with strategies, actions, and projects.

14.1 Outreach for IRWMP

The water management process has fully integrated key stakeholders throughout its development. Along with the Water Management Group, the following stakeholders were identified and invited to be involved in the planning process.

Table 14-1: Stakeholders

California American Water	Monterey Bay National Marine Sanctuary
California Coastal Commission	Monterey Bay Citizen Watershed Monitoring Network
California Coastal Conservancy	Monterey County Resources Conservation District
California Department of Fish and Game	Monterey County Service Area 50
California State University Monterey Bay	Monterey Peninsula Regional Park District
California State Water Resources Control Board	NOAA Fisheries
Carmel Area Wastewater District	Pebble Beach Community Service District
Carmel River Steelhead Association	Pebble Beach Company
Carmel River Watershed Conservancy	Regional Water Quality Control Board
Carmel Unified School District	Seaside Basin Watermaster
Carmel Valley Association	State Department of Parks & Recreation
City of Carmel-by-the-Sea	Surfrider Foundation
City of Del Rey Oaks	The Nature Conservancy
City of Pacific Grove	The Watershed Institute at CSUMB
City of Sand City	U.S. Army Corps of Engineers
City of Seaside	U.S. Fish and Wildlife Service

14.2 Stakeholder Processes

The participating entities in the Water Management Group, members of the Technical Advisory Committee, and stakeholders involved in the development of the IRWMP continue to identify groups, individuals, entities and other stakeholders who can benefit from participating in the IRWMP. Prior to

adoption of the Final IRWMP, an outreach effort is proposed for areas that have not participated in plan development. Outreach may consist of advertisements, public notices, and public workshops.

14.3 Project Specific Outreach

Projects included in the Final IRWMP may contain outreach efforts. See individual project descriptions in Section 7.1 Projects and Programs for IRWMP Implementation for additional details.

14.4 Environmental Justice and Disadvantaged Communities

As described in Section 8.3, there are only four census tracts in the Region that could qualify as disadvantaged communities. The majority of communities in the Region have Median Household Income that is higher than the State average, and therefore no disadvantaged communities can be impacted.

Environmental justice is addressed by ensuring that all stakeholders have access to the decision-making process and that minority and/or low-income populations do not bear disproportionately high and adverse human health or environmental impacts. Although only four census tracts in the Region qualify as disadvantaged communities, increases in water or wastewater service rates that could accompany the implementation of several projects discussed herein may potentially affect these communities.

MPWMD coordinated a meeting of the Carmel River Advisory Committee in Cachagua Valley in September 2007 to solicit input on problems and issues in that sub-watershed. Based on input at the meeting, issues in this sub-watershed include the need for more water conservation measures, a lack of an existing central group or governing structure in Cachagua Valley that might be able to carry out watershed management planning, and the need to improve the water supply to meet demand during drought conditions.

A priority of the Region is to seek external grant funding or subventions to offset the cost of implementing new, and often expensive, projects. External funding assistance will help offset costs to existing rate payers in the region, especially those rate payers with a limited ability to pay, and help ensure that those rate payers are affected as little as possible. Additionally, the projects contained herein will be reviewed for compliance with CEQA, NEPA, and any other local, state, and federal requirements. Through any necessary environmental documentation review, compliance with Executive Order 12898 will be addressed as applicable to a specific project.

14.5 Coordination

The Water Management Group, stakeholders, and TAC have conducted coordination with state and federal agencies during the development of many of the supporting documents to this IRWMP. It is expected that this will continue with the development of individual projects that are consistent with this Plan. In addition, state and federal agencies will be notified of the completion of the Final IRWMP.

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